Exploring the non-technical challenges:

A case study of identity and access management projects

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Exploring the non-technical challenges:
A case study of identity and access management projects

by

Pontus Engström
Utforska de icke-tekniska utmaningarna:
En fallstudie av identitets- och åtkomsthanterings projekt

av

Pontus Engström
Abstract
The implementation of an Identity and Access Management (IAM) solution is a complex process to manage, consuming multiple years and involves organizational changes. In its nature, several challenges tend to appear to different stakeholders involved in the process. However, prior research has mainly addressed the technical components of an IAM-solution, hence the technical challenges that emerge during development and implementation. Therefore, the non-technical challenges of the IAM-project work and the challenges that constitute the client implementation are understudied. The purpose of this thesis is to visualize the challenges that emerge when an IAM-solution is implemented. In addition, the challenges when organizational changes occur. The empirical data is conducted through a series of semi-structured interviews with individuals in the IAM line of business. In addition, secondary data is gathered through the review of papers and reports in Information Systems (IS) and Information Technology (IT) projects and outsourcing projects, as well from a non-academical organization with in-depth knowledge of IAM implementations. A qualitative case study of IAM implementations was conducted to investigate the studied complex phenomenon. The findings display the challenges of Insight, Communication, and Endurance (ICE), which tend to be obstacles for all stakeholders involved. Additionally, the organizational changes describe three further challenges of Anchoring, Communication, and Vision (ACV). These challenges mainly appear in client changes, which IAM implementations initiate. The thesis display connections and incoherent with prior research on IS/IT-projects and IAM-projects. In addition, newly uncovered aspects that contribute to research areas are highlighted. The thesis is summarized with some implications and possibilities for future research.

Keywords: IAM-project, IS/IT project, project management, organizational change, challenges
Sammanfattning

Nyckelord: IAM projekt, IS/IT projekt, projektledning, organisatoriska förändringar, utmaningar
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### III. Acronyms and Abbreviations
Notable acronyms and abbreviations that frequently appear in the thesis.

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<tr>
<th>Acronym</th>
<th>Definition</th>
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</thead>
<tbody>
<tr>
<td>ABAC</td>
<td>Attribute-Based Access Control</td>
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<tr>
<td>AC</td>
<td>Access Control</td>
</tr>
<tr>
<td>ACL</td>
<td>Access Control List</td>
</tr>
<tr>
<td>ACV</td>
<td>Anchoring-Communication-Vision</td>
</tr>
<tr>
<td>AD</td>
<td>Active Directory</td>
</tr>
<tr>
<td>CIAM</td>
<td>Centralized end-to-end IAM</td>
</tr>
<tr>
<td>DAC</td>
<td>Discretionary Access Control</td>
</tr>
<tr>
<td>HR</td>
<td>Human Resources</td>
</tr>
<tr>
<td>IAM</td>
<td>Identity and Access Management</td>
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<tr>
<td>ICE</td>
<td>Insight-Communication-Endurance</td>
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<tr>
<td>IdM</td>
<td>Identity Management</td>
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<tr>
<td>IdMS</td>
<td>Identity Management System</td>
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<tr>
<td>IdP</td>
<td>Identity Provider</td>
</tr>
<tr>
<td>IGA</td>
<td>Identity Governance and Administration</td>
</tr>
<tr>
<td>IS</td>
<td>Information Systems</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>KTH</td>
<td>KTH Royal Institute of Technology</td>
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<tr>
<td>MAC</td>
<td>Mandatory Access Control</td>
</tr>
<tr>
<td>PMI</td>
<td>Project Management Institute</td>
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<tr>
<td>RBAC</td>
<td>Role-Based Access Control</td>
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<tr>
<td>SOX</td>
<td>Sarbanes-Oxley Act</td>
</tr>
<tr>
<td>SP</td>
<td>Service Provider</td>
</tr>
<tr>
<td>SSO</td>
<td>Single-Sign On</td>
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<tr>
<td>SU</td>
<td>Stockholm University</td>
</tr>
<tr>
<td>URL</td>
<td>Uniform Resource Locator</td>
</tr>
<tr>
<td>UU</td>
<td>Uppsala University</td>
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</table>
## IV. Glossary

Notable terms that appear in the thesis.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access Control</td>
<td>Access control is a security technique that regulates how an individual or entity can view or use resources in a computing environment.</td>
</tr>
<tr>
<td>Attribute-based AC</td>
<td>Access control based on real-time attributes. This method increases security by determining when (time), where (location), and how (domain) a user is trying to access information.</td>
</tr>
<tr>
<td>Authentication</td>
<td>The process that checks user/login credentials to verify an identity: is the person really the one he/she claims to be.</td>
</tr>
<tr>
<td>Authorization</td>
<td>This function uses pre-defined rules which are assigned to users. For example, Alice is only authorized to read (view) certain documents, but not to edit, delete or create new content. Authorization is also to determine if the user is authorized to access the service before trying to access targeted resources.</td>
</tr>
<tr>
<td>Business entity</td>
<td>In this thesis, a business entity is referring to an entity or department inside a company. One example could be HR or IT. However, a business entity could be any actor that is working isolated from other departments, where its operations benefit the focal company.</td>
</tr>
<tr>
<td>Client</td>
<td>In this thesis, a Client is an actor - usually a company or organization, that has signed a contract with another actor - usually a Contractor, with expectations to receive a roadmap or solution to their current problem.</td>
</tr>
<tr>
<td>Contractor</td>
<td>In this thesis, a Contractor is an actor - usually a consultancy firm, that possesses knowledge in how to deliver a certain solution, or guidance, to a Client.</td>
</tr>
<tr>
<td>Least privilege access principle</td>
<td>Giving a user, or process, the least amount of privilege to perform its intended work or function.</td>
</tr>
<tr>
<td>Master data</td>
<td>Master data represents the business objects that contain some of the most valuable information, which is shared across an organization. It emphasizes the focus of the IT discipline of master data management.</td>
</tr>
<tr>
<td>Provisioning</td>
<td>The automation of all steps required to manage user or system access entitlements or data relative to electronically published services</td>
</tr>
<tr>
<td>Role-based AC</td>
<td>Currently the facto standard of access control. It groups identities, or accounts, and permissions together to roles.</td>
</tr>
<tr>
<td>Single-Sign On (SSO)</td>
<td>Computer systems using the SSO technique relies on a single user ID and password to determine the users access privileges. When a user has been authorized, it may access multiple software systems during this single sign on.</td>
</tr>
</tbody>
</table>
V. Foreword
I would like to dedicate this section to everyone that has contributed to the result of this thesis. Firstly, I want to thank the consultancy firm (Knowit Secure AB) that guided me through this challenge – mostly my corporate supervisor Tomas Rimming. Secondly, I want to thank my supervisor Emrah Karakaya at KTH. Without his experience and knowledge, the outcome of this thesis would not have reached this level. Additionally, I’m very grateful of all interviewees that took their time to answer my complex and occasionally vague questions – after all, IAM was more multidimensional than I anticipated. Finally, without family and friends, this type of work would barely have been feasible. Without their constant support and love, I would not have created and achieved this master thesis.

For those of you that I have not mentioned – thank you! This thesis has been influenced by so many individuals with endless knowledge. Hopefully, I can spread my knowledge to future academic work.

Pontus Engström
Stockholm, June 2019
1. Introduction

This chapter introduces the thesis and corresponding subject areas. Section 1.1 presents a brief background that emphasizes Identity Management (IdM), Access Control (AC), and the concept of Identity and Access Management (IAM). Additionally, the problem statement – challenges – with IAM implementations are presented. Section 1.2 expresses the purpose and research questions. Section 1.3 presents the thesis contribution to research and its delimitations. The last section 1.4 presents an outline of the thesis, to highlight the structure of the study.

1.1 Background

In a rapid evolution of inventions and technologies, the era of digitization is hard to neglect for anyone living in these hectic times. The rise of computer technology and, later, the Internet have created immense business opportunities for organizations. The latter has radically changed the way people search and share information. The continued growth of the global population, improved technologies, and data generation has led to organizations demand of creating, or enrolling, user accounts. Creating user accounts serve many purposes, where one is to facilitate the managing of identities, thus improve the user experience but also to enhance the corporate identity management and security of those. Furthermore, to increase efficiency in for example on- and off boarding of employees. Currently, one of the hottest topics is to ensure company compliance, thus security aspects are of high corporate value. Nevertheless, an account contains attributes linked to an identity or entity. User credentials – username, password, key, etc. – are a common method to verify authority, to gain access to a computer system and the linked account privileges of resources.

With the increasing amount of accounts, and how to manage them in a secure matter, it becomes of great value for organizations to facilitate the setup and handling of identities and accounts. Additionally, to ensure that all users comply with internal and external regulations. In the end, it is of the highest value for organizations to ensure “the right individuals to access the right resources at the right time for the right reasons”.

In the early 2000s, several large corporate frauds occurred (e.g. Enron and WorldCom) expressing conflicts of interest and incentive compensation practices. These frauds ended with corporate bankruptcy and investors losing billions of dollars (Farrell, 2005). As a response, the U.S. Congress issued the Sarbanes-Oxley (SOX) act in 2002, with a purpose to protect investors by improving the accuracy and reliability of corporate disclosures made pursuant to the securities laws, and for other purposes. This act, together with a few other (Basel II, Basel III), pushed for governments and organizations compliance (Hummer et al., 2016). Therefore, many organizations have, over time, realized the need to fulfill these requirements. Except for organizational compliance, the personnel that constitutes the organization must as well comply to external, and internal, regulations, to ensure that the entire organization has high compliance with current and future regulations. This challenge emphasizes the need to monitor and manage employees’ identities, and to ensure that they can only perform actions – access resources – needed to perform their daily work. Standardized processes, policies, and guidelines are necessary to ensure high security and suitable compliance. Therefore, to address these challenges, the concept of IAM\(^2\) has increased in popularity for many corporations. Nevertheless, IAM implementations tend to be quite long spun and demanding, hence many corporations experience difficulties to implement it and to be able to utilize its full capacity.

---

\(^2\) IAM is constituted by underlying concepts like Identity Management and Access Control (other concepts exist as well). However, these technical components have been limited in this thesis because of its focus on stakeholders’ challenges in IAM implementation.
IAM\(^2\) has become a main challenge for most companies to fully manage over the latest decades (Kunz et al., 2019). The efficient administration of employee’s access to sensitive applications and data is one of the biggest security challenges for many organizations in today’s digital world (Hummer et al., 2016). To ensure proper authentication of users, devices or services, as well to determine to either granting or denying access to data or other system resources, these concerns are one of the main purposes by implementing an IAM solution (Indu, Anand and Bhaskar, 2018). IAM confirms that the same identity is used and managed for all heterogeneous technology environments and applications, and ensures high security. However, users tend to accumulate excessive access rights over time, mainly because of ineffective and application-specific user management (Hummer et al., 2016). This entails that most users are overprivileged, thus their required privilege, or permission, to perform daily tasks exceeds the required one. Another aspect, adding to the problem, is that organizational guidelines and policies can hardly be enforced in a decentralized organizational environment (Hummer et al., 2016). IAM is a key component to an organizations Information Technology (IT) infrastructure (Bradford, Earp and Grabski, 2014). It comprises traditional security measures and can be automated to improve efficiency and effectiveness. An IAM system ensures that internal and external user accesses comply with regulations, but also improve internal control (Bradford, Earp and Grabski, 2014). Because of the requirements of regulatory compliance and improved automation, mainly medium-sized and large organizations operate standardized IAM systems (Kunz et al., 2019). Large organizations could manage millions of user access privileges across thousands of IT resources (Hummer et al., 2016). The IAM concept aims to create a centralized system where most underlying company systems are integrated. This way, it can be called a centralized end-to-end IAM infrastructure (CIAM), with the purpose to increase automatization and security features (Bradford, Earp and Grabski, 2014). The centralized system refers to a system that is well documented and managed through a single implementation tool. This type of infrastructure strengthens IT governance in organizations since consistent principles and policies are clearly stated and applied in all business systems (Bradford, Earp and Grabski, 2014).

IAM implementations are interrelated to IT-projects, which has a well-known history of failure in its execution (Charette, 2005; Alami, 2016). The implementation stage of an IAM is very costly, time-consuming to create and maintain, where some organizations fail to successfully implement it (She and Thuraisingham, 2007). A full-scale implementation across all key corporate components can easily consume multiple years, involving organizational change, process engineering, and numerous technology components (Everett, 2011; Osmanoglu, 2014). In addition, one reason for the time consumption is the vast amount of legacy systems within the client company (Everett, 2011). Bruhn, Gettes and West (2003) expressed their challenges when implementing an IAM for an institution, where the implementation was quite complex. They stated that the project team must consider a variety of policy, operational and technical decisions to ensure that an individual’s privacy is in balance with institutional security. Nevertheless, the element of organizational change is commonly a poorly defined process, or totally undefined, which hinder the adoption of processes and technology changes (Everett, 2011; Osmanoglu, 2014). Furthermore, an organization that aims to implement an IAM solution face long, complex implementation process, especially in large organizations, and must create new policies and procedures to use and follow, and maintain in these security systems (Bradford, Earp and Grabski, 2014). Usually, before an IAM implementation, the organization already have an existing software package – e.g., an identity

\(^2\) The concept of Identity Governance and Administration (IGA) is also included in the IAM framework, however, excluded in this master thesis.
management tool, hence developing the IAM solution from scratch is not always necessary (Osmangolu, 2014). Lastly, organizational changes and technology changes – IAM implementations, are interconnected in an organization (Gerbec, 2017). Therefore, changes should be managed in an integrated way.

The thesis tries to address the most common issues with IAM implementations, and challenges, the IAM-project team and the client company must tackle. Additionally, emphasize the process of change that emerge inside the client company when this type of project is initiated. A lot of research and literature have investigated the technical components, which IAM is based on, and the technical implementation. However, not that many have addressed difficulties with IAM implementations from the project team’s perspective or the client.

1.2 Purpose and Research Questions
The purpose of this thesis is to investigate challenges, both common ones that normally occur in an IAM implementation – project management challenges, but also challenges in the process of change inside the client company during an IAM implementation – organizational change challenges. In the extent literature, challenges that emerge in IAM-projects when an IAM solution is implemented to a client company are understudied. The expectation is to fill this lack of knowledge or at least address some concepts that have not been clearly defined up to this moment. The results should describe possible pitfalls in the implementation process, thus hopefully indicate proactive actions to enhance future IAM implementations. To address this lack of knowledge, the following research questions have been developed:

**RQ1:** Why do challenges emerge when an Identity and Access Management solution is implemented?

**RQ2:** What challenges arise in the change process that an Identity and Access Management implementation create inside a client company?

These research questions are addressed by conducting a case study on IAM implementations, and the challenges that appear from multiple stakeholders’ perspective.

1.3 Contribution and Delimitations
This thesis intends to expand the knowledge in both common challenges in IAM implementations, and the change of process inside organizations when an IAM solution is implemented. By doing so, it attempts to contribute to the literature on IS/IT project implementation, e.g. Fitzgerald (1998) and Willcocks and Feeny (2006). Although IAM-projects have been of high importance for organizational transformation in a number of sectors over the last few decades (Everett, 2011), such projects have not received much attention in the extent literature. This thesis brings forward a qualitative case study (Yin, 2003) on IAM-projects and, in turn, provides some insights on this understudied empirical context.

The thesis is delimited to IAM implementations and challenges that arise for the participating stakeholders – contractor, client, and project team (occasionally, a product supplier is added into the project constellation). There is a special emphasis on non-technical challenges since the technical challenges are assumed to be less significant. The case study considers the companies operating in the Swedish market, both private and public ones. Although some respondents could have experience from cases outside the Swedish nation, the thesis is anchored in the context of Swedish IAM-projects. However, it can be argued that the findings could be relevant for similar
cases in other countries with similar technical environment and culture (e.g., Scandinavia or other Nordic countries).

1.4 Thesis Outline
The thesis is introduced by Chapter one. It displays the background and problematization and further emphasizes the purpose and aim. Additionally, the contribution to research and its delimitation is displayed. Chapter two describes a technical background, emphasizing the definition of an identity which is a core aspect in IAM, as well as to many other areas and constellations. The chapter further display models of identity management and access control, which are some of the most essential aspects of IAM. The purpose is to inform the reader about the fundamental principles of the IAM technologies, which is advantageously to fully understand the empirical findings, discussion, and conclusions of the thesis. Chapter three presents a literature review, mainly emphasizing project management and the challenges that emerge in areas – one step higher in the abstraction level – of IS/IT and outsourcing projects. The prior literature, although not specifically in the IAM area, connects to challenges within IAM-projects. Chapter four presents the methodology used to conduct the empirical findings. It aims to clearly display how and why the research has been conducted in a certain way. The chapter elaborates on the research design, data collection, data analysis, research quality, research ethics, and sustainability. Chapter five presents the empirical findings. The aim is to visualize the conducted data in a systematic and clear way. The analysis is performed by a thematic analysis approach, hence themes are generated through categories and codes. Chapter six presents the discussion and the connections and disconnections with prior research in the IS/IT project field. Chapter seven sum up the thesis with a conclusion. It focuses on industrial and academic implications, and some further research.
2. Technical Background

This chapter introduces some technical literature which addresses some concepts in the IAM architecture. These concepts are briefly described, mainly to give some first insights of what IAM is based on. However, because of this master thesis scope, concepts of Identity Management and Access Control are only addressed. Section 2.1 presents the definition of an identity, which is the foundation of any Identity Management system. Section 2.2 emphasizes some concepts and methods of Identity Management. The last section 2.3 displays some common methods of Access Control.

2.1 Identity

The ancient Greek philosopher Aristotle, together with Plato, is considered the father of western philosophy. Aristotle’s logic Law of Identity was first formalized as: “each thing is identical with itself”. Together with the Law of (non-) Contradiction and Law of Excluded Middle, the so-called laws of thought, conclusions could be made where identity is an equivalence relation with characteristics of reflexive, symmetric and transitive properties (Zhu and Badr, 2018). The separate characteristics could be described as:

**Reflexive:** \( a = a \)

**Symmetric:** if \( a = b \), then \( b = a \)

**Transitive:** if \( a = b \) and \( b = c \), then \( a = c \)

In logic, each law displayed a certain ability. To express them as accurate as possible, the classical propositional calculus is a suitable method (Huth and Ryan, 2004). Together with logical connectives they deal with propositions (either true or false) and argument flow. Logical connectives are found in natural languages e.g. in English, and some examples are: **and** (conjunction), **or** (disjunction) and **not** (negation) (Huth and Ryan, 2004). Based on this framework, each law could be explained as:

**Law of Identity:** \( a = a \)

**Law of (non-) Contradiction:** \( \neg (a \land \neg a) \)

**Law of Excluded Middle:** \( a \lor \neg a \)

Many centuries later, the German philosopher Wilhelm Gottfried Leibniz developed the Leibniz’s Law, also known as Identity of Indiscernible (The Stanford Encyclopedia of Philosophy, 2016), where he expressed “No two objects have exactly the same properties”. Based on this, two principles were developed to distinguish two different individuals in the physical world and the cyberspace of the internet, because of intuitive and simple recognition (Zhu and Badr, 2018). These principles are expressed as:

**Principle 1 – Indiscernibility of Identicals:**

For any \( x \) and \( y \), if \( x \) is identical to \( y \), then \( x \) and \( y \) have all the same properties:

\[
\forall x \forall y [ x = y \rightarrow \forall P (Px \leftrightarrow Py)]
\]

**Principle 2 – Identity of Indiscernibles:**

For any \( x \) and \( y \), if \( x \) and \( y \) have all the same properties, then \( x \) is identical to \( y \):

\[
\forall x \forall y [\forall P (Px \leftrightarrow Py) \rightarrow x = y]
\]

Today, Leibniz’s Law is the underlying principle which most identity management tools in the cyberspace utilize. Identities are defined by attributes, or identifiers, where credentials are the
authentication method. The law itself has been questioned, e.g. by the Ship of Theseus paradox – if a ship that has all of its components (planks, beams, etc.) replaced remains fundamentally the same object (Smart, 1972). This questioning display that the law is not applicable in all scenarios and contexts (Cao and Yang, 2010; Zhu and Badr, 2018).

In today’s digital era, an identity can be defined as something or someone, with corresponding attributes or identifiers, to distinguish it from everyone else – uniqueness (Bruhn, Gettes and West, 2003; Hovav and Berger, 2009). However, the same person or the same organization can have different identities depending on contexts, where each identity is reflected by the different set of identifiers, see Figure 1. The so-called digital identity³ has increased popularity, due to the digitization and the Internet phenomenon. Depending on what the identity will be used for the required identifiers might vary, e.g. creating an account on a webpage compared to issuing a new passport at a government authority will have some differences. Identifiers can either be acquired, e.g., name, address, nationality, registration number, memberships, etc., or inherent as biometrics (Josang et al., 2005). Biometrics emphasize the biological or behavioral characteristics of an individual. The biological, also known as the physical security mechanism (Indu, Anand and Bhaskar, 2018), are mainly: fingerprinting, iris/retinal and face recognition, where the behavioral are distinguished patterns in, e.g., walking, voice and handwriting (Jain, Bolle and Pankanti, 2006). These physical attributes, linked to an identity, together with other digital security mechanisms constitute the authentication process (Indu, Anand and Bhaskar, 2018). This vital process is commonly used in network environments where other methods like log-on credentials, multifactor authentication, third-party authentication, simple text passwords, biometric authentication, and digital device authentication, are the most notable ones (Indu, Anand and Bhaskar, 2018).

As Figure 1 depicture, the set of identifiers is larger than the set of identities, which is larger than the set of persons or organizations. The unique subset of identifiers can be seen as a proper description of an identity, whereas the person could have different identities depending on the

³ From this point, identity is referring to digital identity
context (Jøsang et al., 2005). As a practical example, the unique identifiers could be chosen as an account name or number (e.g. employee number). Sometimes, that is enough to identify the object, however, the increased number of identifiers typically indicate higher security which comes at a higher cost. Lastly, to express its importance, the namespace for identifiers must be carefully chosen, this to guarantee a unique mapping of each identity to a single specific entity (Jøsang et al., 2005).

The identifying process, which appears in the physical world, can be described as (Bruhn, Gettes and West, 2003; Hovav and Berger, 2009):

1. What you know – such as attributes, or identifiers, that are well-known for the person, e.g. address, age, social security number, or items/tokens that are verifiable to a physical record like a driving license or a passport. Another core attribute is passwords that, presumably, is well-known by the individual. However, the creation and usage of passwords is a thesis by itself, hence passwords will not be specifically investigated.
2. What you have – such as tokens or things that are acquired by the individual. It could be a physical passport, driving license, credit card, physical key, or other token used in the authentication process.
3. What you are – such as the height, weight, hair, eye color, or other biometrics like fingerprint and retina pattern.

