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# Creating User Provision Proposition for SAP IBP Cloud Tool

Metropolia University of Applied Sciences

Bachelor of Engineering

Industrial engineering and management

Bachelor's Thesis

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<p>This study examined how a user provision process should be planned and executed to be as efficient as possible. The objective of this study was to create a proposal for user provision process for the case company to implement alongside the SAP IBP cloud tool.</p> <p>This study was conducted as qualitative research. The data used in this study was gathered in three phases. Data 1 was collected by observing the process and interviewing employees during the current state analysis (CSA) in order to identify development areas regarding the current process. Based on the identified weaknesses related theories were studied to create a conceptual framework (CF) for the study. The first proposal of the process was created based on Data 2 collected by interviewing employees and the CF. In Data 3 stage, the initial proposal was evaluated and further developed to create the final proposal. The final proposal was presented with recommendations of the next steps towards implementation.</p> <p>The outcome of this study is the proposal for the user provision process for the case company presented as a flow chart. The proposal also gives insights on how to maintain the process and further develop it. The outcome is in line with the case company's strategic goals.</p>	
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<p>Tässä tutkimuksessa tutkittiin, kuinka käyttäjien palveluprosessi tulisi suunnitella ja toteuttaa mahdollisimman tehokkaaksi. Tämän tutkimuksen tavoitteena oli luoda käyttäjien palveluprosessia koskeva ehdotus asiayritykselle toteutettavaksi SAP IBP -pilvityökalun rinnalla.</p> <p>Tämä tutkimus tehtiin laadullisena tutkimuksena. Tässä tutkimuksessa käytetyt tiedot kerättiin kolmessa vaiheessa. Data 1 kerättiin haastatteleamalla työntekijöitä sekä tarkkailemalla prosessia nykytilan analyysin (CSA) aikana. Tämän tavoitteena oli tunnistaa nykyisen prosessin kehitysalueet. Tunnistettujen heikkouksien perusteella tutkittiin aiheeseen liittyviä teorioita tutkimukselle käsitteellisen viitekehyksen luomiseksi (CF). Yhdessä CF:n sekä kerätyn Data 2 kanssa, ensimmäinen prosessiehdotus luotiin. Data 2 kerättiin haastatteleamalla yhteistyöyrityksen työntekijöitä. Data 3 kerättiin haastatteleamalla eri sidosryhmiä ja sen tarkoitus oli alkuperäinen ehdotuksen arviointi ja kehittäminen edelleen, lopullisen ehdotuksen luomiseksi. Lopullisessa ehdotuksessa esitettiin seuraavat askeleen implementoimista varten.</p> <p>Tämän tutkimuksen tulos on ehdotus käyttäjäyritysten prosessiksi tapausyritykselle vuokaavion muodossa. Ehdotus antaa myös ohjeita prosessin ylläpitämisestä ja edelleen kehittämisestä. Lopputulos saavutti asiakasyrityksen strategiset tavoitteet.</p>	
Avainsanat	Käyttäjän hallinta, IT-palvelut, pilvityökalu, integroitu liiketoiminnan suunnittelu

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## List of Abbreviations

SAP IBP	SAP Integrated Business Planning
CSA	Current State Analysis
CF	Conceptual Framework
SD	Service Desk
AD	Active directory
IAM	Identity and access management
MAC	Mandatory access control
DAC	Discretionary access control
RBAC	Role-Based access control
ABAC	Attribute-based access control
ITSM	IT service management
ITIL	IT Information Library
SVS	Service value system
KM	Knowledge management
IAS	Identity access provider
ERP	Enterprise Resource Planning

## 1 Introduction

For every business to be as effective as possible it is important to create processes. Well-defined processes can improve productivity within and across organizations. (Axelos, 2019) The focus of this study is to create a new process chain for the case company's service request process in collaboration with the service vendor. The case company is later referred to as Company X and service vendor as Vendor Y.

### 1.1 Business Context

Company X is a global company which has over a billion turnover yearly. Company X consists of multiple business areas which each focus on different wood-based products. The main raw material used in the group's products is Nordic wood. Key values at the company are responsible performance, reliability, cooperation, and renewal. These values steer the concern's decision making towards more environmentally sustainable business and is seen as in action as the raw wood material used is 100% traceable.

To conduct business Company X uses many different software systems which all requires authorization to be used. Different systems are used to control production, purchasing, bookkeeping, HR and sales. A great portion of the business controlling is done using a third-party enterprise software SAP. For security, risk management and legitimate reasons user authorizations are required to ensure that no illegal or fraudulent use occurs with the software.

### 1.2 Business Challenge, Objective and Outcome

The company plans to implement a new cloud-based tool to replace an old on-premise system in sales and operations planning to stay ahead in the rapidly growing competitive business environment, the tool is called SAP IBP, SAP Integrated Business Planning. The solution for deploying the SAP IBP cloud tool must be designed and developed using a standardized method that strengthens and maintains authorizations in order to guarantee a stable and secure system that can be effectively managed and maintained.

Authorizations make it possible to restrict access to critical information based on a user's business responsibility. The authorizations are intended to prevent both accidental and intentional misuse of the systems.

**The objective for this study is to create user provision process proposal for the case company to implement alongside the SAP IBP cloud tool.** The outcome of this project is a proposal of a user provision process for the case company presented as a flow chart. The result of this thesis is important since there are no processes defined for the new cloud tool and they are required for efficient use and risk management reasons. This study was conducted with close collaboration with Company X and its service vendor Vendor Y.

### 1.3 Key Concepts

In the following table the key concepts of this study are presented.

IDENTITY AND ACCESS MANAGEMENT	Management of users' access to different objects for example to data
PROVISIONING PROCESS	Process of setting up IT infrastructure
SAP IBP CLOUD TOOL	SAP Integrated Business Planning, a cloud-based planning software for supply chain
SERVICE VENDOR	Vendor providing predetermined service

### 1.4 Thesis Outline

This thesis is restricted to developing a process chain to Company X which is used to manage and maintain user authorizations with the SAP IBP cloud solution. The aim of



the study is to examine current user authorization process' main values and develop an improved chain of processes in line with the company's values and requirements.

This thesis is divided in 7 sections. The first section introduces the case company's field of business, values, and the business challenge in question for the study. The second focuses on the methods used in the study. It explains how this study was conducted. Section three includes detailed analysis of the current state of the case company's authorization process. The relevant literature and conceptual framework of the study is presented in section four. Section five consists of the developed proposal for the processes and a description how this was built. Then in section six is the validation of the proposal and in the final section of the study, section seven, conclusions of the study are presented.

## 2 Method and Material

This section describes the research design, as well as the methods and data used in this study. The section starts with the research approach and is followed by research design diagram and a project data collection schedule. The section is finished by project plan and schedule of the project.

### 2.1 Research Approach

This study was conducted using qualitative research. This research approach involves collecting and analyzing non-numerical data to better understand opinions, experiences and broad concepts. Qualitative research tends to be flexible for different variations and approaches. The most common methods of this research are observations, interviews and secondary research.

In this study qualitative research was selected to evaluate the current state of the Company X's process chain by studying existing materials and conducting interviews of the stakeholders. Based on the current state analysis a development plan was created to further improve Company X's process chain. The selected approach uses methods fitting for the case project.

### 2.2 Research Design

The objective of the study was to create a development proposition of the Company X's process chain for the SAP IBP Cloud Tool. For this study the data collection was scattered to different sources to ensure the most accurate results. The research was conducted by four-step research design shown below in Figure 1.