The described process is necessary for the authentication process, which determines if the individual is who it claims to be.

2.2 Identity Management

One technology, or method, that has increased in popularity and evolved in the latest three decades is identity management (Zhu and Badr, 2018). The evolution phase has gone through the initial isolated model approach, to a centralized model and lastly a federated model. One of the main purposes of using identity management tools is to facilitate the user experience and account management for service providers, where its definition could be expressed as the system and framework used in computer systems to control identity (Dabrowski and Pacyna, 2008). However, the definition of identity management varies depending on the author and context (Cao and Yang, 2010). Some common operations that an identity management system executes to manage identity information (usually set to an account) are register, update, revoke and look-up (Zhu et al., 2017). Identity models have a wide variation thus the most suitable model depends on the context and how it should be used. Typically, the component of trust is a critical link between clients and service providers (or identity providers), therefore, the trust level should be chosen wisely (Jøsang et al., 2005; Dabrowski and Pacyna, 2008).

Traditional identity management systems, used over online platforms have the main responsibility to manage user’s identity information, consisting of identifiers (UserID, URL, email, etc.), credentials (certificates, tokens, biometrics, etc.) and attributes (roles, positions, privileges, etc.) (Telecommunication Standardization Sector of ITU, 2009). In a traditional identity management system, three main stakeholders constitute the system: the subject or user, the relying party or Service Provider (SP), and the Identity Provider (IdP) (Zhu and Badr, 2018). Despite their different functionality, they are interdependent. Initially, the user requests access to some service from the service provider, which redirect the user to an identity provider, where the user’s identity is challenged by the authentication protocol, see Figure 2. However, the model structure depends on what method it uses.
There exist several methods and versions of identity management systems, where some worth mentioning are Isolated Identity Management, Federated Identity Management, and Centralized Identity Management (Jøsang et al., 2005).

**Isolated Identity Management**

The isolated identity management, sometimes known as the Silo approach (Hovav and Berger, 2009), is a very common identity management model, where the service provider act as both credential- and identifier provider (Jøsang and Pope, 2005; Cao and Yang, 2010). The service provider decides the namespace and what identifiers that should be linked to the user. Additionally, identity allocation, deletion, modification, authentication, and authorization are solely implemented in the service provider (Cao and Yang, 2010). Nevertheless, the user must create separate credentials for each service provider it interacts with, which create an unsustainable user experience (Jøsang et al., 2005).

**Centralized Identity Management**

The centralized identity management introduces an independent and legal entity called identity provider (Dabrowski and Pacyna, 2008), which issues and manage identifier (attributes) and credentials domains. Additionally, it controls identity management aspects for all services within its own domain. This entity can be called the central one since each service provider must interact with it to ensure that a user fulfills the authentication process. This usage of an identity provider facilitates the user experience since the user can use the same type of identifiers and credentials to access different domains (Jøsang and Pope, 2005).

**Federated Identity Management**

The federated identity management has gained some attraction and is very appreciated by several enterprises (El Maliki and Seigneur, 2007). It addresses the unsustainable user experience in the isolated user identity management (Jøsang and Pope, 2005). However, it uses the same underlying basics as the isolated model where each service is entitled to create an identity for an entity. The
The main difference is the federated capability to provide cross-domain linking of identities from different services to achieve the so-called federated identity (Dabrowski and Pacyna, 2008). This linking is defined as sets of agreements, standards, and technologies that enable a group of service providers to recognize identifiers and entitlements from other service providers within the federated domain (Jøsang and Pope, 2005). To ensure that the user has been properly authorized and authenticated, assertions are passed between the service providers (Jøsang and Pope, 2005). This model, like the centralized model, increases the user experience where only one set of identifiers and credentials are necessary to access several domains within the federated domain.

The main difference between the centralized model and the federated model is that the federated one does not use the same identity provider, and that the centralized model requires all users to be from the same domain (Cao and Yang, 2010). To illustrate the federated model, a few institutions want to collaborate, e.g. KTH Royal Institute of Technology (KTH) – SP 1, Uppsala University (UU) – SP 2, and Stockholm University (SU) – SP 3, where they want to share academical information with each other. A student from KTH, registered and its identity created by the KTH domain, are allowed access to both UU and SU although the student is not registered for that specific university. This entails immense advantages, however, the service providers agreement of policies, standards, and technologies are vital for establishing a suitable trust level to maintain an adequate security level.

2.3 Access Control

The process of access control is to verify if an identity, or entity, requesting access to a resource has the needed privilege (Mammass and Ghadi, 2014; Zhu and Badr, 2018). Access controls constraints the user’s privileges, also what programs executing on behalf of the users can do. The aim of access control is to prevent activity that could lead to e.g. security breaches (Sandhu and Samarati, 1994). Whenever an identity has been authenticated to a system, it will try to fetch, or access, some objects with information, see Figure 3. Access control assumes that authentication of the user has been properly performed and successfully verified. The effectiveness of the access control rests on a proper user identification process and on the correctness of the authorizations governing the reference monitor (Sandhu and Samarati, 1994). Whenever a user is trying to reach information, the system will execute an access control, to check the user’s permissions and competences, to either accept or deny access. This is set by the owner of the information since the owner is the one that has authority to establish policies that describes what operations may be performed on those objects, by whom, and in what context (Hu et al., 2014). There are cases when the owner is either required to enforce a policy imposed upon them by higher authorities – also known as Mandatory Access Control (MAC), or have the discretion to set policies themselves and can forward this authority to others – also known as Discretionary Access Control (DAC) (Hu et al., 2014; Indu, Anand and Bhaskar, 2018). Nevertheless, depending on the context, different access control methods exist. In the following section, the fundamentals of Access Control List (ACL), Role-based Access Control (RBAC), and Attribute-based Access Control (ABAC) will be described.
Access Control List
The ACL is one of the most basic methods of access control. Mainly, it is a list of predefined rules, which describes permissions to a specific object (e.g. document). In its simplest form, it could be defined as a list with subjects (e.g. individuals), each linked to a set of objects with corresponding access mode or privilege. One example could be that Bob owns object file 1, thus has full authority to read and write the document (other privileges could be added). Alice, another subject in the computer system, has only the access mode to read object file 1 because Bob has set that access control rule to Alice (Sandhu and Samarati, 1994; Hu et al., 2014). This primitive method is commonly used in e.g. computer networking to monitor the traffic of IP packets and determine filtering rules (Sayama and Yoshiura, 2012). However, ACLs has difficulties to enforce the least privilege access principle – a subject should only have the needed permission, or privilege, to perform its requested operation (daily work).

Role-based Access Control
Another well-known access control model, pioneered in the early 1970s, is the RBAC. RBAC is commonly used as the access control mechanism in IAM solutions (Kunz et al., 2019). The common notion of RBAC is that permissions are associated, or linked, with roles – not individuals, and users are assigned to suitable roles (Sandhu, 1998; Mammass and Ghadi, 2014). Inside an organization, roles are created to define the variation in job functions. Depending on the user's actions and responsibilities, associated with working activities, roles must be appropriately assigned (Sandhu and Samarati, 1994). Reassignment of roles is a core feature, where adjustments of role permissions could occur when new applications and systems are incorporated (Sandhu, 1998). The definition of a role can have different motivations. A role can represent a competence such as a physician or a pharmacist (Sandhu, 1998). It can also enclose authority and responsibility like a project supervisor. However, competence differs from authority and responsibility; Alice may possess the competence to head several departments but is only assigned to head one. Roles should also reflect the specific duty assignment that is rotated through several users, such as a shift manager (Sandhu, 1998). Another well-used concept in RBAC is groups. A group is typically defined as a

Figure 3: Access control of a user and other security services
collection of users with a given set of permissions assigned to the group, and transitively to all users inside the group. The main difference between roles and groups is that groups are typically treated as a collection of users and a role as a collection of permissions (Sandhu, 1998). Furthermore, usually, roles implement a MAC mechanism, where users cannot assign themselves to roles, someone with higher authority must perform it. RBAC also lack the enforcement of least privilege access principle, as mentioned with ACL. The flexibility and easy to use rights delegation is also a concern, with a substantial management overhead (Gusmeroli, Piccione and Rotondi, 2013).

**Attribute-based Access Control**

One model, a bit newer than the previous mentioned, is Attribute-based Access Control (ABAC). It is a logical access control model that distinguishes from the other access control models, mainly because it controls access to objects by evaluating rules against the attributes of both subjects and objects, and the environment when performing a request (Hu et al., 2014; Hu, Kuhn and Ferraiolo, 2015; Kunz et al., 2019). Anything that has the property to be defined and to which a value can be assigned, it fulfills the requirement of an attribute. Correctly maintained attributes do not only simplify entitlement provisioning, but also support the discovery of violations of the least privilege principle (Kunz et al., 2019). In the most basic scenario, ABAC relies upon the evaluation of attributes of the subject and object, and an access control rule with a purpose to define operations for subject-object attribute combinations that are allowed (Hu et al., 2014). The high flexibility enables the creation of access rules without the individual relationship between each subject and object, which is common in previously mentioned access control models. For example, Alice is a graduated Nurse and newly employed Nurse Practitioner in the Cardiology Department. When Alice was employed, she (the subject) was assigned a set of subject attributes. In a similar way, an object is assigned its object attributes upon creation, e.g. a folder with Medical Records of Heart Patients (Hu, Kuhn and Ferraiolo, 2015). Usually, the administrator or owner of the object creates an access control rule using attributes of subjects and objects to govern the possible set which is allowed. From the mentioned example, this could be that all Nurse Practitioners in the Cardiology Department can View the Medical Records of Heart Patients (Hu, Kuhn and Ferraiolo, 2015). Additionally, attributes and values may be adjusted throughout the lifecycle of subjects, objects, and attributes without modifying each relationship at the subject/object (Hu et al., 2014). This entails high flexibility as the access control becomes dynamic, where access decisions can change between requests when attribute values changes.

To overcome some of the earlier mentioned problems in other access control models (ACL and RBAC), ABAC is more flexible and allows for the depiction of both fine-granular and coarse-grained access rules (Sharma and Joshi, 2016). In the concept of IAM workflows such as on-boarding, off-boarding, movers of employees are easier managed by policies based on attributes instead of using static roles (Kunz et al., 2019). An immense advantage ABAC has is the feature to change access decisions by altering attribute values, instead of changing the subject/object relationship which defines the underlying rule sets. This entails a more dynamic access control management capability and limits long-term maintenance requirements of object protections (Hu, Kuhn and Ferraiolo, 2015). However, despite the potentiality ABAC display, it has some limitations. One limitation is the computational language and the richness of the available attributes (Hu, Kuhn and Ferraiolo, 2015). The attribute richness heavily relies on the underlying processes for structured management of both attribute-definitions and values (Kunz et al., 2019). Because of this high dependency, erroneously assigned values can lead to unwanted access, resulting in security risks and ultimately allowing intentional or unintentional abuse of insiders (Kunz et al., 2019). Consequently, it is suitable for organizations to have a structured approach for maintaining
attribute data quality. To emphasize this problem, the following example illustrates the problem of an IAM system with erroneously assigned values.

Table 1 depicts the common issue with data quality, very relevant for IAM systems. The different columns express Identity (ID) number, first and last name of an employee, its working location, and cost center (for internal accounting). With this defective data, assumed that the IAM system is using ABAC as access control model, and the policy granting access to relevant file storage if and only if the employee's location equals to Stockholm. Since Bob (or by the HR staff) entered wrong identity information, most likely because this process is done manually, he does not fulfill the ABAC policy, thus is rejected access to relevant resources. Another issue in this table is that Alice has not entered her cost center, which entails the same problem. Additionally, these attributes are rarely revised, as it is seen as unnecessary or a too extensive task leading to declining attribute quality.

<table>
<thead>
<tr>
<th>ID #</th>
<th>First Name</th>
<th>Last Name</th>
<th>Location</th>
<th>Cost Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alice</td>
<td>Andersson</td>
<td>Stockholm</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Bob</td>
<td>Bonnier</td>
<td>Sthlm</td>
<td>Cost Center 1</td>
</tr>
<tr>
<td>3</td>
<td>Pontus</td>
<td>Engström</td>
<td>Stockholm</td>
<td>Cost Center 1</td>
</tr>
</tbody>
</table>

This example has been adapted from Kunz et al. (2019)
3. Literature Review

This chapter introduces a literature review with focus on related topics to the problem statement. Section 3.1 presents some general project management concepts and a general view of the challenges that emerge in IT projects. Section 3.2 display a more narrowed view of the challenges that emerge in IS/IT projects. The last section 3.3 emphasizes the challenges of IS/IT-driven organizational changes. Although section 3.2 and 3.3 have overlapping themes and concepts, they address different dimensions in the IS/IT project implementations.

3.1 Project Management

Over the decades, project management has been recognized to be an efficient tool to handle novel and complex activities (Munns and Bjeirmi, 1996). It is considered to be more efficient over other traditional methods of management, such as the practice of functional divisions in a formal hierarchical organization (Avots, 1969). Many companies have adopted project management approaches and setting up project management offices, mainly to address complex and uprising technological challenges, or to ensure a high capability maturity model level (Hartman and Ashrafi, 2002). In Munns and Bjeirmi’s (1996) research about separating the definitions of project management and projects, they emphasized the definition of project management as the process of controlling the achievement of the project objectives, where the objectives could be a series of activities or tasks that consume resources. Additionally, it seeks to use existing organizational structures and resources, with necessary tools and techniques, without disturbing the routine operation of the focal company (Kerzner, 1989). The function of project management contains defining the needed work, the extent of the work, resource allocation, planning the work, monitoring the work, and adjusting deviations from the initial plan (Munns and Bjeirmi, 1996).

Despite Munns and Bjeirmi (1996) definition of project management – as a framework – no consensus has been established. One of the earliest attempts was performed by Olsen (1971), in a Project Management Institute (PMI) conference, where top executives in project management participated. Their definition was that project management is a matrix organization; the network scheduling and planning; the management of a unique one-time task. Many organization still use similar definitions to describe project management, where most of them emphasize the importance of planning, monitoring, controlling, motivation of participants, where the objectives in time, cost, quality, and performance are key aspects to address (Atkinson, 1999). Additionally, some emphasized the vital inclusion and usage of a project manager and the responsibility the manager has to achieve project success. This is further emphasized by Engwall (1995) and Packendorff (1995), where the project manager must deal with principal problems like: (1) how to structure and plan project activities to meet objectives, and (2) how to ensure that project activities decided upon are executed according to the plan.

In Bourne and Walker’s (2005) paradox of project control, they emphasized the project manager to closely follow and control the outcomes of the project in the prevailing climate of change and uncertainty. This change tends to influence both the project manager and project stakeholders. Senior stakeholders view deviations of the projects budget, schedule or scope/quality, as being out of control, where the reaction could be to regain control, however, that could entail instabilities within the project team. Instabilities can be in the form of resignation or removal of team members, or to follow the initial budget, schedule or scope, where the projects ability to hold criteria’s have drastically changed over time. To hopefully avoid instabilities, a competent project manager is essential, and one of the main reasons for project success (Turner and Müller, 2005; Prabhakar, 2008). The competence required to fully operate and perform the role, with required training, is paramount for any project constellation (Gaddis, 1959). It is further important that the project
manager understands the nature of the organization and the culture that these stakeholders operate within (Bourne and Walker, 2005). The needs and expectations from different project stakeholders must be well-defined, otherwise, the project might not be regarded as successful despite the fact if the project manager holds time, budget and scope.

Project planning is an essential approach to diminish the possibility of project failure. The disadvantage of creating a well-structured project plan could curtail the creativity inside the project group (Bart, 1993). However, the PMI guide of the Project Management Body of Knowledge emphasizes the importance of project management processes and procedures to support planning. The assumption is based on that planning reduces uncertainty, thus increasing the likelihood of a successful project (Rose, 2013). The differential perspectives of a successful project do vary, from project managers view it is successful if it holds the time plan, budget and meets the planned performance, whereas the end-user search for revenues or other possible advantages with the project's outcome (Simpson and Dwain, 1987; Wateridge, 1998). Therefore, each project must have a start-up activity, that clearly defines the success criteria, with project objectives and constraints, to organize the project team and plan the project (Wateridge, 1998). This is further emphasized by Dvir, Raz and Shenhar (2003), where they investigated the relationship between project planning and project success. Their findings displayed the positive correlation between the amount of effort invested to define the project goals and the functional requirements of the IT software, where end-users seek to meet technical specifications and project managers the actual success of executing the project to the plan. They expressed the crucial initial stage in project work where the goal, or aim, of the project must be well-defined with the end user's requirements. This task cannot be performed or achieved without tight cooperation and involvement with the project group and the end-customer (Munns and Bjeirmi, 1996). The interaction must hold until the project is finalized, however, the project plan should not be planned in detail – to give space for project creativity. In the late phase of project work, stakeholders tend to have different opinions in the project's flexibility, although last minute changes are less appreciated by all actors (Olsson, 2006). However, in the end, there is no general consensus about how project metrics, failure, and success should be defined, which tend to be a problem, or challenge, in most project constellations (Hartman and Ashrafi, 2002; Alami, 2016).

History tells that IS/IT or software projects tend to fail during its process or implementation (Markus and Benjamin, 1997; Heeks, 2003; Cerpa and Verner, 2009). Most IT-projects are covered up or ignored – when they fail, however, in other industries when projects fail, they are investigated and reports are written (Hartman and Ashrafi, 2002). One of the biggest challenges for companies when changes appear – because of IT-projects – is the frequent occurrence of project overruns, delays and downright failure (Gibson, 2004). Senior and project management lack the process of assessing the risks of the change up front (changes needed in the business); mitigate the causes of highest risk at the front end and while the project team makes progress; adjust the method of project management to diminish the remaining risks (Gibson, 2004). As Gibson partly addressed, several other researchers have concluded and emphasized that software projects usually fail because of management, organizational or behavioral nature, hence not technical aspects (Johnston, 1995; Whitten, 1995). These flaws are linked to communication, which is another common challenge in IT-projects, especially between different project groups (Pikkarainen et al., 2008). However, Pikkarainen et al. (2008) further argued that agile practices facilitate both formal and informal communication between the development team and stakeholders (customers, testers, other development teams, etc.). They also expressed the essence of additional plan-driven practices to ensure efficient external communication between all actors of software development. Charette (2005) confirms the common scenario of poor communication, focusing on customers, developers,
and users, which tend to result in a failed software project. Nevertheless, with new technologies, IT project ambitious tend to increase in both goal and scale, however, projects still fail due to amleness and uniqueness (Alami, 2016).

Risks play an essential role in any project. Guidelines have slight differences depending on where the assessment will be exercised. In software projects, risk management address two main categories: (1) risk assessment, that covers risk- identification, analysis, and prioritization, and (2) risk control, that covers risk- management planning, resolution, and monitoring (Boehm, 1991). Another risk is the strategic change in businesses. By initiating changes, either minor or greater ones, it does not always indicate a successful result. However, during a change, strong positive indications between participation, goal achievement, and organizational commitment, and negative ones towards resistance to change have been observed (Lines, 2004). According to McElroy (1996), strategic change through projects has four core methods of implementation: education and communication, participation, intervention, and edict. He expresses the weight of intervention, i.e. management by projects approach has a higher success rate to change and less risky. Additionally, awareness of individuals possible reactions to change must be established, to help and guide them through difficulties.

Project maturity, a method to investigate a company’s maturity when executing organizational project work – on a bigger scale, can be suitable to define when managing future organizational changes. The definition of project maturity can slightly differ depending on the industry, but some define it through a maturity ladder with maturity dimensions of knowledge, attitudes, and actions (Andersen and Jessen, 2003). In Andersen and Jessen’s (2003) study, they found high willingness – attitude, to work in the project format, however, the actions to practical implementation were lower. They explain it as, still, a quite high failure rate when running projects is the reason for the lower result. The client’s willingness or interest to be involved in the project is essential for its success (Munns and Bjeirmi, 1996). Additionally, the project team should assist the client in the utilization phase (after implementation of the new IS/IT product), extend their knowledge to the client for enhanced usage of the new system. Nevertheless, the attitude and culture, no matter focusing on change, project work or creating new innovations, are key for future innovating companies to follow the innovating path (Ahmed, 1998).

### 3.2 Challenges and Risks of IS/IT Projects

This subchapter emphasizes some issues, challenges, and risks that the project team or client company experience in IS/IT projects and outsourcing projects. The focus is mainly on client understanding, communication and their effort to cope with the new project and its influence on the focal firm.

#### 3.2.1 Lack of Deep Understanding

IS/IT projects have always, and will probably continue to, experienced immense challenges. One core aspect of this is by defining the need or demand of the project. A firm needs to carefully conduct a study, both to internal and external positioning, before any initiated decision making can be performed (Chou and Chou, 2009). Currently, prototyping is accepted in systems development to enhance the understanding of user requirements, however, it is usually seen as technical prototyping (Fitzgerald, 1998). Fitzgerald (1998) express the idea to extend this concept to business benefits and if they might accrue. He further concerned the aspect of people’s perception, when a system has been modified – improved – but the customers did not realize the enhancements. However, this could have been addressed if prototyping or experimenting was initiated and analyzed before a full commitment to the system was made.
Another challenge is to determine the requirements and expectations of a project. Regarding outsourcing projects, a client will review different vendor proposals and select the one most accurately aligned with the client’s strategic needs and project requirements (Chou and Chou, 2009). In IS/IT projects, the stakeholders alignment of success factors (business benefits) and connecting them to stakeholder’s business strategies could be challenging in the form of managerial support, if success factors are not clearly identified (Hartman and Ashrafi, 2002). Depending on the origin of the project, it needs to be evaluated to its contribution and alignment with the business strategy (Fitzgerald, 1998). Nevertheless, unrealistic goals or benefits that were never likely to be achieved, because they were never challenged by others, is another emerging challenge (Fitzgerald, 1998; Hartman and Ashrafi, 2002; Charette, 2005). Occasionally, the hidden nature of project challenges could arise because of sophisticated statistical analysis or that it can be glossed over in the general excitement employees could have for a project (Fitzgerald, 1998).

The risk of losing control – over IT decisions – appears in several IT/IS project constellations. The loss of control entails the possibility to lose critical skills, uncontrollable contract growth, control of data, and employee morale and productivity (Chou and Chou, 2009). Client liaisons exercise their control depending on their knowledge level (Kirsch et al., 2002). Additionally, client liaisons can exercise behavior control if behavior from IS project leaders have been observed, or if they understand the IS process of development on an appropriate level to guide the project leaders’ behaviors and actions. In the end, a client’s understanding of certain processes plays a key role in the client choice of formal or informal modes of control (Kirsch et al., 2002). Nevertheless, effectiveness projects tend to have higher risks than efficiency projects, mostly because of the two-stage benefits realization process. If, or when, risks have been identified, those influenced might be susceptible to measures that will control or minimize them (Fitzgerald, 1998).

The influences of a third party or stakeholder increase the uncertainty and risks in IT/IS projects, compare to regular projects inside a company since a relationship will be initiated (Chou and Chou, 2009). Creating a relationship is challenging, and in some cases depending on how well the contract between stakeholders has been established (Gonzalez, Gasco and Llopis, 2006). Nevertheless, business units capability must have a high maturity (not emotionally) to ensure that IT functions cannot do everything by themselves, hence leadership capabilities are vital (Willcocks and Feeny, 2006). This is further emphasized by Fitzgerald (1998), although IT often have a vested interest in the project outcome, this should not be purely an IT department task and responsibility.

Evaluation methods, e.g. cost analysis, is another challenge to fully address. In many cases, its predictions were rarely achieved, where important elements were ignored (Fitzgerald, 1998). Additionally, alternative costs such as new computer staff tended to be underestimated in IS/IT projects. Another significantly underestimated aspect is the cost overrun by IS/IT projects (Hartman and Ashrafi, 2002; Charette, 2005), where one main reason is the hidden nature of many IS/IT costs (Fitzgerald, 1998). The phenomenon of second order effects, which often appear as surprises (Willcocks, 1994), are critical in the evaluation process. However, a pilot study of the system with the specific objectives can be suitable to explore second order effects (Fitzgerald, 1998). Another important aspect is to measure the potential benefits if they are quantifiable or not. Occasionally, it is assumed that non-quantifiable benefits cannot be effectively measured, however, management accounting has started to display the opposite (Fitzgerald et al., 1992), hence it could be beneficial in the IS/IT project area (Fitzgerald, 1998).

The focus on development tends to be displayed as a snapshot approach, where problems within a current system are managed as a response to the immediate requirements of the business
Furthermore, it is paramount that the system can manage future requirement changes. Most systems are not designed to accommodate future changes whereas business requirements change on a different and faster cycle. Additionally, systems are shortly out of date, and sub-optimal, after development (Fitzgerald, 1998). The possibility of shortcuts increases due to pressures to quickly develop systems, which could entail constraints in flexibility (Fitzgerald, 1998). Furthermore, losing control of the system or technical platform design and having informed discussions with vendors is one of the potential risks by outsourcing IS/IT functions (Willcocks and Feeny, 2006).

The paramount of the right competence, mainly “soft” interpersonal skills have significantly increased. Technical ability is no longer sufficient enough, where IT functions requires a mix of business and interpersonal as well as technical skills (Willcocks and Feeny, 2006). It is supposed to be applicable across all roles, where each role requires a certain set of people behavior, characteristics, and skills (Willcocks and Feeny, 2006). A challenge is when the business systems thinking is squeezed out of the IT frame, and this gap of knowledge is not appropriately addressed (Willcocks and Feeny, 2006). Additionally, if core IS capabilities are not suitably staffed it will affect the long-time horizon.

3.2.2 Lack of Proper Communication

A challenge that constantly appears in IS/IT projects, and one of the reasons for project failure is communication (Hartman and Ashrafi, 2002; Charette, 2005). Communication is a wide and broad area, hence an applicable challenge in most project constellations. The so-called “make-or-buy” concept can be applied in IS/IT outsourcing projects. However, it is fully necessary to make a comprehensive analysis of both economic and market situation aspects before a final buy can be determined (Chou and Chou, 2009). Typically, the aspect of costs is the major reason for outsourcing, however, high quality and low risk tend to be the reality for achieving successful outsourcing projects (Chou and Chou, 2009). Therefore, if vendors aim to implement a sound quality assessment method in-house, their chances to win an outsourcing contract increase. Additionally, trying to assess the potential impact of a system, emphasizing terms of social, political, and organizational context, is vital. Fitzgerald (1998) expressed the concerns if organizations cannot clearly see the impact until it has happened, where one example was the anticipated impact of introducing word processing would have an impact on secretarial roles. However, customers must perceive the difference and like it, if so, the arguments of effects on business would be more amenable compare to not experienced any difference (Fitzgerald, 1998).

The assessments or evaluations, as already mentioned, is challenging, especially if the project complexity is ignored. Some projects are significantly more difficult to implement than others, which should be taken into consideration when evaluating the project (Fitzgerald, 1998). The inability of handling the complexity of IT projects is one major reason for project failure (Hartman and Ashrafi, 2002; Charette, 2005). The most anticipated beneficial effectiveness projects are likely to be most difficult to implement since they tend to require change, not solely technical but also organizational and political (Fitzgerald, 1998). However, if an organization can establish a high core IS capability success – according to their nine core IS capabilities framework of how to exploit IT activities, some factors as the level of resourcing and responsiveness to new demand will be mitigated if the organization reach a high level of IS capabilities (Willcocks and Feeny, 2006).

Although responsiveness to new demands is common challenges in projects, by involving multiple external parties – influenced stakeholders – in the project work entail other challenges to address. IS/IT outsourcing entails that the contractor is responsible for software construction and
maintenance, hence it could generate risks toward the outsourcing projects (Gonzalez, Gasco and Llopis, 2006; Chou and Chou, 2009). For example, relationship management, communications, contracting and software quality are concerns when being implemented, hence are high-rated risks on IS outsourcing management (Chou and Chou, 2009).

Another typical challenge is the communication of business strategy. Currently, IT functions need to be more business focused, hence relationship building, business systems thinking and a business-oriented CIO is vital (Wilcocks and Feeny, 2006). In Fitzgerald’s (1998) research, he described the problematics when costly investments in projects conflicted with the overall business strategy. He illustrated if a company reduces labor costs, as a result of the change, but further down the business chain was employing staff, clearly indicate some flaws in the communication (Fitzgerald, 1998). He further expressed if second order effects were actively considered and involving the right people, this kind of issue could have been revealed. The right people, or involvement of the right people, is a challenge for projects where the project constellation differs depending on its nature. However, some IT/IS projects that cross departmental and organizational boundaries, it is recommended to include a senior executive in charge for business strategy, as well people from different business areas that are affected by the project (Fitzgerald, 1998). Nevertheless, another challenge in communication and strategy is when business units manage issues in their own unique way (Wilcocks and Feeny, 2006), instead of agreed methods or routines for the entire organization to handle potential barriers.

3.2.3 Lack of Endurance
IS/IT projects tend to experience organizational and individual changes, hence their endurance will most likely be tested. The time aspect is a core component in this dimension, which tend to be critical in the development of relationships (Lee, Miranda and Kim, 2004). Although time introduces risks in relationships, it also facilitates cooperation among self-interested actors and the development of trust (Coleman, 1990). Additionally, time could enable voluntary sharing of resources, with anticipation of deferred compensation (Lee, Miranda and Kim, 2004). The lack of adequate resources tends to be a challenge for IT projects (Hartman and Ashrafi, 2002; Charette, 2005). One immense challenge in this dimension is to ensure that the provider or contractor delivers a product or service that is satisfied by the client. If so, a relationship will likely be established which should guarantee a continuation of e.g. an outsourcing contract (Chou and Chou, 2009). Both the client and the provider will benefit from the IS outsourcing project if they have established high cooperation (Chou and Chou, 2009). Additionally, another important aspect is the coordination, which is the process of managing interdependence between entities to accomplish agreed-upon tasks and activities. This is further emphasized by Fitzgerald (1998), where it is vital to keep track of how well the client’s expectations are met during the life of the new system. In addition to new systems, it is difficult to determine to either build on existing strengths and existing systems to enhance the functionality and effectiveness of the system (Earl, 1989) or to implement a new IT system from scratch. In the latter case, problem arises if a “big-bang” approach is adopted, hence becomes too much to manage for the client company (Wilcocks, Feeny and Islei, 1997).

The authority level of IS/IT projects is another challenge to address. Often, client liaisons may not always have formal positions of authority over project leaders in IS project to exercise control (Kirsch et al., 2002). Additionally, client liaisons could have difficulties addressing whether the project leader met requirements or not. To measure if the implementation date has been met is no greater problem, however, to determine if the development effort adhered to all departmental or organizational standards is a bigger issue (Kirsch et al., 2002). Although there could be a lack of authority for client liaisons, there are cases when the client chooses not to use certain control. This
could be a result of poor commitment or lack of prioritizing time into the project (Kirsch et al., 2002), where employees are unable to schedule and plan for additional activities in their already hectic work environment (Fitzgerald, 1998). In those cases, there is a need to hire new staff, otherwise, end-users and end-users management might either not devote the necessary time to assist the new project or they might be involved at the expense of their ordinary tasks. Additionally, project leaders tend to exercise self-control to ensure that the project meets expected targets. In Fitzgerald’s (1998) paper, he expressed the external forces that tend to be in charge, however, alternative paths and solutions (mainly focusing on costs and benefits) should be considered – assessment – to ensure that the most suitable option is selected.

Another concern is the increasing amount of IT/IS projects types that will never demonstrate efficient cost savings, hence is quite unlikely to be able to display evaluation hurdles (Fitzgerald, 1998). IS/IT investments are crucial, hence cannot solely be relied on traditional cost displacement evaluation approaches since it might miss opportunities and jeopardize the survival of the organization (Wiseman, 1985). Therefore, depending on the type of IS/IT investment, it might need different approaches of evaluation (Fitzgerald, 1998). Determining the investment is a difficult decision-making process, especially if the investment is mandatory one – a new legal requirement. These mandatory investments tend to be developed through changes, where it could either be influenced by a powerful external customer or be driven by competitive pressures (Fitzgerald, 1998). In addition to the mandatory, another investment type is the infrastructure, which refers to e.g. technological platforms and communication systems. However, it is quite difficult to evaluate them. Instead, they tend to enable other investment opportunities (Fitzgerald, 1998). Although the investment must be carefully analyzed, the traditional cost displacement has one advantage. It increases the control of the realization of benefits, whereas other processes displaying greater opportunities, but are more complex, might get lost during the way (Fitzgerald, 1998).

The aspect of architecture planning, and to ensure that it is closely aligned with business planning, could be problematic for companies seeking outsourcing methods. Willcocks and Feeny’s (2006) case at Dupont displayed the challenge when in-house knowledge is dropping, hence a gap of knowledge was realized. Therefore, retaining human capabilities and experienced staff could be challenging to address and ensure. Another possible challenge is fear, when innovating, is to lose newly created knowledge to competition (Kale, Singh and Perlmutter, 2000).

3.3 Challenges of IS/IT-driven Organizational Change

This subchapter emphasizes some issues or challenges that the project team or client experience in IS/IT projects and outsourcing projects when organizational changes emerge. The focus is mainly on the client’s lack of support when making a change, communication within the company where leadership plays a central role, and the strategy when making a change.

3.3.1 Lack of Support

In most changes, there might be challenges in the form of satisfaction or resistance if not support or anchoring is established. Anchoring and communication are separated areas, however, very interrelated and needed when changes emerge. If a suitable communication between employees and stakeholders about e.g. IS/IT outsourcing plan have been established, it may reduce the severity of resistance (Chou and Chou, 2009). Cost savings via labor displacement that eliminates or reduces manual systems, hence staff, could entail challenges despite the systems improved functionality (Fitzgerald, 1998). Therefore, it is vital that clients or customers understand this change and perceive it as an improvement over the system or service they currently use (Fitzgerald, 1998). Typically, it is a challenge when or if a project changes the nature of peoples roles, retraining
costs would emerge, however, other concerns as a possible reduction in job satisfaction could be more problematic (Fitzgerald, 1998). Leaders or business managers must ask themselves if resistance might appear to the system implementation by entrenched power bases, as well if the technology is an untried state of the art (Fitzgerald, 1998).

Another challenge is the corporate culture. Organizational culture could possibly question the use of formal control, where cultures that value formality could possibly affect the selection of outcome over self-control (Kirsch et al., 2002). Nevertheless, exercising behavior control is not sufficient in the presence of information alone, hence the client’s must understand the information in order to act on it (Kirsch, 1996). It is essential that reviews or assessments emphasize the valuable learning opportunities, instead of hunting for guilty parties if the outcome is not satisfactory (Fitzgerald, 1998). Therefore, the evaluation culture should be made open and non-threatening.

Fitzgerald (1998) express the importance to think through potential future business changes, to hopefully make them accommodated. The proposed project life should be highlighted, however, it tends to be easier to predict future changes in the near future rather than long term ones. In Fitzgerald’s (1990) study, he indicated that most changes and enhancements made to existing systems were predictable at the development stage, hence the consequences could have been easily accommodated (Fitzgerald, 1998). These changes could be a variety of trivial, fundamental, or the change of the century.

Another aspect in this dimension is the usage of incentives to encourage specific behavior, although they do not necessarily need to be financial, the most effective tend to be those with personal perceptions of worth and value (Fitzgerald, 1998) Managing incentive systems tend to be critical for IS/IT projects that involve organizational change. It can be argued that these issues should not be of IS/IT personnel’s province, instead, it should include those that are most involved in the process (Fitzgerald, 1998).

3.3.2 Lack of Organizational Communication
In the occurrence of organizational change, communication is a key player to master. As with any project or IS/IT outsourcing plan, leaders or responsible actors must realize and understand the business environment, the success factors of a project, and the potential risk they entail (Chou and Chou, 2009). A common challenge is that stakeholders have not agreed on a predefined project success, or that they have different mindsets of project success (Hartman and Ashrafi, 2002), which indicate a lack of communication. Another potential communication challenge is if a client liaison has abdicated its control (Kirsch et al., 2002). A research and discussion paper by Earl and Runge (1987) found that a large proportion of successful competitive edge applications by-passed the standard approval routines and instead relied on management hunches or “strategic insights”. Although this approach to justification occasionally leads to success, it still entails a high risk since it relies on intuition and faith (Fitzgerald, 1998).

Another challenge is to recognize and realize the importance of business champions – individuals that voluntary advocate organizational changes, which might be a crucial aspect of project success when implementing a project (Fitzgerald, 1998). This connects to the study by Willcocks and Feeny (2006), where they investigated the IS/IT outsourcing case of Dupont’s IT functions. They expressed immense challenges to involve business units and power brokers and engage them with IT issues. The leadership capabilities and business-facing capabilities in the IT function are therefore of paramount value.
In Kirsch et al. (2002), the concept of clan control could be beneficial for client liaisons to increase their relatively low understanding of system development process but still maintain their control over IS project leaders. In those cases, participation in the form of project team meetings, understanding project teams’ goals, norms, and values, could result into higher client understanding, hence they could realize the links between observable behavior and project progress. Depending on the clients understanding and knowledge, which tend to be highly influenced in how the communication has been managed, it affects the type of control being exercised.

3.3.3 Lack of Strategy and Objectives
In the case of change, a company’s strategic plan and objectives must meet the decision of initiating an IS/IT project. For some, investments will only occur if clear connections with the overall business strategy are recognized (Lederer and Sethi, 1992), while others have adopted a strict financial evaluation of IS/IT proposals and will only implement those that display a financial benefit (Fitzgerald, 1998). The challenge is that the latter tend to only approve IS/IT investments that lead to cost savings. This entails potential loss of opportunities of other projects investments since they are not properly justified. In IS/IT outsourcing projects, most tasks must be fulfilled during the planning and strategic setting stages, where it must include outsourcing goals, objectives, scope, schedule, cost, and processes (Chou and Chou, 2009). These tasks and goals could be performed in the cheapest possible way, however, it is not always the optimal way to achieve the objectives associated with each task (Fitzgerald, 1998). Careful planning is vital to prepare the client company for pursuing a successful outsourcing project, where the connections of IS/IT applications to business strategy is paramount for successful organizations (Lucas and Turner, 1982). An independent strategy may arise from either a desire for strategic competence or a lack of vision, hence all companies in the independent pattern may not be representative in the IT outsourcing strategy (Lee, Miranda and Kim, 2004). The lack of a vision or the ambiguity of the vision tend to affect the project, hence challenges in the form of inappropriate measurements, specification changes and delays may accrue (Hartman and Ashrafi, 2002). Furthermore, the alignment of the IS/IT project with business units goals and the promised value propositions is essential to facilitate for the client liaison (Kirsch et al., 2002), as well for the IT architecture (Willcocks and Feeny, 2006).

 Usually, before the project gets approved to initiate, an assessment must be performed. Ideally, the project should be approved by a consensus of those in the evaluation team. The evaluation team possesses mandate, are empowered to commit to the project, and are responsible to ensure its success in connection to the defined terms (Fitzgerald, 1998). The idea is to closely link tasks and responsibilities, development, and implementation together. However, if they are separated, the goals and objectives might become diluted or lost (Fitzgerald, 1998). Nevertheless, if a project is initiated, it is vital that the client and suppliers relationship is evolving to a more strategic role, where the client could use the supplier’s intellectual capital (Willcocks and Feeny, 2006). In addition to the relationship, under ideal circumstances, the integrative nature of partnership could diminish problems emerging from inexplicit contracts or uncertainty, especially if the relationship is of the long term type (Lee, Miranda and Kim, 2004). Long term relationships or contracts are often preferable because they can distribute the initial set-up costs over a longer time period. Additionally, a long term contract reduces risks and uncertainty associated with business functions and improve financial predictability (Martinsons, 1993). Lee, Miranda and Kim’s (2004) study expressed that a client with prior favorable experience of an outsourcing relationship tends to undertake the same provider for a long term contract. They also state that the increasing attention of IS/IT outsourcing
emphasizes the importance of actors realizing the power of congruence of their actions, which create more advantages compare to non-congruent actions. However, if the interests diverge from the client and the provider, partnership or relationships may create challenges (Lacity and Willcocks, 1998).

The quality dimensions of outsourcing consist of integration, cooperation, and coordination (Chou, 2007). Integration is the various of attribute and processes of the relationship into each party’s or entity’s structure, policies, and procedure (Henderson, 1990), which can be a challenge in IT projects (Charette, 2005). If an IS outsourcing project meets the goals and needs of the project, it is highly integrated. Cooperation emphasizes the spirit of working together, with objectives of achieving mutual benefits (Anderson and Narus, 1990). This is further emphasized by Willcocks and Feeny (2006), where high performers with suitable skills, capabilities, and orientation are necessary, as well to be coordinated as a team. Lastly, coordination manages the interdependence between entities to accomplish agreed upon tasks.

Project leaders play an important role in integration and cooperation, however, overreliance on project leader’s self-control tends to disengage client liaisons, which entail potential dilemmas. Client involvement (Kirsch et al., 2002) or those that are most affected by the new system should get the opportunity to influence events, which could predict the assessments of second order effects (Fitzgerald, 1998). Willcocks (1994) discovered that a large proportion – almost half of the organization, did not include the user department in the evaluation process. He expressed it as “This cuts off a vital source of information and critique on the degree to which as IT/IS proposal is organizationally feasible and will deliver on user requirements”. Furthermore, a vital challenge is if IT managers get cut off or excluded from critical business discussions and decisions (Willcocks and Feeny, 2006).

Although project managers have a vital role, Fitzgerald (1998) express the importance of organizational training and learning. It is required in any post-implementation review, to make recordings of the debates and justifications. In addition, some elements are always underestimated, where training for users tend to take a longer time than anticipated. In Willcocks and Feeny’s (2006) case about Dupont’s outsourcing of IT functions, they clearly expressed that Dupont could only move from cost reduction to business value if business executives had proper training on the transformational possibilities of IT. Nevertheless, the lack of training in project management is considered to be one of the main reasons for IT project failures (Hartman and Ashrafi, 2002; Charette, 2005).
4. Methodology

This chapter describes the chosen methods for conducting the thesis. Section 4.1 presents the research design and core methodology to conduct the research. Section 4.2 presents the collection of empirical data and argues for the made choices. Section 4.3 presents the data analysis, where a thematic analysis approach is argued for in this context. Section 4.4 presents the research quality and argues how to uphold the requirements to ensure validity and reliability. The last section 4.5 describes the research ethics and sustainability.

4.1 Research Design

This thesis is based on a qualitative case study approach (Yin, 2003; Flyvbjerg, 2006). The reason for this approach is twofold. First, the studied phenomenon – IAM-projects – are relatively understudied in the field and requires a deep contextual understanding. Second, the research questions – “Why do challenges emerge when an Identity and Access Management solution is implemented?” and “What challenges arise in the change process that an Identity and Access Management implementation create inside a client company?” are open-ended, and, such questions can be addressed by qualitative methods. IAM implementations are complex and involve several stakeholders with different opinions. It also involves several business entities inside the client company, which increases the complexity of the implementation. Therefore, to fully understand the studied phenomenon, data gathering through semi-structured interviews was conducted (Blomkvist and Hallin, 2015). Another benefit with semi-structured interviews is the concept of methodological triangulation, which refers to using different techniques to collect data within one study, e.g. through interviews, observations, and documents. This to ensure that the data is telling you what you think it is telling you (Saunders, Lewis and Thornhill, 2009).

The first phase of the thesis had an explorative and unstructured approach. The initial two interviewees were emphasized to speak freely and to discuss any topic they thought could be of interest to enhance the author’s knowledge and insights about IAM-projects. The explorative approach is further adequate when the research area lacks prior investigated literature (Blomkvist and Hallin, 2015). Additionally, the purpose of an explorative approach was because of the many identified dimensions in the studied problem, where several trajectories could have been taken. Although an explorative approach tends to imply an inductive approach, this thesis has taken the form of an abductive approach. The reason is that it was necessary to revisit the literature after each interview, to ensure that the research questions were able to be answered. The complexity of IAM was slowly realized through each interview, hence the abductive approach – moving back and forth – was essential for the developing trajectory of the thesis. Although the abductive approach is a combination of inductive and deductive approaches, it begins with observations to seek the most likely explanation of the observations (Saunders, Lewis and Thornhill, 2009). However, the abductive reasoning makes plausible conclusions, but do not necessarily verify it.