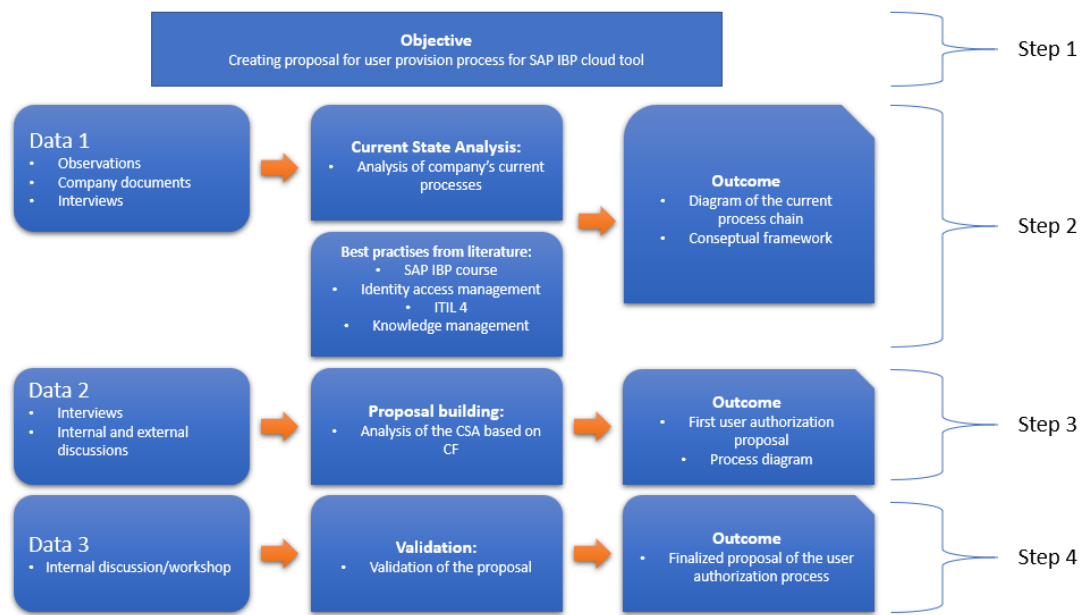


Figure 1 Research design

As Figure 1 above demonstrates the research design consists of four steps. The first step of the research design was setting the objective of the project which was to create a user authorization process for the SAP IBP cloud tool.

As the design illustrates the second step was to gather the first data which included observations of the processes, studying company documents and interviewing stakeholders. Based on the gathered data, the current state analysis was produced in the form of process diagram of the authorization process in the Company X. To recognize the strengths and weaknesses of the current process a literature study was conducted on relevant topics. Outcome of the second step was a process diagram of the current state which was used to recognize possible bottle necks and better understand the main values of the current authorization process. Based on the weaknesses revealed by the current state analysis relevant literature was chosen. This was then used to formulate the conceptual framework for the study.

The second data contained internal interviews and discussions about previously produced current state process diagram. In the third step of the design, an analysis of the diagram was conducted in collaboration with the stakeholders. Based on the interviews and relevant literature the direction of the development was set to be in line with the

company values, objectives, and best practices. The outcome of the third step the first development proposal.

On the fourth and final step the third set of data was gathered via discussions. The purpose of the data was to validate the proposal. Data contained the strengths and weaknesses of the first proposal. Based on the third data the first proposal was further developed to match the Company X's values, objectives and needs as well as possible. The development was done in close collaboration with the stakeholders.

### 2.3 Data Collection and Analysis

This study was conducted using a qualitative research approach according to which the data needed was mainly gathered by interviews. The Table 1 shows each data collection session separately, participants and descriptions of the sessions as well as date and duration of the session.

	Participants / role	Data type	Topic, description	Date, length	Documented as
	<b>Data 1, for the Current state analysis</b>				
1	Christa Coulter: Project supervisor	Microsoft Teams Meeting	Project Kick-off, discussion of the aim of the project and schedule of the project	Dec 2020, 1 hour	Field notes
2	Christa Coulter: Project supervisor	Microsoft Teams Meeting	Update Meeting, discussing next steps	Jan 2021, 1 hour	Field notes
3	Project supervisor	Microsoft Teams Meeting	Update Meeting, discussing next steps	Jan 2021, 1 hour	Field notes
4	Consultant	Microsoft Teams Meeting	Validation of Current state, strengths, and weaknesses	Feb 2021, 1 hour	Field notes
5	Consultant	Microsoft Teams Meeting	Validation of Current state, strengths, and weaknesses	Feb 2021, 1 hour	Field notes
	<b>Data 2, for the Proposal building</b>				
6	Project supervisor, Consultant, Solution designer	Microsoft Teams Meeting	Proposal building	Mar 2021, 2 hours	Field notes
7	Project supervisor, Consultant, Solution designer	Microsoft Teams Meeting	Proposal building	Mar 2021, 1 hour	Field notes
	<b>Data 3, for the Proposal finalization</b>				
	Project supervisor, Development manager, Solution designer	Microsoft Teams Meeting	Proposal presentation and validation	Apr 2021, 1 hour	Field notes

**Table 1. Details of interviews and discussions**

As Table 1 demonstrates, data for this study was collected in three separate steps. The first data collection, Data 1 was collected to construct analysis of the current state of the processes. In this study Data 1 was collected primarily by observations of the everyday processes and studying internal documentation of the company.

In the second step of data collection, Data 2 was gathered by interviewing stakeholders. The aim of the second step was to gather suggestions from stakeholders for the development proposal. This included discussions with the case company's solution designer and service vendor's employees in order to establish common goals and values.

In this study the interviews were the main source of data collection. The interviews were conducted remotely via Microsoft Teams due to the prevailing situation in the world during the study. The interviews were semi-structured with open-ended questions sent to the participants beforehand. The discussions were documented by taking notes of the interviews. In Table 2 below internal documents used in the current state analysis are listed and described.