According to Dubois and Gadde (2002), the abductive approach is suitable for case studies, where the purpose is to investigate a new phenomenon. In addition, Yin (2003) express that a case study does not only aim to explore a specific phenomenon, it also seeks to understand it in a certain empirical context. This thesis was developed as a case study in IAM implementations and the challenges they create, such as the client implementation phase and the process of change. The investigated perspectives were mainly on the client company – the company seeking a new IAM solution, but also on the contractor – the external stakeholder with an idea of solution, and the project team developing the solution. According to Flyvbjerg (2006), one advantage of the case study is the effect to “close in” on real-life situations and to directly test views in relation to the phenomenon as they unfold in practice. This is arguably suitable for IAM-projects since the
multiple dimensions need a deeper and isolated investigation on the specific phenomenon to fully understand it. The case is limited to Swedish companies, both public and private, where the scope cover domains such as government authorities, consultancy firms, healthcare organizations, academic institutions, IAM vendors, and revision companies. The domains were chosen because of the in-house knowledge, or likelihood to set up face-to-face interviews, from the consultancy firm where this thesis was conducted. Despite the low inclusion of domains, the case study can be argued to be applicable for any Swedish company, which is implementing an IAM system. The reason for this is that the emerged implementation challenges appeared to be similar despite the differences in company size (e.g. number of employees) or company activities. Additionally, the respondent’s prior experiences in the studied area is another argument for the finding’s applicability. However, the findings realized an increased level of the organizations IT-maturity tended to diminish some of the implementation challenges. Nevertheless, despite the advantages of case studies, one drawback is the low scientifically generalization, as well as the risk of bias view influencing the outcome of the findings (Yin, 2003).

4.2 Data Collection
The main method to collect and gather primary data was in the form of interviewing individuals with experience from an IAM implementation. The interviewee could either be an active or former project member from an IAM-project, or an individual that performed the initial “pilot study”, which had constant communication with the IAM-project team. Secondary sources in the form of a literature review on IS/IT projects and outsourcing projects since they display similar challenges when e.g. implementing an IS/IT function to a company. The sources had a wide mix of topics and different published formats (book, article, scientific journal). The literature review was conducted through a higher abstraction level, as described by Rai (2017). This method does not only contribute to the immediate practical need – the challenges of IAM implementations, but it could also make a broader and long-lasting scholarly contribution to a more generic problem. In addition to the literature review, another secondary source was collected from the advisory firm Gartner Inc. The reason for this is their leading analytical role in the IAM sphere, which create a more detailed comparison with the conducted empirical findings.

Observations
This master thesis was conducted inside a Swedish consultancy firm, located in Stockholm. The department where the author performed the thesis was inside the consultancy firm’s security unit, hence a lot of in-house competence was gathered in the area of IAM. It gave a bigger understanding of the complexity IAM-projects possess and created opportunities to interact, discuss ideas and thoughts with experts in the field. The author participated in other meetings and interviews to grasp concepts in both security and changes management. Even though some events had nothing directly connected to IAM, the segments that IAM-project affects are many, thus it can be argued to be beneficial to increase the knowledge in those areas. In this observation phase, data gathering was not performed, although the conducted insights created a better understanding and entailed new ideas and potential discussion topics for upcoming interviews.

Secondary data
In addition to the observations, non-academical papers were collected to increase the understanding of the studied phenomenon, as well to display a narrower discussion with the empirical findings. The global research and advisory firm Gartner, Inc. perform tests on vendors different IAM/IGA solutions. Their research observes key challenges when implementing IAM systems, both regarding technical and management aspects. They emphasize which vendor or concept that address issues and problems to new features and trends. In each published report,
they express key findings and recommendations for top management to follow. Therefore, a few selected papers have been included, displayed in Table 2. These papers gave an additional perspective on the problematics IAM/IGA implementations tend to create. These insights enriched the creation of the questionnaire – the template that constituted the semi-structured questions – and displayed potential discussion topics that could arise during upcoming interviews.

Table 2: Secondary data from non-academical papers

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. Gaechtgens, K. Kampman, B. Iverson</td>
<td>2018</td>
<td>Magic Quadrant for Identity Governance and Administration</td>
</tr>
<tr>
<td>B. Iverson, K. Kampman</td>
<td>2018</td>
<td>A Successful IAM Program Begins With a Vision</td>
</tr>
<tr>
<td>K. Kampman</td>
<td>2018</td>
<td>Best Practice for IAM Program Management and Governance</td>
</tr>
</tbody>
</table>

Interviews
The main conducted interviews were semi-structured, although the initial ones were unstructured – in this thesis called open-question (OQ) interviews. These interviews emphasized the interviewee to speak freely, where the author minimized the act of asking detailed and predefined questions (Saunders, Lewis and Thornhill, 2009). This approach is suitable in the initial phase of the thesis, where the studied phenomenon is still not determined. This method can be further argued to have advantages because of the possibility that the interviewer, unintentionally, ask questions that form the interview into uninteresting fields, which have no purpose for the author to address. The open-question interview had a very limited structure, where it mainly ensured that the interviewee had a connection to IAM and have experienced challenges inside organizational implementations, see Table 3. The method to collect data was mainly through physical meetings – face-to-face – where a majority acknowledged the possibility to record the interview. The audio recording is advantageous since it gives the author the possibility to closely re-listen to the interviewee’s statements, to diminish any misconceptions that could have occurred during the interview. The audio was recorded by a smartphone, with its preinstalled audio recorder application. The targeted interview time for each interview was sixty minutes, however, depending on the interviewee’s depth of knowledge, the time aspect became a flexible component. The subjects anonymity is of highest priority, where the interviewer always introduced how the data should be treated: only used in this specific thesis; not shared to other parties; no disclosure of identity to protect their integrity – both for the individual and for the organization; only general titles of position and organization will be used – no direct connection can be made to the interviewee. The consent of contacting the interviewee, through email, if anything from the interview was unclear, was established before the end of the interview. Additionally, notes where always performed in conjunction with the audio record, since it can emphasize information the interviewee stated (Blomkvist and Hallin, 2015). All interviews were conducted in Swedish – questions stated and answers collected – and translated to English for this thesis. In addition, all interviews were transcribed, to facilitate the search for patterns and to compare the collected data (Denscombe, 2016).
Table 3: Open-Question Interviews

<table>
<thead>
<tr>
<th>Interviewee, Date</th>
<th>Company/Institution</th>
<th>Position/Title</th>
<th>Recording</th>
<th>Duration</th>
<th>Field of Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>OQ1 15/02/19*</td>
<td>Consultancy Firm</td>
<td>IAM Project Leader</td>
<td>Audio Recorded</td>
<td>50 min</td>
<td>Project Management</td>
</tr>
<tr>
<td>OQ2 18/02/19</td>
<td>IAM Company</td>
<td>Design Architect</td>
<td>Notes Only</td>
<td>60 min</td>
<td>Access Control</td>
</tr>
</tbody>
</table>

* Phone Call

The semi-structured (SQ) interviews were established when the researchable topic was set, and a questionnaire was created. The questionnaire included topics such as the critical aspects of an IAM implementation (from any stakeholder’s perspective), business entities working in isolation, communication, organizational changes, resistance, leadership, and a few other predetermined topics. However, interviews were shaped based on the interviewee’s prior experience and knowledge, hence predetermined topics from the questionnaire was occasionally expressed before the question should have been raised. Saunders, Lewis and Thornhill (2009) express that the order of the questions could vary, it all depends on the flow of the interview. The benefits of semi-structured interviews are to get in-depth knowledge but still maintain the core questions of interest (Blomkvist and Hallin, 2015). In this phase, the inclusion and exclusion of potential interviewees were easier determined. Only individuals with experience from IAM-projects or individuals that face this implementation were subjects to the interview, see Table 4, however one exception was made. The reason for this was a miscommunication between the author and the interviewee. Although respondent SQ12 did not have any prior experience in IAM implementations, the respondent has acted as a CIO for multiple organizations over several years. In addition, the findings from that interview were in line with prior findings from other interviews with appropriate knowledge of IAM implementations. By using this interview in the data collection, it is possible that the generalizability of the thesis is improved since the interview widen the scope of respondents, where similar IAM challenges were realized.

The first two open-question interviews were decided as suitable sampling based on the conducted information. The reasons why they were contacted in the first place was because of the corporate supervisor that emphasized them as suitable ones. Based on the aftermath of each interview, some recommendations for further interview subjects were stated by the interviewee – also known as the snowball sampling. This was of high value since an experienced individual in these security circuits is argued to have suitable knowledge of potential subjects that could increase the data set and validity of the study. This proved to be an efficient method where a certain level of saturation implied that the recommended individuals positively were suitable subjects. In addition, the interviewee’s current position – employment, and knowledge level in the IAM sphere were essential aspects to be included to conduct an interview. The anonymity of the interviewee was performed in the same manner as previously described in the open-question interviews. Furthermore, as the sampling of respondents were mainly based on the recommendation approach, a few more interviews were conducted. These individuals were selected through the LinkedIn platform. The reason for this was the recommendation from an interviewee that emphasized a few organizations that either currently was implementing an IAM solution or had recently implemented one. The saturation level can be argued to be achieved since the interviewee’s through the LinkedIn platform displayed high connections with prior interviewee’s statements.
Table 4: Semi-Structured Interviews

<table>
<thead>
<tr>
<th>Interviewee, Date</th>
<th>Company/Institution</th>
<th>Position/Title</th>
<th>Recording</th>
<th>Duration</th>
<th>Field of Expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ1 05/03/19</td>
<td>Academical Institution</td>
<td>IAM Project Leader</td>
<td>Audio Recorded</td>
<td>90 min</td>
<td>IAM &amp; Project Management</td>
</tr>
<tr>
<td>SQ2 12/03/19</td>
<td>Healthcare Authority</td>
<td>IAM Developer</td>
<td>Audio Recorded</td>
<td>60 min</td>
<td>Security</td>
</tr>
<tr>
<td>SQ3 14/03/19</td>
<td>IAM Company</td>
<td>IAM Salesman</td>
<td>Audio Recorded</td>
<td>40 min</td>
<td>Security</td>
</tr>
<tr>
<td>SQ4 21/03/19</td>
<td>Government Authority</td>
<td>IAM Administrator</td>
<td>Audio Recorded</td>
<td>40 min</td>
<td>IAM &amp; Change Management</td>
</tr>
<tr>
<td>SQ5 22/03/19*</td>
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<td>IAM Architect</td>
<td>Audio Recorded</td>
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<td>IAM</td>
</tr>
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<td>SQ6 26/03/19</td>
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</tr>
<tr>
<td>SQ7 27/03/19</td>
<td>Consultancy Firm</td>
<td>IAM</td>
<td>Audio Recorded</td>
<td>40 min</td>
<td>IAM &amp; Change Management</td>
</tr>
<tr>
<td>SQ8 28/03/19</td>
<td>Service/Revision Firm</td>
<td>IAM</td>
<td>Audio Recorded</td>
<td>60 min</td>
<td>IAM</td>
</tr>
<tr>
<td>SQ9 29/03/19*</td>
<td>Consultancy Firm</td>
<td>IAM Coordinator</td>
<td>Notes Only</td>
<td>40 min</td>
<td>IT-projects &amp; Change Management</td>
</tr>
<tr>
<td>SQ10 01/04/19</td>
<td>Consultancy Firm</td>
<td>IAM Coordinator</td>
<td>Audio Recorded</td>
<td>40 min</td>
<td>IAM &amp; Security</td>
</tr>
<tr>
<td>SQ11 01/04/19</td>
<td>Consultancy Firm</td>
<td>IAM Coordinator</td>
<td>Audio Recorded</td>
<td>40 min</td>
<td>IAM</td>
</tr>
<tr>
<td>SQ12 02/04/19</td>
<td>Food Industry Company</td>
<td>CIO</td>
<td>Audio Recorded</td>
<td>50 min</td>
<td>IT-projects and Security</td>
</tr>
</tbody>
</table>

* Phone Call

4.3 Data Analysis

The analysis should be performed in a systematic way, to ensure high reliability and validity, and essentially to create appropriate conclusions based on the empirical data. The analysis was only made on the semi-structured interviews since the open-question ones served the purpose to realize the studied phenomenon, not to initiate the collection of data. In addition, the open-question ones emphasized other topics that were not of interest to investigate. The data analysis was performed by thematic analysis, which is suitable in qualitative studies in e.g. social science (Blomkvist and Hallin, 2015) and psychology (Braun and Clarke, 2006). The thematic analysis offers an accessible and theoretically flexible approach to analyze the qualitative data. It searches and identifies themes and patterns from the conducted data, to find similarities and, or, differences. A theme is classified to capture something of value in relation to the research question. A theme represents some level of patterned response or meaning within the data set (Braun and Clarke, 2006). During the coding phase of data, a theme or pattern is not solely determined by the size – the amount of instances appearance. Instead, the prevalence in terms of space within each data item and of prevalence across the entire data set is important to reflect upon. For example, an ideal scenario would be to
observe several instances of the theme across the data set, however, this does not entail that the theme itself is more crucial.

In this thesis, the conducted interviews have emphasized some vital challenges within the project work of IAM implementations. Based on the conducted interviews, the most frequent challenges have been highlighted, however, even less frequent ones have been emphasized depending on the statement’s magnitude and influence on the findings. Depending on the interviewee's title, connection to IAM and earlier experiences, the author’s judgment was necessary to determine what a theme is, with a flexible approach (Braun and Clarke, 2006). Although the thematic approach is flexible, it has some disadvantages such as lack of analytical narrative when analyzing the data, and overlap between themes or the inconsistency of them (Braun and Clarke, 2006). Nevertheless, the six phases of thematic analysis, in specific order, are:

1. Familiarizing yourself with your data
2. Generating initial codes
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Producing the report

These steps accurately describe the analysis approach of this thesis. Initially, when the interview was transcribed, a proper read through was performed. This way, the author was re-lighted of the interview, to remember the tone and atmosphere. When the familiarizing of the data was achieved, the search of codes or themes were initiated. This step is crucial but also time consuming since patterns are not always easy to find. In the seeking of themes, certain statements that potentially could answer the research questions, or at least display potential challenges in an IAM implementation, were marked in the transcribed document to make further comparisons. When all documents have been read through and patterns have been marked, the author established several respondents’ quotes – with similar content, into a code. This code could, for example, be “Not an IT-project”, which refers to that an IAM-project is not an IT-project. Several codes were created and constituted into certain categories. This step considered the codes connection with each other and emphasized a category that considered a dimension of higher level. When several categories were established, final themes were easier determined. Occasionally, a respondent quote could directly address the theme, however, most quotes were analyzed in an iterative way to ensure its connection to the theme. When several themes were realized, the author visualized the themes into a figure with the created codes. This figure tried to facilitate the understanding of the studied phenomenon, as well as to display the complex interrelation of the findings. Therefore, because of the pre-defined problem and its complexity, as well as the partly focus on the process of change, the choice of thematic analysis can be argued to be well-suited for his thesis.

4.4 Research Quality

The quality of the thesis was ensured, as previously stated, by conducting it in a systematic way. It is essential that the researcher remains impartial, through the entire process, and always critically reflect upon the conducted findings. This to tackle the events of biases that occur in interviews, thus influence the interpretation. The interviewee’s statements are mainly based on personal experience and knowledge. However, this is one of the strengths in the qualitative researching method, to collect different individuals’ perspective and make appropriate conclusions. Furthermore, to establish a higher degree of quality, thus mitigate the potential bias, this thesis
received peer-reviewed feedback from both academic and corporate supervisors, master thesis students and professors in seminar sessions.

The validity refers to if the findings really are about what they appear to be (Saunders, Lewis and Thornhill, 2009). To ensure high validity, the literature review and conducted interviews must be aligned with the chosen problem statement, purpose and research question (Blomkvist and Hallin, 2015). In this thesis, the nature of explorative approach – the initial open-question interviews – shaped the questionnaire together with the initial literature review. However, since the thesis took an abductive research approach, the conducted data was constantly reflected upon, hence the literature was slightly modified in each interview iteration. One form of validity is the construct validity, also known as operationalization, which identifies the correct operational measures for the concepts being studied. One of the key concepts that are used in this thesis is challenge. Challenge is a commonly used term in both project management literature (Engwall and Jerbrant, 2003) and other fields (Eisenhardt and Graebner, 2007; Murnane and Steele, 2007). According to Cambridge Dictionary (2019), the wording of challenge can be used in different scenarios and might have different meaning depending on where it originated and is used (e.g. US or UK). It will also differ if it is used as a noun (difficult job, invitation, question, instruction, or refusal) or as a verb (invite, doubt, test, stop, or refuse to accept). In this master thesis, its definition can be expressed as “Something that needs great mental or physical effort in order to be done successfully and therefore tests a person’s ability”. The themes that have emerged in the data analysis (e.g. insight, communication, endurance, anchoring, and vision) have the characteristics of a challenge because they require efforts and willingness to be accomplished, as well to test individual’s competence in how to solve a problem. As an example, the theme Insight indicated challenges when defining client demands. Since the client rarely possessed knowledge of what they really want to achieve with a new IAM-solution (lack of insight), it became a challenge for the project team or contractor to address. Another important aspect to the definition of challenge is the word’s origin from the Swedish word “utmaning” (Nationalencyklopedin, 2019), which has been translated into the English word challenge. Generally, it could be argued that the translation is quite accurate, however, the Swedish word, like the English one, could have different meanings depending on context and usage, hence should be considered in further analysis.

The reliability refers to the extent to which the techniques of data collection or the analysis procedures will yield consistent findings (Saunders, Lewis and Thornhill, 2009). To ensure consistency of the conducted findings, potential threats of reliability must be closely followed. The threats can be defined as the subject of participant error; the subject of participant bias; observer error; observer bias (Saunders, Lewis and Thornhill, 2009). To describe it with some context, one example could be if the research investigates employee’s enthusiasm in their working environment, their response could vary depending on what day the interview is conducted (e.g. Monday mornings vs Friday afternoon). In this example, it is important to have awareness of the possible flaws in reliability the research could experience, and how to diminish them. Another threat is that interviewees could answer the questionnaire as their bosses want them to. In this example, the anonymity of the interviewee is essential to establish high reliability. This was ensured since no information in the thesis can be tracked to the interviewee. In addition, when the thesis is completed, all conducted data is deleted. The other threats emphasize differences in how the interviewer observed and conducted the interview. To ensure that the same material will be conducted, no matter the individual that collect it, a well-defined structured is highly recommended. Although respondents’ answers might differ later in time since their knowledge level in the area might increase. This thesis has addressed the importance of providing clear and easy to understand methods in both data collection and data analysis. Adequate information about each respondent is
presented and the most essential topics from the questionnaire are also stated. This way, the reliability of the thesis is at an adequate level.

4.5 Research Ethics and Sustainability

The research ethics raise questions about how to formulate and determine the research topic, research design and gain access, collect data, process and store the data, analyze the data and finally express the thesis findings in a moral and responsible way (Saunders, Lewis and Thornhill, 2009). In further extent, the thesis must ensure that the research design is both methodologically sound and morally defensible to everyone that is involved. According to the Swedish Research Council and Swedish Engineers Code of Honor, certain criteria’s must be ensured when conducting research. As an engineer, the responsibility to manage and distribute technical knowledge in an appropriate way, where the technology should enhance societies and not used for anything else (Sveriges Ingenjörer, 2019). Additionally, there exist four main requirements when conducting research (Vetenskapsrådet, 2002). The thesis has addressed all requirements and ensured that the interviewee is fully aware of how the information will be used, for what purposes and how the interviewer holds the confidentiality of the interviewee. The requirements are: (1) the information requirement, (2) the consent requirement, (3) the confidentiality requirement, and (4) the good use requirement.

This study does also consider its impact on sustainability. According to Baumgartner and Rauter (2017), sustainable aspects can be divided into three dimensions: (1) environmental – ecological aspects, (2) social – human health, education, democracy, etc., and (3) economic – economic growth and the value generation of it. However, in the economic dimension, it is essential that human resources or other material are not jeopardized or endangered. This thesis mainly emphasizes the social and economic dimensions. The empirical findings on the IAM challenges could act as a simple framework for organizations. This way, organizations could be proactive and realize their own limitations before the implementation initiate. In addition, this could facilitate the implementation and communicate the changes that will affect individuals working in the organization. Proactive referrers to several aspects, for example to educate and learn employees of the new IAM system, as well as to communicate the change, hence unnecessary stress for employees would be better addressed. The other dimension this study address is economic. One main reason for organizations to implement a new IAM system is the benefits of automation. According to a paper by Gartner, organizations that lack formal IAM programs will spend 40% more on IAM capabilities, where they will realize and reach fewer business objectives compare to organizations with established IAM programs (Kampman, 2018). Therefore, by ensuring a good IAM implementation that will result in a well-functional IAM system, it should entail economic value for the organization.
5. Empirical Findings

This chapter describes the empirical findings and the data analysis. Section 5.1 introduces the different stakeholders involved. Section 5.2 emphasizes the most common and general challenges, which address the first research question. These challenges could arise without any influence, or connection, of the process of change. Section 5.3 emphasizes the challenges with organizational changes, hence address the other research question. It should be stated that some of the findings are suited in both challenge areas, however, if they are concerned as common challenges they have been explicitly placed in Section 5.2 unless they solely have a connection to the change phenomenon.

5.1 Stakeholders

An IAM-project implementation is a challenging process and, as this thesis assumes, involves four main stakeholders. The process starts with the Client — the actor that has realized the need to improve their identity and access management has made an order through another actor — the Contractor. The contractor possesses knowledge of how to initiate this initial phase of a potential IAM implementation. The client has either someone from their IT department that is the issuer, or connector, for this implementation, or someone from the business itself. This contractor could in many cases be a consultancy firm, but not necessarily. Other actors could be a part of this process, e.g. a Product supplier, a vendor of an IAM solution, however, this varies from case to case. The final actor – Project Team, is usually a mix of individuals from the client and the contractor. This team has the main responsibility to drive this project forward to a possible IAM implementation to the client. The following Figure 4 visualizes a common scenario – which this thesis is based on.

![Figure 4: Stakeholders of an IAM implementation](image)

The challenges of an IAM implementation is multifaceted, often involving a majority of actors (i.e., clients, project teams, contractors and product suppliers). As the analysis of empirical data points out, the challenges can be categorized into two interrelated (i.e. not dichotomous) types: (1) common challenges and (2) change challenges. Firstly, the common challenges are described, and secondly, the change challenges are emphasized.

5.2 Common Challenges

The common challenges have three themes: Insight, Communication, and Endurance. These themes are derived from the empirical codes – the codes that were retrieved and identified from
the interviews. Empirical codes constitute into categories and their aggregation leads to themes. Figure 5 visualizes this process and offer a thematic map of the general challenges that emerge in an IAM implementation. All codes are expressed in this sub-chapter, hence not all codes are visualized in the following figure.

5.2.1 Insight
Insight is about understanding and realizing. Depending on stakeholder, and perspective, the insight might vary. It has been realized that with poor insights into the situation, it tends to entail immense challenges. In general, the theme Insight was the most frequent challenge. The reason for this could be many, however, one could be that since the client and contractor have, in most cases, not establish a relationship in earlier stages, they lack knowledge of each other and how their business operates. The theme Insight represents three main categories that were expressed, in one way or another, to be immense challenges for the client, contractor, and the project team. The identified categories are: (1) Client Ambiguity, (2) Client Prerequisites, and (3) Perspectives. Each category is visualized in a table (Table 5, Table 6, Table 7, respectively), with key representative quotes, which constitute key challenges that occur during an IAM implementation.

Table 5: Representative quotes for the category Client Ambiguity

<table>
<thead>
<tr>
<th>Client Ambiguity</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ9</td>
<td>The client does not possess knowledge of its organizational infrastructure. This makes it difficult to visualize needs and demands, because they do not really know what they need.</td>
<td></td>
</tr>
<tr>
<td>SQ6</td>
<td>This is the trick, to let the permissions/privileges vary depending on the client needs. If the organization (client), or their IT department, does not have insights into the client needs, they should not implement an IAM-tool.</td>
<td></td>
</tr>
<tr>
<td>SQ3</td>
<td>Sometimes, it is the input values, or that it does not look like according to the description, where the client may not have realized or known…</td>
<td>The client demand is not well-defined or clearly expressed</td>
</tr>
<tr>
<td>SQ10</td>
<td>Even though the client has realized the need, they still lack the insights of how it should be used, possibly, they do not really know how and what technical components will be integrated into their current solution.</td>
<td></td>
</tr>
<tr>
<td>SQ10</td>
<td>Sometimes, it could be that the client thinks that this is an IT-project, something that their IT department are working with, then this matter has no anchoring to the management and there is no connection to HR in an early stage.</td>
<td>Not an IT-project</td>
</tr>
<tr>
<td>SQ1</td>
<td>You think that this is an IT concern, but it is not. It is a concern for the entire organization.</td>
<td></td>
</tr>
<tr>
<td>SQ12</td>
<td>A risk is that the project is tackled as an isolated phenomenon. This entail issues such as understanding the bigger picture and how things and matters affect each other, this in both the business perspective but also in the IT-infrastructure.</td>
<td></td>
</tr>
<tr>
<td>SQ11</td>
<td>Many times, these initiatives are ignited from the IT department, but they lack the insights of what the client company needs... This is not an IT problem, it is a business problem.</td>
<td></td>
</tr>
<tr>
<td>SQ5</td>
<td>I think it could vary a lot, depending on who is the client (IT or Business), what demands and needs they have and how did it originate.</td>
<td></td>
</tr>
<tr>
<td>SQ6</td>
<td>It depends on who, or where the need has originated. Either it arises in the IT department or within the business. If it is in IT, then you could state that the problem has no business anchoring, it is another load or burden for IT. From an IT perspective, you usually want to improve quality or efficiency... From the business perspective, it is typically a new regulation or something else that affects how users may reach and use information.</td>
<td>Client need from IT or Business</td>
</tr>
</tbody>
</table>

The category **Client Ambiguity** emphasizes one of the biggest challenges IAM-projects experience in an early stage – a client with poor knowledge of what they really want to achieve with this new solution. The only thing that was certain, or identified, was their need for a new IAM-solution, however, they had no clue what specific demands they seek with the new solution. The poorly defined demands created barriers for the project team because they were not certain what to develop, or prioritize, if the client is ambiguous. This entails long-spun projects since it will consume time for the project team to identify what they should focus on. Most interviewees expressed the benefits if the contractor conducts a “pilot study” or “requirement analysis” – trying to realize the client need. Although it is considered as a method to facilitate the implementation, it is inadequate as a solely method to realize the client need. Therefore, the client need or demand is one of the most difficult challenges to manage in an IAM implementation.

Most of the client companies (either manager from IT or Business department) think that an IAM-project is an IT-project. However, IT is only one of the dimensions, e.g. the conjunction and integrations of different IT-solutions (HR, economics, current identity management solution, etc.), whereas dimensions of e.g. business activities and strategies are not included. Furthermore, of the 12 semi-structured interviews, 11 of them expressed that this is not an IT-project, however, only a
few of them have acted as a client – most have acted as another stakeholder. Nevertheless, respondents stated that this is, of course, a technical solution, thus involve the client IT-department, however, since the project affect the entire organization, it is rather a “Business/Corporate project”. This typical misconception place both employees’ mind-sets that this issue is something IT should deal with, and also that IT has the mandate to drive this project from their interests and perspective. The last aspect of the Client Ambiguity category can best be understood by comparing two case scenarios; Case A – the most common case, where the initiator – realizing the client need – is from the client’s IT department; Case B – a bit less frequent, where the initiator is someone from the client’s business or corporate level. With this said, there is a remarkable difference if the realized need is initiated from the client’s IT department or from the company’s top management. In case A – worst case scenario, the project is realized from the IT department, where it tends to be less anchored in the organization. This is somehow self-evident because if top management knew about the importance of the need, they should probably have initiated the project themselves. Typically, the IT department seeks to enhance efficiency – such as through automation, which in the end becomes a payload for the IT itself to solve. Therefore, some interviewees expressed that it is not strange that other entities, such as HR, do not see the purpose to be involved in this project work, because if the IT department is the initiator it will most likely, mainly, concern IT issues. In case B – the best case scenario, if someone on the business level has realized the need for a new IAM-solution, they should have a decent idea of what they seek with this new solution. However, these cases are typically issued if a new national, or international, legislation or regulation are created that will affect their business. Even though these cases are rarer than the other mentioned, these initiatives tend to involve the business and other business entities, hence positive outcomes have been found. The reason for this could be many, where some could be the integration of each other’s work and working towards a common goal. However, the result does not display any further details in how these different initiatives ended – in form of time, resources, budget, etc., only that in the initial steps of the IAM-project tend to create fewer ambiguities if the initiator is from the business and not the IT department.

Table 6: Representative quotes for the category Client Prerequisites

<table>
<thead>
<tr>
<th>Client Prerequisites</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQ1</td>
<td>We started to fetch, and investigate, current data from the current IAM-system. Based on the data, and towards the data structure that should be established, information and identity records, we found that some fields and categories had 96% error, only 4% was correct.</td>
<td>Master data</td>
</tr>
<tr>
<td>SQ3</td>
<td>Sometimes, it is a challenge to get your hand on data that is a must to have. For example, the HR source, where you need the data in a specific format, that could be a challenge, or that it is not enough with that source. Then, you need several sources that together give suitable information about an identity or user to start the IAM-project.</td>
<td></td>
</tr>
<tr>
<td>SQ11</td>
<td>A classic problem is master data – who owns what? Most clients have no clue before we arrive.</td>
<td></td>
</tr>
<tr>
<td>SQ8</td>
<td>You cannot implement an IAM-solution without master data, it is alpha and omega – most vital. Furthermore, identities are only a subset of the master data, but there are other parts of the master data you must understand and keep an eye on.</td>
<td></td>
</tr>
<tr>
<td>SQ10</td>
<td>The client has legacy systems that could be problematic to connect in a suitable way and they have not “clean/wash” their identity data.</td>
<td></td>
</tr>
</tbody>
</table>
It is quite common that a person has multiple identity representations in different systems.

| SQ6 | Typically, a “cleaning job” must be performed on the HR data, but also in the technical perspective of the Active Directory (AD)... because you realize that the client has 20% “ghost” accounts. You could find things that need to be “cleaned and washed”, before an IAM-tool can be implemented. |
| SQ8 | Over time, I have realized and gain insights into how much client prerequisites are in place, to initiate and accomplish an IAM implementation. |
| SQ1 | This does not concern IAM, but it is a common problem for the client company. I have been working with banks, insurance companies, where you might think that they should have these questions settled, but they have the exact same discussions and problems with regulations, “We think like this”, do you have that written on paper? “No”, then let’s start with that. Business processes must be set, however, that is rarely the case. |
| SQ8 | Often, it demands initial sub-projects to get the necessary client demands, and set those in a clear way, before they are mature and ready to implement an IAM-tool. |
| SQ7 | It becomes the next part of the evolution, to mature. Then, you will be able to use employee attributes, what special competences they have and let that be the underlying base for their privileges/permissions. |
| SQ1 | You have some kind of regulation and you try to investigate it. We look into what kind of governing data exists to make the regulation operational. It could be a manager that sets a demand: we want to apply for permissions, then the business must reply with yes or no in the owning of it. But then there is no information, there is no registry with the owner of information. |
| SQ8 | When you drive this in access management, when you set permission based on this data. Then the need will increase even more, because then you involve privileges that must be based on trustworthy data, then owner of data is even more important. |

The category **Client Prerequisites** continues on the same track as Client Ambiguity, with the client as the focal point. The definition of master data indicates how, or if, a client has any valid data from its current employees, the connected permissions, business processes, guidelines, rules, etc. that constitute any kind of data pool that should be beneficial for the contractor or project team when initiating the project. Typically, an IAM-solution is created from either an older IAM-solution that has become obsolete or through the client’s HR system, which should possess data from the current employees working for the company. However, this data pool, or master data, is almost always an early problem for the project team. If the client has not identified its data – beforehand, it takes a lot of time for the project team to set since master data usually constitutes more than just employee information. In most cases, the master data is unreliable, because of attributes that either lack valid information or that attributes have not been updated. This challenge connects to another code – client preparation work, which emphasizes the “cleaning job” a client must do before initiating an IAM-project, however, this is rarely performed by the client. This kind of job correlates.
to the master data and how it should be set. Even though these client preparations would be beneficial, it is not always the case that the client possesses the knowledge of doing it. Their IT-maturity tend to be a crucial factor that determines if they have the capability to perform it themselves, as well as their understanding of the problem. The maturity indicates if the organization is ready, or capable, of implementing an IAM-solution. Additionally, if the client is able to make future adjustments to the IAM-product. However, the client’s maturity tends to be inadequate. Furthermore, this is the main reason for consultancy, hence this challenge will probably always occur in one way or another. The last dimension of the client prerequisite category is the owner of the information. If the master data is set and defined, the ownership of data must also be determined. In these systems, like many others, an owner or responsible actor must take place to be able to set permissions, tracking, etc. It is necessary for e.g. monitoring or logging, if someone has violated some process or other questioned matter, someone must be responsible for this action. Owner of information is a crucial factor to define, however, most clients have not established it before the IAM-project initiates.

Table 7: Representative quotes for the category Perspectives

<table>
<thead>
<tr>
<th>Perspectives</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SQ1</td>
<td>Resource allocation has not worked, not at all. Our legacy systems are based on a different software than the new ones, but resources have been reused – not that optimal, we need new competence.</td>
<td>Resources</td>
</tr>
<tr>
<td>SQ3</td>
<td>It can be a challenge that the client does not have dedicated resources in this project. It is supposed to be done by the contractor, but the problem is that they are working with the client’s business processes.</td>
<td></td>
</tr>
<tr>
<td>SQ10</td>
<td>It is common in larger organizations that they do not possess deeper knowledge in the technical components and how systems work together.</td>
<td></td>
</tr>
<tr>
<td>SQ7</td>
<td>They do not have time. Many organizations have full packed calendars, thus it is difficult to be the (responsible) client of change and to drive that forward, when you – simultaneously, must continue with your daily working tasks.</td>
<td>The time aspect</td>
</tr>
<tr>
<td>SQ12</td>
<td>Then, of course, you have the time aspect which you cannot really affect in most cases but... it is harder to drive the project when the organization is occupied with other tasks all the time.</td>
<td></td>
</tr>
<tr>
<td>SQ9</td>
<td>The client wants a fast solution, something that can be implemented directly and easy to do so.</td>
<td>Fast and easy solution</td>
</tr>
<tr>
<td>SQ6</td>
<td>The client could continue as they are doing now, buy a product and just simply plug it in and then forget about it, or they could start digging into things... however, that is typically a tough business journey.</td>
<td></td>
</tr>
</tbody>
</table>

The category Perspectives emphasize the different angles a problem, or challenge could have. Resources is a common challenge, both in the allocation of it and if the knowledge exists in-house. One interviewee expressed their case as their current IAM-solution is based on one type of software, while the new solution is based on another software language. This indicates problems if the organization will use the same human resource to do the same job since they might not possess
the necessary knowledge to manage the new software. Resources could also be in the form of money, that the project has limited funding. The funding was a frequently observed challenge since it determines what software solutions that could be purchased and implemented – should the IAM-solution be solely developed by the project team or should some parts be purchased by a vendor (sub-contractor or product supplier). Furthermore, the time aspect is another concern. The new IAM-solution tends to involve everyone inside the client company, thus everyone must be ready to squeeze in new activities. These activities could be to understand the system, why the system is needed and how it might affect their current working situation. Unfortunately, this is rarely the case. Most managers and employees already have a full packed agenda, hence they see no reason to change their prioritization. In addition to the full packed agenda, the client perspective of having a fast and easy solution has been expressed from many interviewees. Clients do not seek to initiate business change programs, they seek something that can be plugged-in and run within seconds. Additionally, the client seeks something that deals with their current problem instantaneously, hence do not see the value creation in the longer run. The problem is that an IAM-tool is not something that is plugged-in overnight, which clients have no insight about. This lack of insight entails unrealistic goals set by the client, which becomes a challenge for the contractor to facilitate (or change the mindset of the client).

5.2.2 Communication
Communication is about how stakeholders, and systems, communicate with each other and how they could create an equal ground, to possibly create an agreement with each other. Additionally, Communication emphasizes the challenges with the influence of an external player. It should be noted that this communication does not concern communication challenges within the project team. Instead, the findings emphasize challenges when communication is occurring between different stakeholders and communication between different business entities inside the client company. The theme Communication represents three categories which were expressed as challenges for the client, contractor and the project team. The identified categories are: (1) External Influences, (2) Connecting and (3) Agreement. Each category is visualized in a table (Table 8, Table 9, and Table 10 respectively), with key representative quotes, which constitute key challenges that occur during an IAM implementation.

Table 8: Representative quotes for the category External Influences

<table>
<thead>
<tr>
<th>External Influences</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ3</td>
<td>This is a classical issue, when a project will go over to administration/management, or is it still in development? You will never be done unless you limit your delivery.</td>
<td>Administration</td>
</tr>
<tr>
<td>SQ11</td>
<td>It is like you have a life-long relationship with the client because you cannot really have a full handover. When any problem arises, the client will contact you to solve it (because they do not have the competence...)</td>
<td></td>
</tr>
<tr>
<td>SQ7</td>
<td>If client management/administration is missing at the beginning of the project, if it is not yet defined who will use this new system when the project “closes”, it becomes a huge problem for the individual that receives a quick and last-minute handover of the solution.</td>
<td>Handover</td>
</tr>
<tr>
<td>SQ11</td>
<td>It is common that the handover gets tricky, there is no receiver. The client does not afford it, or they choose not to prioritize to build up their knowledge base in parallel with the project team.</td>
<td></td>
</tr>
<tr>
<td>SQ1</td>
<td>There has been (1) no understanding, (2) no interest, and (3) no financing. That we have pushed forward with our “left hand”. This is hard, the hardest project actually, for us as external staff, to drive this question forward.</td>
<td>Being external actors</td>
</tr>
<tr>
<td>SQ10</td>
<td>It would be difficult for a consultant to only focus on communication. I think that the effort of communication will still be overrun by specialists and project leaders because you still want to reach out to those that possess most knowledge about the problem.</td>
<td></td>
</tr>
<tr>
<td>SQ12</td>
<td>It is a challenge to sell, or convince, the client to realize the business needs, which could create new ways of working, a higher price and another time frame than was anticipated.</td>
<td>Sell/pitch the idea of solution</td>
</tr>
<tr>
<td>SQ7</td>
<td>It can be a challenge with the “silo” approach. Here, it is vital to push the process of change forward and to sell it as a positive thing.</td>
<td></td>
</tr>
<tr>
<td>SQ2</td>
<td>To sell an architecture, you must possess an understanding in the client business management, thus it is extremely important to have any kind of decision-making privilege, either to work closely with the CIO/CISO, where you address on technical and compliance needs.</td>
<td></td>
</tr>
<tr>
<td>SQ11</td>
<td>That is a classic. When you start to lift all “rocks”, then the client also starts to realize the complexity of this implementation, that it might be too much for them.</td>
<td></td>
</tr>
<tr>
<td>SQ7</td>
<td>I think it is common, where you have chosen to “close your eyes” for these kinds of problems, both from the client and contractor. In those cases, it might evolve into a gigantic problem.</td>
<td>Withholds information</td>
</tr>
<tr>
<td>SQ6</td>
<td>This is always the case, always, because of different reasons. If I sell products, I will never disclose the truth, because my aim is to sell the product… however, we, from a service/contractor perspective, withhold details about the challenges, because otherwise, nothing will happen. The client will think that it is overbearing.</td>
<td></td>
</tr>
</tbody>
</table>

The category **External Influences** emphasize some challenges a contractor could experience, or influence, but also the potential downside of being an external actor doing this kind of work. The code administration expresses the concern when a client has received a solution but still need someone to help them with certain matters – if or when the system becomes unreliable. If the handover has been seamlessly performed, which is rarely the case, the client still counts on the contractor to aid them by administrating the IAM system since they developed the software. However, this varies from case to case, since some organizations have educated their employee's over time – during the IAM-project implementation, but most do not, which indicate a problem and a so-called life-long relationship between the client and contractor could be established. It should also be stated that this finding assumed that no administration agreement was stated in the contract between client and contractor. Nevertheless, the handover could be problematic if a clear and identified receiver has not been determined – lack of communication. In most cases, the receiver is the client, however, some interviewees expressed that this could be an immense challenge for the project team if this is not set during the development of the IAM-solution. Although it is more common that someone on the client side, or a few selected individuals, receives a last-minute handover of the system, which could either be because of the client had a poor planning or that the contractor saw their work to deliver a solution – not to learn the client. In any
of the cases, the problem relies on the client’s lack of knowledge to utilize the new system since the handover should not be for only a few days – or even less. With their deficient competence, it becomes unsustainable for the client company to develop and maintain the new system, hence the administration relationship is a common challenge in IAM constellations.

One vital challenge of being an external actor is to drive this type of project forward, without any help from internal employees. Since an external individual, typically a consultant, will leave the organization when the project is done, external actors tend to receive less attention and embrace. Another challenge for external actors is how they sell/pitch their idea to the client. Different methods of selling have been conducted, but most interviewees have expressed concerns on how to sell something to the client. It is difficult since many IAM functionalities and benefits are expressed as non-functional, which is rough to visualize to the client. If a possible contractor cannot persuade the client to purchase their idea of a solution, no project will be initiated. Some expressed the usage of Single-Sign On (SSO) when selling the IAM solution since it clearly displayed some enhancements in the user experience. However, the focus could possibly have been more targeting on signing a contract, instead of trying to understand the client’s poor attempt to realize their need and requirements.

The last dimension in this category, interrelated to the previous code of sell/pitch an IAM solution, is that contractors, occasionally, withhold information about the complexity of the implementation. The complexity in the client’s infrastructure – e.g. how current systems are integrated or how the data flow is generated. This is typically experienced by the project team during their work since they will realize – over time – what systems that communicate with each other, thus must be either included or excluded (dismantled) to the new IAM-solution. However, usually, this takes time. The biggest challenge is when the contractor has realized this complexity and decides to not share all detailed information about it to the client, because they fear that the client will think it will be too much to overcome and hence will not invest in the contractor’s idea of a solution. This can solely be one of the main reasons why IAM-project tends to exceed both time planning and resource allocation. Most of the interviewees have acted as a contractor stakeholder, hence this could arguably be valid and an accurate finding. Additionally, if the client does not understand the problems with the implementation, they will have difficulties to both help the project team with their development and to support them with necessary resource since the client will budget for the project before it is initiated.

Table 9: Representative quotes for the category Connecting

<table>
<thead>
<tr>
<th>Connecting</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ4</td>
<td>It is vital to understand the integration of different systems. If that fails, everything fails.</td>
<td></td>
</tr>
<tr>
<td>SQ5</td>
<td>Typically, there is a lot of different aspects that apply to an IAM-project – what is needed, but often you do not have enough knowledge, from both the client and contractor perspective, in the client systems that must be integrated.</td>
<td>Integration</td>
</tr>
<tr>
<td>SQ11</td>
<td>IAM are typical systems that must be integrated with the core business systems that the client has, and there must be an interest for them to be connected… If that is not set, no progress will occur. That is important to have in mind.</td>
<td></td>
</tr>
<tr>
<td>SQ2</td>
<td>It is important that the client understand this… Either you take a central grip and place us above these workplaces/entities that have nothing to do with IAM but must go to each one and deliver something. I think this is lacking when planning the project.</td>
<td></td>
</tr>
<tr>
<td>SQ8</td>
<td>It is outdated, it does not work. It contradicts each other. You are supposed to drive your own parts, but you should also use the central products… IAM is centralization, usually.</td>
<td>Centralization</td>
</tr>
<tr>
<td>SQ5</td>
<td>I have experienced, in some cases, that business segments/entities are very divided, and they have no insights into each other processes, but then you are supposed to get them connected… they have lived in different worlds. This entail problems, to connect everything, which takes time.</td>
<td></td>
</tr>
<tr>
<td>SQ1</td>
<td>When an IAM-tool is pitched for the client, it is usually done by some product and a visual demo… the client does not understand all relationships between regulations. To make regulations implementable, master data is needed where regulations are based on the master data, otherwise, there will be nothing.</td>
<td>Regulations</td>
</tr>
<tr>
<td>SQ2</td>
<td>Insights in the business management… where you address the technical requirements to ensure regulatory compliance. This is vital, otherwise, the client will not understand this.</td>
<td></td>
</tr>
</tbody>
</table>

The category **Connecting** express challenges when connecting several actors, or aspects, together. Since an IAM-solution affects all business entities, because of its centralization approach, this type of challenges will almost always occur for the client (unless its infrastructure already is centralized or if they are working more process oriented). To further emphasize this challenge, one respondent (SQ1) expressed it like:

“If you are an Administrative manager for an economic system, you only have the economic system to deal with. But, if you are an Administrative manager for an IAM-system, then you have: the economic system, personnel system, add integrations to that, federations in and out of the company, directory services, and the entire AD. That is a lot. You must have a helicopter view, not detailed oriented.”

This statement connects to both integration and centralization, which have frequently been stated in several interviews. Integration could be seen as a more technical aspect, in the sense that systems must interact or communicate with each other to fulfill most of its tasks. System integration is further essential because if any system fails, it will affect the entire chain. One key aspect that has been observed is the clients lack in understanding system integration. They lack competence in how their current systems are set, and how and why systems are communicating with each other. This entails challenges for the project team since if the client does not know, they must tackle this problem themselves and find the purpose of the system integration. Some interviewees stated that many client’s infrastructures had systems that interacted without any reason and without their knowledge.

The centralization is another frequently mentioned challenge since it is about making something in a central, and standardized, way. Usually, the client does not understand this, in an early stage, they just know that their current way is not working. To make a standardized method even possible, business entities must be willing to understand each other and communicate, because they are usually living and working in different worlds. However, this effort of centralizing is a huge challenge to overcome. The so-called Silo approach is something adding to this problem. It refers
to that business entities usually work in silos, isolated from other business entities, creating difficulties to interact or integrate with each other. Few companies – according to the findings – are working process oriented, which could be beneficial when an IAM implementation emerge. Although the real challenge relies on the fact that business entities have never had a need to interact or work with each other in this magnitude before. However, to facilitate the IAM implementation, or even make it possible, they must be more interrelated and connected with each other. If they do not settle for a centralized working approach, it will create later problems when the IAM solution is completed and the project team ceases to exist, where the solution should be implemented and used. One interviewee expressed his/her experience where the client received the new IAM solution but did not start to utilize it. Instead, they continued with the old and obsolete solution. Nevertheless, a few interviewees expressed the vital challenges when a client has independent departments inside the company – they work as independent organizations but have the same company name. This is common in government authorities, which adds an extra layer of problematics to create a centralized working approach. Since they have their own systems and working, as well as their definition of business process and routines, to implement an IAM solution that must integrate with all core systems (with all independent authorities) where all users agree on how to use, maintain and develop the system, is by far the biggest challenge for those government authorities.

The last dimension in this category, a bit different from the previous codes but still affects all parties inside the client company, is regulations. One purpose to implement a new IAM-solution is to manage new regulations – which the client usually knows, however, what the client rarely understand is the consequences in their lack of insights and communication that influence the outcome of ensuring regulatory compliance. The integration of systems has further importance to ensure that the organization comply with regulations, as well to set appropriate rules, processes and employee permissions, which in many cases are not well-defined. If a regulator authority wants to investigate the client’s employee permissions and privileges, it should be well-defined and clearly expressed why a certain user has that permission, otherwise, the client company could experience penalties.

<table>
<thead>
<tr>
<th>Agreement</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ5</td>
<td>It is important to get acceptability from top management, so employees realize that this is supposed to be done… so they do not think it was set by someone “with less authority”.</td>
<td>Acceptability</td>
</tr>
<tr>
<td>SQ4</td>
<td>It is critical to get acceptability from the concerned actors, why you must do things in a certain way.</td>
<td></td>
</tr>
<tr>
<td>SQ6</td>
<td>To agree on things and what they should mean, through a business perspective (sigh), and to mix HR into this that usually owns identity information… that is a business journey to do.</td>
<td></td>
</tr>
<tr>
<td>SQ8</td>
<td>There are a billion different ways to define an organizational structure and for the organization to agree on its structure, in relation to agreeing on concept names… ridiculous example but you will avoid three extra email threads when employees ask, ‘What does entity mean?’.</td>
<td>Agree on issues and matters</td>
</tr>
<tr>
<td>SQ9</td>
<td>For the client to find a common working approach, that is a huge challenge.</td>
<td></td>
</tr>
</tbody>
</table>
We have been consistent with what should be included in the IAM-system (e.g. it is NOT an HR-system). The client had ideas to add new things into the system, but we said no from the start of the project.

To succeed, it is vital to not take in new demands from the client.

The category Agreement emphasizes the vital concept to agree with others. If, or when, the IAM implementation executes, organizational and individual changes will occur, hence it must have high acceptability from both top management and client personnel. Without high acceptability, interviewees have expressed concerns that employees tend to prioritize their work against the change, or the new implementation, and appear a bit resistant to the IAM-project. Therefore, agreeing on change – and how it affects their current working situation, or other matters, is key to master. One specific aspect that has been observed is the difficulties to decide on what things should mean – their definition. One example could be the definition of employee titles, another is business processes. Since IAM is a centralized solution that uses standardized methods, all business entities must agree on routines, processes, guidelines, etc. where no entity can do it differently and still be able to utilize the IAM solution as everyone else. Therefore, agreeing on what things and matters should be named is a ridiculously big challenge. Finding a common working approach, where things are named the same way, should not be such a big problem. However, many interviewees have expressed that they are working with humans, thus this kind of problem is accepted to be this way because humans tend to dislike changes or to do things differently – especially when business entities have a bad relationship with each other. A typical example of bad or stiff relationship is between a client’s IT and HR department. The reason for this could be many, however, many interviewees expressed it that there has never been a need to cooperate before, not in this kind of magnitude.

The last dimension in this category is when the client company expresses new demands to the project team. Usually, this entails pressures to the project team, where they feel obligated to add these new demands. However, it is paramount that these new demands are not included in the project. The reason is that this tends to create more and bigger challenges for the project team – they already have several other issues that must be addressed and solved. These challenges could be added to the list of reasons to why IAM-projects never hold estimations, planning or budget. In addition to the challenge when the client expresses new demands, new demands tend to be the closes connection to an IAM-project failure. Most interviews have expressed that IAM-projects not fail because clients that have realized the need to manage their identities and permissions will have the same problem and need if the project is evicted. Hence, the project team tends to keep the reliance or trust to fulfill the project. However, a few interviewees have also expressed the concerns if an IAM-project failure would occur, one potential reason would be if the project team accepts new demands that will drown the project in new and challenging activities.

5.2.3 Endurance

Endurance is about how, and if, the client company has the energy, effort, and willingness to withstand a full-scale IAM implementation. Most, if not all, IAM implementation entails long-spun projects, with new unaware obstacles frequently emerging, which will test the client company’s strength. The theme Endurance represents two categories which were stated as challenges for the client company and project team. Most interviews expressed concerns where a client’s endurance was questioned, mainly because of all the uncertain and uprising challenges that occur during the
project work – which is almost impossible to plan for. Additionally, the organizational and individual changes that emerge (these findings connects with the theme 5.3.2 Vision). The identified categories are: (1) Starting and (2) Leading. Each category is visualized in a table (Table 11, Table 12, respectively), with key representative quotes, which constitute key challenges that occur during an IAM implementation.

**Table 11: Representative quotes for the category Starting**

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ11</td>
<td>Think big but start small, otherwise, you will never start, which is very common. There are so many things you must tackle, you do not have the strength or endurance to take on them all simultaneously, and where should you start?… This way might not end up with the most accurate paths, however, you have at least done something that could be modified.</td>
<td>Start working</td>
</tr>
<tr>
<td>SQ7</td>
<td>You must start somewhere, start in one end, it is totally necessary. Even though it might end up with more work than anticipated, it is the right decision to start with something and to tackle the problem.</td>
<td></td>
</tr>
<tr>
<td>SQ11</td>
<td>Think big and start small, otherwise, you start nowhere, which is very common.</td>
<td>Too big start</td>
</tr>
<tr>
<td>SQ10</td>
<td>Do not start by doing too much, do not try to solve all problems in some kind of “Big-Bang”, that will rarely have a good outcome.</td>
<td></td>
</tr>
<tr>
<td>SQ6</td>
<td>This is a prerequisite. I usually express it “release-anxiety”… Our strategy to reach the goal: First delivery – we work with this, second delivery – we try to meet other demands from other business entities.</td>
<td>IAM delimitations</td>
</tr>
<tr>
<td>SQ5</td>
<td>It is more common to limit the project’s scope, choose a subset of needs and try to work with the other parts later.</td>
<td></td>
</tr>
</tbody>
</table>

The category **Starting** express the essence of starting the project work, and not to start too big. A few interviewees expressed that you must start somewhere, it does not matter where, as long as you start with something. They also stated that if things do not go as intended, it will be modified in a later stage. Those respondents emphasized that if the project team wait too long, to start with the most suitable project activity or milestone that, according to the client, is of the highest value, the implementation will take too long. This challenge, to start with a suitable milestone, could turn out to be one of the biggest challenges for the business endurance. Another challenge is not to start too big. A few interviewees stated that starting with something too complex and too big rarely result in something profitable. Most interviewees have used the wording of: “Think big and start small”, which indicate the importance to tackle this type of challenge. Despite the findings in how to start, a big majority of the interviewees indicated that an IAM solution must be delimited. Typically, the outcome is that an initial version 1 is launched and a possible version 2 might be initiated depending on what features that the first version included and how well it met the client’s expectations and needs. This approach or method serves the purpose to address the endurance challenge in an appropriate way – regarding the otherwise possibility of a long-spun project, however, other challenges emerge. These challenges could be: (1) was a delimited version 1 communicated to the client in the first place? (2) did version 1 meet the client expectations and needs? (3) what were the reasons for not implementing the entire IAM-solution in the first place?
These challenges connect to the code centralization, where one interviewee expressed – as already mentioned – the possibility of a dissatisfied client that did not start to utilize the new IAM solution because it did not meet the client’s satisfaction level.

Table 12: Representative quotes for the category Leading

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ12</td>
<td>To make the client understand, that this is needed. To present a business case to get mandate to initiate this business journey.</td>
<td>Mandate</td>
</tr>
<tr>
<td>SQ11</td>
<td>Because this was not anchored in the organization, it was important before, but then the system was not further developed over time, maybe because the responsible leader/administrator did not drive it forward or because he/she lacked the mandate to do so.</td>
<td></td>
</tr>
<tr>
<td>SQ4</td>
<td>To get acceptability to change the culture… there are weak managers but then there are managers that constantly are swapped out, which becomes a problem.</td>
<td>Leaders come and go</td>
</tr>
<tr>
<td>SQ1</td>
<td>We have had four different IT-management leaders during the project’s timeline (so far).</td>
<td></td>
</tr>
</tbody>
</table>

The category **Leading** emphasizes the importance to get mandate, to make appropriate decisions that others will listen to, as well as the challenge when leaders constantly leave the project team. To get mandate is vital for any leader and a presumed privilege for many. The problem, that a few interviewees stated, is that when leaders do not have mandate – either in the project team or inside business entities, employees will not listen to their attempt of leading. Without mandate, no one will know who to follow and why they should follow. Another challenge, linked to leaders, is when leaders leave the project team or business entities. A few interviewees expressed their concerns when a leader that drives the project team forward must leave the team or a manager inside a client business entity that has been highly active in the project work. If this is a one-time occurrence, no greater harm will be experienced, however, when two or three different leaders have left the team, or business entities, during the IAM implementation, it will create negative outcomes to the project. Additionally, this challenge could entail communication problems since new members must be up to date with the project progress, where they might not realize the importance of the project as previous managers. Leading employees is a frequent key aspect that most interviewees have expressed, however, nothing that is taking for granted. Leaders are someone that any environment is highly in need of, however, leaders must be given suitable tools to perform their work, otherwise, no one will drive the progress forward or in a suitable trajectory.

5.3 Change Challenges

The change challenges have three themes: Anchoring, Vision, and Communication. These themes are derived from the empirical codes – the codes that were retrieved and identified from the interviews. Empirical codes constitute into categories and their aggregation leads to themes. Figure 6 visualizes this process and offer a thematic map of the change challenges that emerge in an IAM implementation. All codes are expressed in this sub-chapter, hence not all codes are visualized in the following figure.
5.3.1 Anchoring
Anchoring is, mainly, about how to get dedicated support from management and employees. Since an IAM solution tends to create organizational and individual changes, these changes must be supported by anyone affected by the change. The theme Anchoring represents two categories which were expressed as challenges for the client company and project team. Most interviewees express the importance of having a solid anchoring in the client company, which constitute the underlying base on why certain changes are occurring. The identified categories are: (1) Stiffness and (2) Resistance. Each category is visualized in a table (Table 13, Table 14, respectively), with key representative quotes, which constitute key challenges that occur during an IAM implementation.

Table 13: Representative quotes for the category Stiffness

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ4</td>
<td>The culture is created together, therefore you need acceptability to change it.</td>
<td>Corporate culture</td>
</tr>
<tr>
<td>SQ9</td>
<td>The client must have the energy and effort to make this change. Too much change, at the same time, could create immense challenges to a company because of e.g. its culture.</td>
<td></td>
</tr>
<tr>
<td>SQ12</td>
<td>It is a “journey of change” that affects many. If an employee does not understand why and how, why you are supposed to work in certain ways, why this is a business project and not IT-project, it this is not understood, the change is not anchored.</td>
<td>Journey of change</td>
</tr>
<tr>
<td>SQ2</td>
<td>It is not uncommon that an organization waits to initiate the change process because of older personnel that, most likely, will not make this type of comprehensive change, thus the company will wait until they leave or retire.</td>
<td></td>
</tr>
<tr>
<td>SQ8</td>
<td>Legacy systems, “kill your own darlings”, people have developed these systems by themselves, they do not want to adapt towards standards and guidelines.</td>
<td>Legacy systems</td>
</tr>
</tbody>
</table>
Legacy systems are one of the most challenging parts of integration, where these legacy systems do not have standardized communication protocols and tend to execute a bit odd.

The category **Stiffness** indicates the rigidity of corporate culture, how difficult it is to change it, and the “journey of change” that an IAM implementation create. A few interviewees clearly expressed the challenge with corporate culture – “How we do things around here”, that it is created together inside the company and it needs high acceptability to change it. Others also expressed that the energy and effort cannot be understated since a corporate change is one of the biggest challenges a company can initiate. The so-called “journey of change” must be anchored, otherwise, it is uncertain where the company is headed. Client employees must realize the need for change and where they fit and contribute to this process. One extreme case has been stated from one interviewee, where a company waited to initiate the IAM-project because of old personnel that soon would retire. Top management feared that they would not manage this kind of change, hence to wait a few years seemed to be the most appropriate way.

Another challenge to the corporate stiffness is legacy systems. Although it addresses more technical aspects – system integration aspects. However, those that developed a legacy system tend to dislike the changes since their “heritage” or “darlings” will be erased. They will also have a difficult time realizing their new place in the change, especially if they have acted as system coordinator or system maintenance and the new system is based on another system language compare to the old system.

Table 14: Representative quotes for the category Resistance

<table>
<thead>
<tr>
<th>Resistance</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ5</td>
<td>Resistance will always pop-up when changes occur because individuals want to work as they are used to. Therefore, it is vital to express the benefits, such as improvements and simplifications (in current tasks), this will create to the organization.</td>
<td>Where do I fit/serve a purpose?</td>
</tr>
<tr>
<td>SQ6</td>
<td>Depending on the IT or Business perspective, resistance occurs differently. From the Business perspective, the biggest resistance is agreeing on things, definitions, and such. From the IT perspective, it is the distrust of the Business ability to unite and agree… this could punish the organizational change.</td>
<td></td>
</tr>
<tr>
<td>SQ12</td>
<td>Employees do not see or understand their place in this change.</td>
<td></td>
</tr>
<tr>
<td>SQ11</td>
<td>People do not like changes. Sometimes, it could happen that if you have worked with permissions you will have to work with something else later. Thus, this could develop to a sensitive question, if employees that have worked in the company for many years.</td>
<td>Sensitive issue</td>
</tr>
<tr>
<td>SQ10</td>
<td>People become resistant because they are not comfortable with doing things differently. They could be insecure about losing their job because they are not really needed anymore.</td>
<td></td>
</tr>
</tbody>
</table>

The category **Resistance** emphasizes some classical challenges when changes appear. The typical mindset of: “Why change?” or “Where do I fit in this change?” has been expressed in almost all interviews, indicating the challenge to change individuals’ mindsets where change should be something positively associated. This matter could potentially turn out to be a sensitive one, a bit connected
to the last section in the Stiffness category. A few interviewees have stated resistance from those that have developed, by themselves, the current IAM or identity management solution a client has. The phrase “kill your own darlings” has been expressed, which is a huge challenge for the responsible actor within the client company and the project team to persuade those individuals. Most interviewees have stated that the advantageous of the new IAM-solution cannot be understated. Things such as SSO, increased efficiency, enhanced security, etc. must be clearly communicated in an early phase of the project to hopefully persuade everyone within the client company. Despite those that have developed a software solution, resistance is usual when personnel do not see their place in the change or when the change has been accomplished. Additionally, they do not understand, or chose to neglect, the fact that the organization need change. They prioritize their own needs, thus ego, which becomes an immense challenge for any change program in any constellation. IAM-projects initiate organizational changes because it affects everyone inside a company, which client personnel typically lacks insights of.

As the category Stiffness briefly touched upon, when people do not see their place in this process of change, they fear to be fired or replaced. If they are not fired, they might end up working with something totally different compared to their earlier tasks, which they might not be satisfied with. Therefore, it could turn out to be a sensitive issue for managers to decide what to do with those that resist the change. This entails further challenges for the client company, for example how to communicate this change and how business entities will be affected. Additionally, why business entities should agree on this change – what is it for them? Further, what they could do to get along with the changes. In the end, most interviews indicated that changes are not warmly welcomed, and most do not have enough insights into why the change is needed.

5.3.2 Vision

Vision is about setting an organizational goal, where everyone inside the client company must work towards the vision. Typically, a vision must be anchored in the client company to be effective enough to influence managers and employees to work with it. The theme Vision represents two categories which were expressed as challenges for the client company, contractor and project team. The vision, or goal, usually connects to the change aspects since the goal and purpose of a change must clearly be set and explained. Most interviewees expressed that this is a challenge for all participating actors since the vision is something that must be short, easy to understand, and always be obtainable. The latter emphasize if employees are uncertain about why they do things in a certain way – to ensure that they work towards a common goal. The identified categories that constitute the theme Vision are: (1) Strategy and (2) Inclusion. Each category is visualized in a table (Table 15, Table 16, respectively), with key representative quotes, which constitute key challenges that occur during an IAM implementation.

Table 15: Representative quotes for the category Strategy

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Respondent</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SQ6</td>
<td>The vision, or goal, is the underlying foundation for all work… you cannot express this too much, it is essential, but then it would be beneficial to have meetings to brief it and upload it on the intern network… it must be communicated, otherwise, no one will know why this is important.</td>
<td>Objectives</td>
</tr>
<tr>
<td>2</td>
<td>SQ1</td>
<td>Since this journey is very crooked, it is essential to have clear goals. We did trial and errors to realize what works and what did not.</td>
<td></td>
</tr>
</tbody>
</table>
This way, we occasionally had to adjust, but we have never ended in
the “ditch”.

<table>
<thead>
<tr>
<th>SQ8</th>
<th>Pre-defined demands, this, usually, requires initial sub-projects to set and decide these demands before you are mature enough to implement an IAM-solution.</th>
<th>Milestones connected to business benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ1</td>
<td>To realize the benefits with the change, it must be motivated by business benefits, however, occasionally, they have no choice to change, because their current system is obsolete.</td>
<td></td>
</tr>
<tr>
<td>SQ5</td>
<td>I think that how to deal with the process of change depends on communication and education. Those parts will influence the outcome if it is received positive or negative.</td>
<td>Education is lacking</td>
</tr>
<tr>
<td>SQ10</td>
<td>An intern communicator is vital so the organization will embrace this change. This could connect to education, to educate administrators that will use these systems, maybe educate a “help desk”… This kind of communication/work easily gets forgotten.</td>
<td></td>
</tr>
</tbody>
</table>

The category **Strategy** emphasizes the essence of having a clear strategy when initiating an IAM implementation, where objectives must be communicated to all involved parties. Most interviewees expressed the importance to communicate the vision through different business channels. In addition, a few expressed that it should be flexible to adjust the vision, because of many uncertainties that arise in an IAM implementation. Furthermore, project milestones – divide the project work into sub-parts, should be connected to business benefits, if not, it becomes a huge challenge for contractors, or the project team, to sell their idea to the client. The client needs to clearly see the benefits they will gain when a milestone is completed. If that is achieved, resources can easier be placed and planned to certain project actions or activities since the client will know what benefit it will create. However, a few interviewees expressed the advantageous situation if each milestone was independent of each other since it tends to be easier to display business benefits compare to if milestones are dependent on each other.

Another dimension in this category is the lack of education, which partly connects to the previous category resistance, where interviewees expressed their concern if resistant personnel is not educated in the new system. By educating them in an early stage, this could potentially display the advantages by implementing the new IAM-solution, thus hopefully change the individual’s mindset from resistant to encouraging. In the strategy category, it is essential to have established a strategy that includes educating the end-users that will use this IAM-solution (usually the client personnel). If this is not identified, challenges will most likely arise in the form of resistance, because the employees lack the insights and understanding of this change. In addition, this does also concern the vision since if the client company has not clearly visualized a roadmap for employees to follow, it becomes difficult for them to realize which path to take.

The last aspect in this category is that the vision can either be created by both the client personnel and the top management for that company, or it could have a top-down approach, where the client’s top management decide what goals, or objectives, they have with this change. This question created divided thoughts from the interviewees. A slight majority emphasized to set the vision together, however, some of those expressed that the top-down approach does not have to be a negatively associated method. They all expressed its importance to create a simple and easy-to-understand vision which should be accessible in any situation.
The category *Inclusion* emphasizes the vital aspect to include everyone in this process. Even though a vision can be set with a top-down approach, it must be achieved together where everyone must participate and contribute. Challenges arise if top management push, or squeeze, changes in personnel’s throats – not literally speaking. Instead, they must convince employees to participate – on free will, to feel included where everyone affected by the change should feel embraced to work with the change together. To tackle this challenge, leaders must show the way, otherwise, employees will be uncertain how to best participate and if they have a purpose to be included in this constellation.

5.3.3 Communication

This Communication theme has many coherent aspects with 5.2.2 Communication. The main difference is that this theme displays the findings from the change aspects, not solely with common challenges that emerge in an IAM implementation. The theme Communication represents two categories which were observed as challenges for the client and project team. The identified categories are: (1) Leadership and (2) Interplay. Each category is visualized in a table (Table 17, Table 18, respectively), with key representative quotes, which constitute key challenges that occur during an IAM implementation.

### Table 16: Representative quotes for the category Inclusion

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ3</td>
<td>It is important that you do not squeeze this change in their throat, they should have something to say about it, to give their input at least… they should feel that they participate in this journey.</td>
<td>Participate</td>
</tr>
<tr>
<td>SQ1</td>
<td>Things should be owned by either IT or Business, but that is not always the case, however, internal resources should be used more efficiently, for example through competence exchanges.</td>
<td>Together</td>
</tr>
<tr>
<td>SQ11</td>
<td>This is very interesting. It should be most advantageous by creating the vision in a bottom-up approach or creating it together… Occasionally, it is good to have it top-down, however, the best-case scenario would be to include all employees in an early stage.</td>
<td>Together</td>
</tr>
<tr>
<td>SQ6</td>
<td>The vision should be anchored, put together with IT and Business – everyone should participate, and have a buy-in – this is where we are heading.</td>
<td>Together</td>
</tr>
</tbody>
</table>

### Table 17: Representative quotes for the category Leadership

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ4</td>
<td>It is with knowledge, competence but also with strong and clear leadership… Weak and unclear leadership is not good, however, it must be pedagogical.</td>
<td>Unclear or weak leadership</td>
</tr>
<tr>
<td>SQ7</td>
<td>Responsible managers could create some oppositions, since they do not want to take responsibility to order and set correct permissions, upload to the correct permission group, set policies, etc… it lacks competence and it is something that they have not worked with before, thus it is likely that this is pushed to someone else, e.g. the IT department.</td>
<td>Unclear or weak leadership</td>
</tr>
</tbody>
</table>
Another vital part in leadership is to have a high participant in the change process, partly visible to the rest of the business – not just sign the contract… above all, to create the feeling inside the company that this is something we are doing together.

To get acceptability on this change from employees is vital… This is not about a “one-time activity”, this must be explained and anchored. Leaders must take discussions, difficult ones, that will occur during the journey, and they cannot get tired, the must endure.

The category **Leadership** expresses the importance of having well-defined and clear leadership, this to facilitate the communication between business entities or between the project team and the client. Many interviewees highlighted the challenges that occur when the leadership is weak and not pedagogical. Weak leadership could also be that leaders do not want to lead, or take responsibility and work with change – which could lead to poor decision making. This entails immense challenges for the project team since it might be something they cannot influence (e.g. leaders inside the client company). Another, equally important aspect is to include leaders in the process of change. Many interviewees emphasized managerial participation, that it is crucial if others should follow the change. Some interviewees expressed similarities with parenthood, where you cannot tell someone to do something if you are doing it differently. “Lead by example” and “old fashioned leadership”, are some expressions that have been collected from the interviews.

**Table 18: Representative quotes for the category Interplay**

<table>
<thead>
<tr>
<th>Interplay</th>
<th>Respondent</th>
<th>Representative Quotes</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ12</td>
<td>SQ11</td>
<td>Without a responsible individual that communicates within the organization how IAM will improve your current situation, no one will know what it is all about. Is it technology, processes, or what?</td>
<td>Communicator / Champions</td>
</tr>
<tr>
<td>SQ10</td>
<td>SQ8</td>
<td>IAM is very wide and broad, it is not enough if top management has agreed on initiating this IAM-project – change since it will affect EVERYTHING that has with identities and permissions, which is almost everything in the organization. Therefore, you need “Champions” that advocate this change, it is key, otherwise, this change will not work.</td>
<td>Hearing</td>
</tr>
<tr>
<td>SQ6</td>
<td>SQ10</td>
<td>Any kind of communication is important in an early stage, how an employee will be affected of this system, otherwise, it will be difficult to get the system earmarked for those who actually will use the system.</td>
<td></td>
</tr>
<tr>
<td>SQ9</td>
<td>SQ6</td>
<td>You will be affected by this change, therefore it would be good if I could say: “We are doing this and these areas and processes will be affected, where you are working. And we think that this will affect you in this way… We need to get confirmation from you, and feedback, from your perspective in this matter”.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SQ9</td>
<td>The best way to handle resistance is to get a hearing from top management.</td>
<td></td>
</tr>
</tbody>
</table>
The category **Interplay** emphasizes the purpose with so-called “Champions”, why they are always needed in any process of change, and the aspect to get hearing. Most interviewees expressed the challenge of communication both inside the project team and the client company but also the communication with each other. The so-called Champions are individuals that advocates changes, that encourage changes and constantly communicate the positive outcomes of a change inside the entire organization. In IAM implementations, many interviewees expressed the benefits of having Champions, or at least some responsible communicator that frequently communicate e.g. the progress of the IAM-project or the changes that will affect client employees. In addition, a few interviewees expressed the requirement of a Champion since it facilitates several aspects that are considered as “quick fixes”, although a Champion is more rare than common to have. However, interviewees raised concerns if the project team lacked a communicator since the magnitude of the project is vast and affects everyone.

The other code in this category is hearing, which refers to the essence to get a positive response when something is processed. One main aspect is to receive feedback from those that will use the new IAM-system. A few respondents expressed the early stage by communicating the change to certain business entities – how they will be affected, but respondents also emphasized the importance to receive feedback from the end-user. This to get greater insights into their current working and what the project team could possibly modify in the new, under developing, IAM-solution. This way, the end-users could feel included, as the previous category emphasized since they will realize that their feedback modified the upcoming solution. However, this is a challenge since the feedback might not be what the project team is looking for. Lastly, hearing is a general challenge for any change, or initiative, since it is about fetching someone’s interest into doing something – change, and since most people do not like to change, it is something all project teams constantly are working – struggling, with.
6. Discussion

This chapter revisits the findings and provides some discussions with prior literature. To structure these discussions, three sections are developed. First, section 6.1 gives a general overview and a description of Figure 7. Second, section 6.2 emphasizes the common challenges and what parts that agreed or disagreed with prior research. Third, section 6.3 emphasizes the organizational change challenges and a comparison with prior research.

6.1 Overview

The purpose of this study was to investigate challenges in IAM implementations, both challenges addressing general and project aspects and the challenges that emerge in the process of change inside a client company. The empirical findings displayed three themes in each area that were considered to be the most frequently mentioned and biggest challenges to manage. The so-called Insight-Communication-Endurance (ICE) challenges is the constellation of the emerged common challenges. These challenges address the first research questions, hence displayed the barriers a client must tackle in an IAM implementation. The other Anchoring-Communication-Vision (ACV) challenges is the constellation of the emerged organizational change challenges, where these challenges address the second research question.

The empirical findings are relevant and complementary for previous research on IS/IT projects (e.g., Fitzgerald (1998), Willcocks and Feeny (2006), and Kirsch et al. (2002)) for two main reasons. First, in most of prior literature on IS/IT or outsourcing projects, the scholars have often considered a relatively low number of stakeholders, e.g., the most common constellation has been two: client and contractor. In IAM-projects, the number of stakeholders has been between three and four (client, contractor, project team, and product supplier) – some cases neglected the use of a product supplier. Thus, this master thesis extends the literature by bringing forward a multi-stakeholder perspective. Second, the IAM-projects are understudied in the relevant IS/IT projects literature – except only a few (Bruhn, Gettes and West (2003) and Everett (2011)). Thus, this master thesis, by focusing on IAM-projects, brings new empirical insights for the literature on IS/IT projects. This is especially important since IAM is key to many enterprises in a variety of industries and sectors (see e.g., Everett (2011)).

The empirical findings indicate a tight interrelation between the two research questions. By implementing an IAM-solution, organizational changes will occur, hence general challenges that have been shown in the empirical findings chapter are interrelated to some change challenges. As the empirical findings have shown, the theme Endurance indicates the challenges in the client’s energy, effort, and willingness to implement a full-scale IAM-solution. This connects with some aspects in the theme Vision, which emphasize the organizational goals and how the client must work, together, towards the vision. Mainly, in Endurance, the focus is on how to start the project – how to start the change – and ensuring that leaders have mandate – to give leaders space to make appropriate decisions in e.g. establishing a vision that can be supported by employees. By only reading the thematic code definitions, they do not tell the whole story, however, they have a connection worth mentioning. The other connection is the themes Communication, which both the one for common- and change challenges is named. They emphasize different aspects of communication, however, they both indicate challenges in how to communicate and to receive acceptability or hearing. However, the latter Communication theme emphasizes the leadership a bit more since it plays a central role inside a change process. Nevertheless, it should be noted that the other themes, Insight and Anchoring have no connection with each other – regarding the research questions perspective, thus should be treated separately in the discussion.
To emphasize the connection between the ICE challenges and ACV challenges, Figure 7 visualizes a general overview of the identified codes that have been realized by the empirical findings. As already mentioned, the ICE challenges address the first research question – common challenges, while the ACV challenges address the second research question – organizational change challenges. Additionally, the overlapping circles also create spaces that represent various interfaces between the themes. They display the narrow linkage of themes and the close connection of categories and codes. To explain the complexity of the figure, one category (Client Ambiguity) will be explained: The first code in the category is “client demand”, which refers to that the client demand is not well-defined or clearly expressed. This code is regarded as a combination of the themes Insight and Communication – the yellow marked area. The reason is that the code displays the common scenario of a client’s lack of insights into their own need for an IAM solution. This tends to influence the contractor since it becomes difficult to realize the client need if the client themselves do not possess the knowledge. Therefore, the communication between the stakeholders is often poorly defined, or they do not understand each other on a suitable level. The second code in the category is “not an IT-project”, which refers to that IAM-projects should not be treated or considered as IT-projects. This code is placed in the same yellow marked area as the previous code since client’s lack insights of why IAM-projects are not IT-projects. In addition, communication to other business entities becomes influenced by this lack of insights, hence business entities will (incorrectly) realize the IAM implementation as an IT-project. Although many contractors already possess this kind of knowledge – both that IAM-project is not IT-projects and that this knowledge is commonly absent in client companies, it takes time for the client company to realize the differences of the two project constellations. Lastly, the final code “client need from IT or Business”, which is highly connected to the previously mentioned code. Although its narrow linkage with the code “not an IT-project”, it is placed in the theme Insight without any further connection to other themes. It could be argued to have connections to both the Communication and Endurance theme. The reason for not including either theme this is that the client lacks the insight of what department initiated or realized the need for an IAM solution. Although the findings have clearly emphasized a difference in the outcome of the IAM implementation, this is not realized from the client perspective. Therefore, it can be argued to solely be placed in the theme Insight, with no other connections.

As the above example try to address and clarify, all codes have been analyzed in the same way, which has led to the visualization of Figure 7. Some codes could perhaps feel misplaced – that it could be connected to other themes, however, it all depends on the stakeholder and perspective. It should be noted that most of these challenges are mainly from the client perspective, secondly from the project team and lastly the contractor, which might be one reason why the figure is hard to grasp and feels a bit complex. In addition to the mentioned note, the white marked area in both the ICE challenges and ACV challenges is a void – none identified area. The reason for this is that no analysis has displayed a single component (code) to act as the core of all challenges, hence, there is no clear, simple, and definite answer of how to best facilitate an IAM implementation, at least up to this moment.
6.2 Common Challenges

The theme Insight, together with Communication, is arguably the strongest and most supported themes in this master thesis. The empirical data has displayed several challenges, where the client need and requirements are some of many. This finding is in line with prior research in IS/IT and outsourcing projects, where the definition of client need, demand, requirement, and success definition is vital for the project team (Chou and Chou, 2009), as well as the understanding of it (Kirsch et al., 2002) for a project’s success. The client lack of understanding is an immense challenge for both the contractor and the project team. If the client has no higher understanding of why an IAM solution is needed, except perhaps the benefits to comply with new regulations, the planning becomes difficult, and the project execution and implementation tend to be quite long-spun. Additionally, if the client – during the development phase, realize their specific need, hence want to adjust the original plan, the project team will be affected, as well as time planning and budget. The poorly execution and following project planning and budget is a well-known phenomenon in the area of IS/IT projects (Hartman and Ashrafi, 2002; Charette, 2005), which is in line with this study’s findings. However, the frequent failure of IT-projects (see Hartman and Ashrafi (2002)) does not seem to be the case for IAM-projects since according to the findings, IAM-projects do not fail that frequently, potentially not that much at all. The main reason for this is because the client need would still not be satisfied if the project is canceled, hence, the client tends to give more space for time and resources (this varies) with anticipations of an IAM launch. This connects to Johnston (1995) and Whitten (1995), where the main reason for failure is not technical aspects. Although IAM-projects do not fail, concerns of possible failures should mainly occur because of management challenges – not technical ones. However, a few interviewees questioned the definition of failure, because it can be a failure depending on stakeholder and perspective. This problem has been emphasized by several researchers (Hartman and Ashrafi, 2002; Dvir, Raz and Shenhar, 2003; Alami, 2016), where there is no clear consensus in project success and failure unless this is clearly defined for each actor before the project initiates.
Addressing the potentiality of IAM-project failure, delimitations of the IAM solution tend to be a useful and effective method. This is mainly used to ensure that the project does not escalate in an inappropriate trajectory, because of the frequently appearing unknown pop-up problems that emerge during the IAM-project. This hidden nature of project costs, or pop-ups, is no different from IS/IT projects (Fitzgerald, 1998). By creating a so-called version 1, as the first launch, the project team focus on core functionalities and features, however, this does not always meet the client’s expectations. Although the client initially lacks the understanding of their requirements and needs – it gets developed over the project’s duration – their expectations will increase, hence anticipate a certain level on the IAM solution. Challenges with client or stakeholders expectations are in line with a study by Gartner, where they express the risks that different opinions or unrealistic expectations could interfere with the ability to meet stakeholders needs (Kampman and Iverson, 2018). Therefore, IAM delimitations have both “pros and cons”. The advantage with a version 1 is that the client will, hopefully, have an IAM-system up and running that adequately meet the core functionalities of an IAM-system. Additionally, the project plan and budget are roughly met, hence there will be no total failure (although, from the client perspective, this could be considered as a failure). The negative outcomes could be that the client does not use the system because it did not meet the anticipations. Instead, they continue to use the old and obsolete system (as expressed by one interviewee). This could create relationship issues (Gonzalez, Gasco and Llopis, 2006), hence questions about a version 2 initiation from the same contractor are highly unlikely. This connects to other researchers (Lee, Miranda and Kim, 2004; Chou and Chou, 2009) where the relationship is vital to keep for future contracts or long-term relationships, which could create additional benefits.

As Lee, Miranda and Kim (2004) express the importance of relationships, the additional benefits of it could be the development of trust and voluntary sharing of resources, where time is a prerequisite – trust is not always quickly established. Although time is critical and long-term relationships entail additional benefits, most clients do not seek such a relationship. Instead, they seek a quick and fast solution that solves their current problems, which might not solve an emerging problem in the long run. However, depending on several aspects (client’s: master data, IT-maturity, preparation work, etc.), there is usually no fast and easy solution. In the client’s perspective, the best way would be to develop their current IS/IT system into something more efficient – not create a whole new system (Fitzgerald, 1998). This is in line with IAM implementations, where most clients would see it as a benefit if their current IAM solution (if they have one) is further developed. Adding to this problem, resources, either human or monetary is essential for a successful IAM-project. As with IS/IT projects or any other project constellation, the monetary budgeting is vital but sometimes difficult to get (Hartman and Ashrafi, 2002; Charette, 2005), however, the resource allocation of human capital has been an immense challenge for IAM-projects.

In addition to the IAM delimitation challenge, mainly when version 1 has been implemented, new technologies, standards, and regulations might have emerged to the market – because of the rapid technology development. Fitzgerald (1998) express the common scenario of outdated systems shortly after the development stage. This could influence the delimitated IAM solution and potentially create major adjustments. Even though this delimitation method is utilized in practice by many, this displays a challenge – as with most technologies that are being outdated to disruptive innovations. However, an IAM solution could be seen as a mandatory investment (Fitzgerald, 1998) since most companies with low IT-maturity have poor qualifications to react to major changes – changes that must be followed to not risk any compliance penalties, hence feels obligated to invest into. It can also be seen as an infrastructure investment (Fitzgerald, 1998) since an IAM solution – properly implemented and utilized – possess the benefits to enable future investments. An IAM
solution is the core foundation of a company’s IT architecture since most information is generated by an individual – identity, or entity, which must be managed with appropriate user permissions, processes, and guidelines. If this is well-established, the company can focus on other business objectives and strategies and hopefully add new technologies that utilize the IAM solution as the underlying base. As briefly mentioned, the client’s IT maturity, and corporate maturity (Everett, 2011), tend to drastically influence the initial phase of the project work. If it is high, several initial challenges are more easily managed (such as client need, master data, and client preparations). In addition to a high maturity level of a client, the reaction ability for future changes tends to increase. This is in line with Fitzgerald (1998), if business requirements and strategies might change, the system developments must be able to address those changes. Willcocks and Feeny (2006) express the maturity of other business entities, to be involved in IT strategies and IT functions, especially when changes occur. In those cases, the need for appropriate leadership is vital to include the right individuals to the right activities.

Another challenging aspect is when leaders or project personnel leave the project. Unfortunately, the time of replacement tends to take way too long to not affect the project plan. This is especially challenging if project leaders or someone with technical required knowledge is replaced. In those cases, it is comprehensible that it takes time until the recruited individual is up and running into the problematic. This could be connected to IS/IT outsourcing projects since the needed knowledge is not required anymore – IT functions is being handled by the outsourcing vendor (Willcocks and Feeny, 2006). However, as Willcocks and Feeny (2006) realized, a gap of competence could be the result of outsourcing IT functions, where this could be developed without management’s knowledge. As a response, career paths were established to retain vital capabilities. In comparison, the findings displayed the challenge of leaders coming and leaving the project – losing vital knowledge, however, if the client company establish some kind of incentive planning, they could be able to persuade their human resources to stay with the project until it is completed. Although the implementation of an IAM solution tests both organizational and individual strengths, the reason for their leave could be many.

Maintaining capabilities, especially leaders, have been expressed to be vital in IAM implementations. One reason is their task to address and facilitate the communication of stakeholders or entities. As the client tend to lack insights into several aspects, the findings have clearly displayed that IAM-projects are not IT-projects. IAM-projects are an internal/business project, mainly because of IAM-projects influences and affects all business entities inside the client company. An IAM solution is nothing that is plugged-in overnight, although one interviewee expressed the option of such a solution. Everett (2011) express the concerns if the client believes that an IAM implementation is a technical tool, similar to other IT-projects, hence this mindset must be addressed early in the IAM development. The mindset should also be to work together, where the so-called centralization concept applies to IAM and reflects on the inclusion to work together. Client personnel (or anyone using the IAM solution) must follow the same rules, routines, and processes since an IAM solution needs clear and valid data to operate and generate trustworthy data flows. Therefore, the traditional silo approach tends to be problematic for IAM-projects since most business entities work in their own way and solve their own problems. A few interviewees expressed this as “re-inventing the wheel”, which, of course, demands more effort and energy than it should. This challenge is in line with Willcocks and Feeny (2006), and partly by Fitzgerald (1998), although he mainly emphasized the importance of a business strategy, that all business entities must follow the same path to diminish potential conflicts. Nevertheless, IAM-projects can be considered to be an IT/IS effectiveness project since it does not only consider the efficiency dimension – to reduce costs of performing existing tasks, but seeks to improve organizational effectiveness.
The complexity of IAM implementations can be argued to be many, where this study has emphasized the frequently emerged challenge of a client’s lack of insight or understanding. This challenge alone can be one of the main reasons why IAM implementations tend to be complex. A method that tries to facilitate this challenge is if the contractor conducts a so-called “pilot study”, which tries to realize the client situation – find their gap, as well as to realize their need. Another method is requirement analysis, which could be conducted together with the pilot study. However, the requirement analysis mainly considers the client’s requirement and need. The pilot study is a suitable and appreciated method, it is almost a prerequisite in all client and contractor constellations. Although interviewees have expressed the benefits, they do not solve the challenge to realize the client needs on their own. These methods have not received any deeper analysis of its performance, to realize if they could have been conducted differently to realize the client need. However, despite the lack of a proper analysis of the methods, it might not be the conducting of the pilot study or requirement analysis that are the weakest link in the chain – that the contractor does a poor analysis of the client, rather the client’s lack of understanding in the problematic area (Everett, 2011). Fitzgerald (1998) express the importance of conducting a pilot study – to realize project objectives, as well to carefully make a decision for initiation (Chou and Chou, 2009). Therefore, the literature and findings agree that any type of pilot study is recommended to facilitate some aspects.

The pilot study could partly realize the client need, if so and the IAM-project initiates all stakeholders should constantly work to identify clear client requirements. Fitzgerald (1998) expressed the potential benefits of prototyping, to understand user requirements, which the findings cannot either agree or disagree with. The findings did not emphasize the use of prototyping, instead, the contractor pitched an idea of a solution where, commonly, the SSO functionality was displayed as an enhancement for the user experience. Although this displayed one dimension that would improve compared to their current system or situation, Fitzgerald (1998) expressed the importance that end-users realize the benefits of the new system – not only the visual benefits. Although the selling of an IAM solution is difficult – hard to visualize all business benefits it entails, the contractor’s pitch or selling approach could potentially be in the shoes of a salesman – the only way to certainly get a signed contract. This entails problems since the focus is to get a signed contract and not to understand the client’s, usually weak, attempt of realizing its own need (Everett, 2011). Although it is most common that the client’s need and requirement poorly defined, a few researchers have expressed the paramount to involve affected stakeholders, and especially the end-user (Hartman and Ashrafi, 2002; Dvir, Raz and Shenhar, 2003), where commitment, when changes occur, is vital (Dvir, Raz and Shenhar, 2003; Lines, 2004). This way, it could facilitate the realization of the client need since that knowledge could already be possessed in-house. In addition to the challenge of client insights, the findings display a difference in the origin of the client need – who was the initiator. If the need originated from a company’s IT department, the
project tended to be less anchored and supported by other business entities compared to if it originated from the core business itself. Additionally, if it originated from the IT department, they either did not want to include other business entities since they felt it was their task to solve, or they aimed to fix an administrative tool and not business problems (Everett, 2011). However, if it was originated from the business itself, the client already had a suitable mindset of potential changes and that all business entities must be involved in the process. This does not connect with Fitzgerald (1998), where he expressed the irrespective of the origin as long as the project is aligned with the business strategy. This is, of course, the same with the findings – the strategy alignment is essential, however, there is a difference from who it was initiated from. If the need origins from the client’s IT department, there is a higher risk that the project does not fully align with business strategies compare to if it was originated from the business’ top management.

Although there is a difference from who initiated the project, the challenge with master data has closer connections with company maturity – IT and corporate maturity. Master data is considered a challenge at the beginning of the project since the new IAM solution could benefit from a reliable data pool. If the data has poor quality or is missing attributes, the contractor or project team face early barriers to solve. One common reason for the poor data quality is the loss of control of the inflow or input of data (Kunz et al., 2019). This could be created from the HR department (manually) or from some application (Kunz et al., 2015), which affects the active directory that usually contains a lot of master data. In most cases, a so-called “cleaning job” or data cleansing of attribute errors is necessary before the IAM development can initiate. Kunz et al. (2019) describe one way to manage this challenge through their developed Total Attribute Quality Management model. However, the technical details of a data cleansing are outside of this master thesis scope, hence only general aspects of the challenge are described. Nevertheless, the loss of data controls agrees with Chou and Chou (2009), where the risk of losing control, in the form of e.g. data, is a frequent challenge. In addition, clients tend to neglect their control if they lack understanding (Chou and Chou, 2009) or appropriate knowledge (Kirsch et al., 2002), which is quite self-evident since the client seeks knowledge from a contractor or outsourcing company. Everett (2011) described that business engagement and control is usually lacking when assigning access rights to users/employees, which tends to display a low maturity level within the client company. Additionally, the control aspect possesses some further challenges. This dilemma can be elaborated to the extent if the client loses the ownership of data or information, which is a typical scenario when outsourcing IT functions. However, in the concept of IAM solutions, ownership of data should always be placed at the stakeholder who will utilize the IAM solution, which is usually the client. Although some concerns have realized the challenge if the owner of data is in the authority of e.g. the project team. In those cases, it is vital that the project team has client (internal) personnel within the team.

In addition to the project constellation and the importance to involve some responsible individual from the client side, any kind of client business management leader is well appreciated and advantageous in IAM-projects. This is in line with IS/IT projects (Fitzgerald, 1998) since it gives opportunities for the project leader to address the problem of ownership of information, and other concerns as well. Willocks and Feeny (2006) express the challenges when IT managers get excluded from business discussions and decision-making. IT managers tend to be most knowledgeable in the technical aspects – e.g. system integration, system development, etc., hence their perspective could add value to the development of the new IAM system. However, if they will not be included in the project work, they should together with top management determine another individual that could aid the project work from the client’s perspective – the importance is to have a communication channel that can flow valuable insights from different stakeholders’
perspective. Another dimension to the challenge of master data is system integration. If the master data is well-established and reliable, the systems should be fully functional and generate reliable data flows. Although this tends to be more technical, it is still a challenge for the client to understand and realize why their current systems are communicating in a certain way and how those systems will be affected by the new IAM solution. Everett (2011) express the challenge of system integration which legacy systems tend to create. This knowledge of system integration tends to be of high value for the contractor and project team if it is understood by the client, otherwise, they must place time and resources to understand why things operate as it does – usually the case. However, to make further conclusions in the integration challenge of IAM implementations, a deeper investigation is necessary to realize the importance of data flow and how it influences the communication of systems.

The aspect of integration is two-faceted. The first is the more technical system integration that considers how systems communicate. The other is organizational integration that emphasizes on the human individual and its capability to communicate with others. In fact, communication challenges are quite often underestimated. With well-established communication channels over all business entities, with no hierarchical monopoly or other obstacles to disrupt the opportunity to give internal feedback, several challenges in the IS/IT area (Hartman and Ashrafi, 2002; Charette, 2005) and IAM could be facilitated. Fitzgerald (1998) expressed concerns when communication is lacking. One example he realized was if the business strategy is to cut labor costs, but some business department further down the business chain was employing staff. In IAM implementations, communication is essential. It connects to aspects of (1) leadership getting mandate, (2) how and where should the project work start, (3) communicate acceptability of the work, and (4) why is the work even needed. Other dimensions exist as well, which entail the multidimensional challenges of communication.

In another communication dimension, one challenge with IAM-projects – perhaps a bit unique, is the challenge to agree on things and matters – e.g. the naming of positions. Most clients have business entities that work in silos – isolated from each other, hence they have their own way of working (Willcocks and Feeny, 2006). When an IAM-solution is implemented, departments must work with standardized methods, routines, processes, and use the same pre-defined namings, where these business processes, rarely, is defined in a systematic way (Everett, 2011). The namings could sound a bit off the topic and ridiculous, however, it is one of the most frequent and challenging aspects in the communication dimension, which must be set before an IAM-solution can be launched. One typical example is the use of titles since each department could have a unique definition of an employee’s title. Therefore, since each department could potentially have its own twist, with its own purpose, it is highly likely to create internal debates, which consume both time and energy. However, in the end – if this is not settled, any manager in charge must make a final decision of how things should be named to continue the progress of an IAM-solution.

Although communication could entail challenges within the client company, adding external stakeholders to the constellation create bigger barriers to handle. In IS/IT outsourcing, the contractor is responsible for software development and maintenance, hence could be influenced by other stakeholders in a negative way (Gonzalez, Gasco and Llopis, 2006; Chou and Chou, 2009). However, the aspect to give and take feedback to the development team is essential for a suitable creation of the system. Although, these feedbacks might affect the time aspect if new demands appear. Willcocks and Feeny (2006) express the mitigating factors if core IS capability success levels are established, where one was the responsiveness to new demands. However, in the case of IAM-projects, considering and accepting new demands is a “non-acceptable” action to ensure a project’s
success (the magnitude of the demand will, of course, decide its potential inclusion). This is because of the common overruns in costs and time of IAM-projects. In addition to the external influences, the handover phase tends to be challenging. Munns and Bjeirimi (1996) state the importance to extend the handover process to the utilization phase, where the project team can enrich the client with its knowledge about the system. This connects with the findings in several aspects. First, the handover phase must be communicated in the initiation of the project, who will use it and who will have responsibilities of certain matters in the system. If this is not achieved, the handover can be performed too quickly, which result in client personnel lacks the knowledge to utilize the system. This tends to be an unpleasant experience for those with responsibilities – within the client – to uphold the system’s activities since they do not have adequate capabilities to maintain the system. In addition, this could result in the possibility that the client decides to not utilize the new IAM solution – they continue to use their old and obsolete system. The other aspect regarding the handover phase is the concerns of system administration. The concept of system administration/management is something the client is taking for granted since in most cases they do not have the needed competence to solve problems or issues in the system – unless a solid handover has been performed. In IS/IT outsourcing, the scenario is different since the contract, usually, clearly describe that the contractor should develop and maintain the system over a certain time (Gonzalez, Gasco and Llopis, 2006; Chou and Chou, 2009). However, in the case of IAM implementations, there is a single product that is delivered to the client, which should be the client’s responsibility to manage for future development and maintenance – unless something else is agreed in the contract, although that is rarely the case. If the contractor neglect the administration/management component, it will most likely negatively affect the relationship (Lee, Miranda and Kim, 2004), hence a potential future contract is most unlikely.

The last aspect of external influences is the challenge of withholding information to the client. This challenge, created by the contractor, could be one of the reasons why it is so common that clients lack a suitable understanding of their need and what kind of business journey this implementation will induce. If the contractor realizes the complexity of a client’s need and how much work an implementation will entail (for all stakeholders), but still does not brief the client – intentionally, it is evident that there will be consequences in the long run. These consequences could be in the form of e.g. the increase of client expectations, new demands (when the client has realized their need and the potential of IAM) and why client business entities and the IT department think it is an IT-project. In addition, prior research has displayed the disadvantage when the client lacks understanding (Chou and Chou, 2009) or knowledge (Kirsch et al., 2002), hence this challenge could possess second order effects (Fitzgerald, 1998) – adjust a consequence could result into other consequences. Nevertheless, if the external parties would share their knowledge and sell the truth, not parts of it, fewer contracts and projects would most likely be initiated. If the client realizes the consequences of an IAM implementation – any of the challenges emphasized by the ICE or ACV challenges, their initial time planning and budget must be adjusted if an implementation should be feasible. Therefore, this challenge is comprehensible – contractors seek a signed contract, although it might be one of the main reasons for the client’s lack of insights.

6.3 Change Challenges
The IAM implementation entails organizational changes. When changes occur, it is vital to have dedicated support and anchoring from both employees and top management. The anchoring aspect is mainly about how to display everyone’s involvement and where they “fit” in the process of change – how can they contribute, and if they understand the purpose and benefits of the change (Fitzgerald, 1998; Everett, 2011). In most cases, resistance emerges as a human response since the
traditional and common way of working is being questioned, hence the risks of influenced job satisfaction might emerge (Fitzgerald, 1998). However, if employees and stakeholders have well-established communication the severity of resistance may reduce (Chou and Chou, 2009). Despite suitable communication methods, Kirsch et al. (2002) expressed that the information itself is not enough, individuals or clients must understand the information in order to act on it, which describes the complexity of communication.

Although communication serves its role, someone must be willing and have the knowledge to distribute it. The naming of a Champion is recognized in organizational changes, where some companies do not consider a project implementation without a Champion (Fitzgerald, 1998). The findings have emphasized the importance of a Champion or communicator, however, it is not utilized in a necessary extent to facilitate and enhance IAM implementations. In connection to a communicator, if no one has exclusively been determined to act as a communicator the project manager tries to mediate the most vital points. The project manager must understand the business environment, the success factors of the project and the associated risks to make appropriate decisions (Chou and Chou, 2009). In addition, they must also understand the nature of the organization and its culture (Bourne and Walker, 2005). It is further important that they are engaged with IT issues (Willecocks and Feeny, 2006), which could entail difficulties. In an ideal case of an IAM-project, the project constellation has two project managers, one technical – addressing technical concerns, and one management – addressing the individuals inside the group and encourage their working progress towards the objectives. This way, decision-making is better judged with both IT functions and business strategies. Although the challenge of weak leadership in the form of abdicated control (Kirsch et al., 2002), participation (Kirsch et al., 2002), and poor decision-making determined from managerial intuitions (Fitzgerald, 1998), are in line with the findings. As Kirsch et al. (2002) emphasize the abdicated control, it can be based on different scenarios. One is the aspect of outsourcing projects, where the client usually abdicates its control of IT functions. However, the other scenario relates to managerial participation, when a leader/manager does not want to be involved in the project. This could be because of lack of time (Fitzgerald, 1998; Kirsch et al., 2002) because they do not believe in this project – no commitment (Kirsch et al., 2002), or that they do not want to lead, hence neglect its importance to the client firm. This is, of course, an immense challenge for IAM-projects, where suitable leaders are a prerequisite for project success. In addition, the project manager should emphasize the inclusion of other executives since this project influence everyone inside the client company.

The project manager serves many purposes, where one is to decide the starting phase of the project. In almost all project constellations, it is a prerequisite that project managers have mandate – to be able to lead and make vital decision-making. Kirsch et al. (2002) express that clients, rarely, have formal positions of authority over IS project leaders, which describe both advantages and disadvantages. If the client has the highest authority over the project, new demands and other adjustments would increase the risk of project failure (budget and time overruns). On the contrary, if the IS project leader has the highest authority, the project will, probably, have a higher likelihood to succeed. Therefore, communication between stakeholders is vital, although the mandate and authority should be placed at the project leader. Furthermore, if the authority is at the project manager, he/she must emphasize to start with something small and easy – not multidimensional, to give the team a soft start of the otherwise challenging project. Fitzgerald (1998) expressed the issues by implementing a “big-bang” approach – embrace the project as a single milestone. This challenge is in line with the findings, where the starting phase cannot be placed with something big and complex. The phrase “aim for the starts but start with something simple” was stated by many interviewees. However, one interviewee expressed the concern if the project team takes too long
time to analyze what to start with, hence they should start with anything to get things going. The issue with this method is the risk of rework and the risk by starting with the most complex sub-goal. Therefore, some kind of assessment should be performed (Chou and Chou, 2009). The business strategy must be divided into sub-goals, where each sub-goal is connected to some business benefit. This way, the client will realize what kind of benefit they will receive when a sub-goal is achieved (Fitzgerald, 1998; Hartman and Ashrafi, 2002). By connecting sub-goals to business benefits, it facilitates many aspects such as (1) the communication of the project’s importance to higher superiors and client personnel, (2) easier to get more resources if executives realize the benefits it will create, (3) easier for the personnel to understand the magnitude and benefits of the project, and (4) the project team will receive positive feedback or hearing from others. The latter one encourages the project team to continue on this “bumpy” road to success, however, this encouragement should be more emphasized. In addition, these aspects of receiving business value are in line by Gartner (Kampman and Iverson, 2018), where they express the lack of clarity in the business value the IAM solution should entail.

By visualizing the business benefits that will entail as an effect of a fulfilled project milestone, it facilitates the progress of receiving support or anchoring. Many IS/IT-projects challenges would be difficult to address if there were no support or anchoring to the project team (Fitzgerald, 1998), which is the same for IAM-projects. Anchoring through the entire client company must be established before the project initiates, at least some support from top executives from different business department is vital to make this process feasible. If business anchoring is achieved, it tends to facilitate the realization of client personnel’s place in the change and how their role will be after the change. In addition, if client personnel realize that their feedback and inclusion influence the final outcome (Kirsch et al., 2002), their involvement could reinforce the business anchoring. Fitzgerald (1998) emphasize the keen aspect where those most affected by the change should get the opportunity to influence events. This connects to the findings, where feedback sessions or some communication channel for continues feedback to the development of the IAM-system should display possible second order effects. If end-users are not included, a vital source of crucial information is cut off, which would increase the risks of an end product not meeting end-users requirements (Willcocks, 1994). In addition to anchoring, the concept of agreement is crucial. If a consensus is established, the project tends to be more supported, hence the planning or business strategy will be easier to hold (Lee, Miranda and Kim, 2004).

Receiving agreement or consensus from employees and top management is one aspect to the anchoring dimension. One vital point to the agreement is the alignment to the business strategy. The business strategy places a vital role to ensure that personnel realizes both the process of the project and what the final outcome will – most likely – be. Additionally, it is vital that the IT infrastructure is closely aligned with the business strategy, to diminish the potential loss of capabilities (Willcocks and Feeny, 2006). The strategy displays objectives and activities in how to reach the goal, also known as a vision. The vision should be, in an ideal scenario, created inside the client company together with employees and top management. However, the findings expressed that the Top-Down approach is not necessarily a bad method – Gartner finds it necessary (Kampman and Iverson, 2018). Although the consensus approach – the vision is created together inside the client company, could create second order effects such as (1) employees feeling included, (2) they realize the benefits of the process of change, and (3) other positive effects of being involved in the organizational change. This is partly in line with Fitzgerald (1998), where a consensus should increase project success because if they are separated, responsibilities and objectives could become diluted or lost. The consensus phenomenon requires suitable communication, as well as the vision. The vision should be communicated through the entire client company and always be accessible...
for employees and executives. The business strategy should display an educating plan of the new system (Fitzgerald, 1998), where the vision should display the benefits compare to the old way of working. The vision could also display the potential flexibility for future alteration, however, as Willcocks and Feeny (2006) expressed it, the strategic role is key to ensure a suitable vision, learning capabilities, and flexibility to future changes. Therefore, the strategy and vision are highly connected and should be address before the IAM-project begins.

Although a suitable strategy and vision are established, there is still no guarantee of fewer challenges as corporate culture and resistance. As already mentioned, IAM implementations will entail organizational changes, hence resistance is a common phenomenon (Fitzgerald, 1998; Chou and Chou, 2009). The most appropriate way to manage resistance, which has partly been discussed is through (1) communication – how they can contribute to the change and give feedback, (2) inclusion – were they fit into this process, (3) realization – how they realize the benefits of the change, (4) education – how they will be educated to use the new system, and (5) consensus – everyone involved must agree on the change and its execution. This partly connects with McElroy (1996) to manage strategic change, where he emphasizes the awareness of individuals possible reactions to change and their need for guidance to support them through difficulties they experience. This is in line with the findings – individuals that create legacy systems, where employees act resistant to change in the form of inclusion and realization – either they do not want to be included or realize the benefits of the new system or the communication through the company is poorly performed.

One aspect that almost always comes hand in hand with resistance is the corporate culture. Culture tends to challenge and question new ideas, hence resistance occur quite frequently. The culture could be connected to the silo approach – business entities isolated activities, where an IAM implementation will force them to work more together and integrated. Common resistance to this is the cooperation between the IT and HR departments since they have never had a reason or need to work with each other before. Although it is difficult to realize their connection, Young (2004) expresses the importance to get HR buy-in from the start of the IAM-project to increase the success of an implementation. If the client’s HR system is more than adequate and has reliable master data, the IAM solution and the HR solution should be closely aligned with each other. In some cases, an HR system could already possess vital components that an IAM-solution usually address, hence the IAM development should consider this before entering the development phase. Another benefit of getting HR buy-in is the competence and understanding HR possess in setting adequate roles for new personnel (which IT-personnel does not always have). In addition, Willcocks and Feeny (2006) expressed the project needs a mix of skills, not only technical abilities. This connects to the findings and could possibly be considered to IAM-project in general – a mix of competence is needed to accomplish a successful IAM implementation.
7. Conclusion

This chapter presents the conclusion of the thesis and connects back to the introduction chapter. Section 7.1 presents a brief summary of the thesis. Section 7.3 presents the implications, both literature and industrial, where the strongest findings are mainly emphasized. Section 7.5 presents ideas for further research.

7.1 Summary

In this master thesis, the research questions of “Why do challenges emerge when an Identity and Access Management solution is implemented?” and “What challenges arise in the change process that an Identity and Access Management implementation create inside a client company?” have been addressed. To fully do so, a case study (Yin, 2003) was conducted in Sweden. In addition, the case was combined with qualitative data in the form of semi-structured interviews, and secondary data such as reports and papers in the area of IS/IT-projects and outsourcing projects. Analytical reports from a non-academic organization were also conducted – as secondary data – since their in-depth knowledge of IAM implementations enabled a narrower discussion with the empirical findings.

The empirical findings of IAM implementations challenges realized the ICE challenges – common challenges in IAM implementations, and ACV challenges – organizational change challenges in IAM implementations. They appeared to be obstacles which highly influence the progress and outcome of an IAM accomplishment. These findings could act as preparations for upcoming IAM implementations, where any stakeholder (client, contractor or project team) could use these insights to facilitate their progress – although the client perspective is slightly emphasized over the others. The comparison with prior research in IS/IT-projects, e.g., Fitzgerald (1998) and Hartman and Ashrafi (2002) had several aspects that were in line with the findings, however, some findings realized new insights into the researchable phenomenon.

7.2 Implications

7.2.1 Implications for literature

The connection between IS/IT projects and IS/IT outsourcing projects and IAM-projects are closely aligned. Although this research could be argued to be the first academical of its kind, more research in the IAM-project constellation is needed to validate the empirical findings. The importance of the client’s need and requirement of a new system is one of many vital challenges that has appeared in both IS/IT-projects and IAM-projects. The lack of suitable communication between stakeholders and business entities has also been highlighted as an immense challenge – communication is everything in project work and especially in IAM-projects. In addition, project overruns in time planning and budget are challenges in both areas, as well as the influence of weak leadership and lack of human resources and capabilities to make the implementation feasible. Although many dimensions connect with each other, new insights in the IAM constellation is realized. Therefore, new and in line insights contribute to research in IS/IT-projects and IAM-projects.

One, perhaps confusing, finding is the statement that IAM-projects are not like IS/IT-projects. Although they have much in common, where both project constellation results in a technical solution, the empirical findings still expressed their differences. Another difference from the compared areas is the origin of the client need. The findings emphasized the benefits if the client need is realized in a business level – not from the IT department, however, prior literature expressed the irrespective of the origin if the project is aligned with the business strategy.
7.2.2 Industrial implications

The findings in this thesis display, mainly, the challenges for the client company when implementing an IAM solution, although other stakeholders’ perspective is also emphasized. This work should contribute to industrial companies seeking to realize common barriers and pitfalls, and how to potentially overcome them in the progress of an IAM accomplishment. This way, stakeholders should create awareness of potential challenges that tend to emerge and educate personnel with suitable techniques and methods to better manage unexpected challenges in IAM implementations.

The most frequent and severe challenge highlighted by the empirical findings was the client’s lack of insights and to understand their definite need for a new solution. This challenge alone causes multiple consequences – like a chain of new challenges. If this challenge would be properly addressed, future IAM implementations should be enhanced in a great magnitude. However, since this challenge is not one-dimensional, it is difficult to fully mitigate. The lack of client insights has created other challenges as a cause of it. These challenges are identified as master data, cleaning job /data cleansing, and the client’s IT and corporate maturity. Although these challenges are demanding, they serve as a small scale compare to the lack of client insights.

One, perhaps, vital implication – more targeting managerial implications, would be the external influences. The consultancy and outsourcing line of business are quite closely related in this context, hence display similar challenges. The findings emphasized the fragile handover process, where either the contractor handed the solution way too quickly to the client, or the client did not see their place in this process – e.g. did not dedicate time to learn the system or set responsibilities to internal individuals. The findings also emphasized the negative outcome when contractors, intentionally, withheld essential information from the client – mainly to increase the likelihood of signing a contract. This conscious decision influence several aspects in the project work, hence other challenges could arise compare to if the contractor would share important information with the client. In addition, this challenge argues that the contractor pitched the idea of a solution in the shoes of a salesman, hence lost their focal point to fully understand the client need.

In addition, the contractor, when realizing that the strategy or project plan will not hold, could decide to delimit the IAM-solution. This practical method results in high risks that possibly do not meet client expectations, hence could negatively influence the handover process where future relationship is highly unlikely. Therefore, to increase the probability of a successful project from all stakeholder’s perspective, honest communication is essential to establish. Additionally, to increase the likelihood of project success, a vision must be set and communicated through the entire client company. The vision and the reason for an IAM implementation must be anchored in the client company, otherwise, resistance and corporate culture might be too oppressive barriers to make this implementation doable.

7.3 Further research

There exist several interesting dimensions to continue research in the IAM sphere. However, since most of the interviewees in this thesis have acted as a contractor, it would be interesting to see if a similar case study, but with respondents that have acted as a client would generate similar findings. Another interesting area would be to mainly target the external influences – trying to isolate it – and see the definite influence it has on the outcome of the implementation. Nevertheless, the multidimensional challenges – ICE and ACV – have been a task itself to break down, hence a narrower scope in each challenge could be interesting to research into. For example, the Endurance theme tests a client’s strength, which most changes do, hence it would be interesting to isolate it
and compare different cases of IAM, or IS/IT, implementations and how they overcome this complex quest.

Lastly, I want to emphasize Figure 7 (in chapter 6.1) and its attempt to visualize the connection between the themes realized in the findings. Although no definite code or category was found as the focal point of all challenges – the central white area in the figure, it still displays vital challenges that interrelate with each other. Therefore, future research into the non-technical phenomenon of IAM implementations would be interesting to see if there exist a single component that appears and influence all dimensions of challenges.
8. List of References