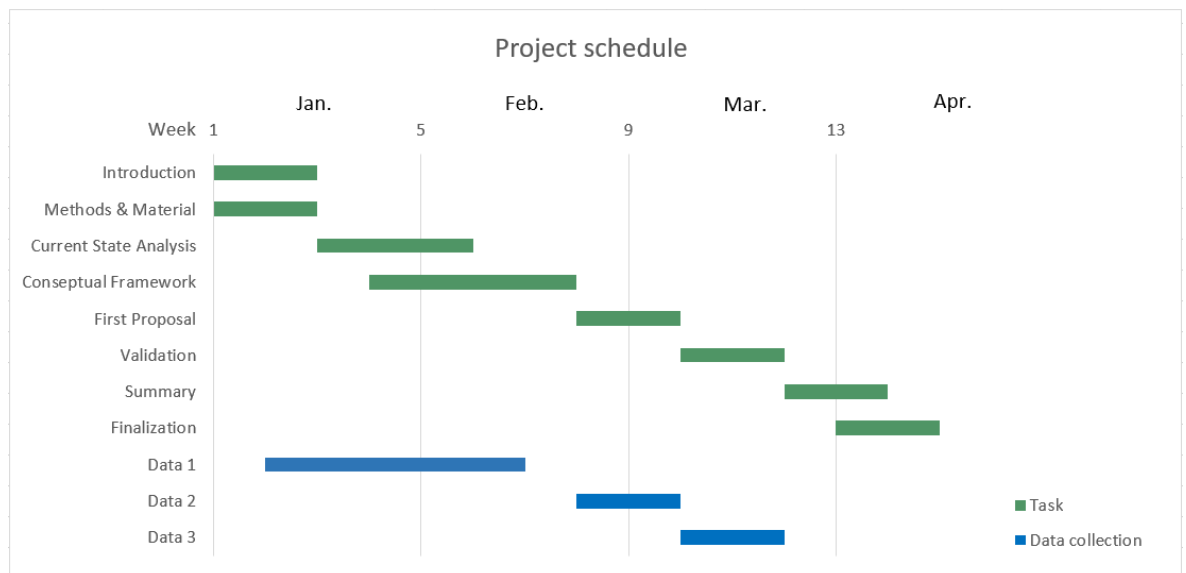
	<b>Name of the document</b>	<b>Number of pages/other content</b>	<b>Description</b>
A	Authorisation concept	x	Current authorization concepts of the case company's business areas
B	Checklist for Company X Total Care service	6	Description of current service provided by Vendor Y

**Table 2. Internal documents used in the CSA**

To conduct this study also multiple internal documents were analyzed as seen in Table 2. The main documents included the description of the current service process with Company X and Vendor Y. The documents were used as part of Data 1 to visualize the current state of the user authorization process for CSA. In addition to internal documents observations of the process were made by the researcher of this study.

## 2.4 Project Plan and Schedule

In this section the project plan and schedule are explained. In the chart below (Figure 2) is a week-by-week project schedule in the timeframe from January to April 2021. The table includes scheduled tasks and data collection periods.



**Figure 2. Project schedule**

As presented in the picture above (Figure 2) the project started in the first week of January 2021 with introductory tasks which included defining the objective as well as the scope of the project. After the structure of the project was planned and visualized the first data collection could start. The first data collection was a mix of studying the existing process and interviews with the stakeholders. Simultaneously with the first data gathering the current state analysis was started to be constructed.

After the current state analysis, the project was planned to continue with creating a conceptual framework which would be used further in the project to create a development proposal for the case company. Because of its importance for the results of the project creating the conceptual framework was scheduled to take the most time of any tasks in the project.

When finished the next scheduled task of the project was to start the second data collection period and create a development proposal for the case company based on the collected data and literature. After the interviews and collaboration with the stakeholders the first proposal was finished, and it was validated. The validation was done by collecting the third set of data. This step included discussions with the stakeholders to ensure the proposal correspond the wishes and values of the case company. Finally, after validating the proposal it was further developed, and the final proposition was created. To end the project the summary of the project was constructed and the whole project was finalized.

In order to ensure the progress of the project as well as possible and to prepare for any inconvenience the following risk analysis (Table 3) was conducted. In the table below the possible risks that may interfere with the project schedule, how likely they are to happen and how the project group plans to prepare for the possible delays are described.



<b>Risk</b>	<b>Likelihood</b>	<b>Impact (1-5) 1:low 5: high</b>	<b>How to prepare</b>
IT problems	As working remotely it's likely to have problems time to time	2	Schedule is flexible for few inconveniences.
Global situation	Unstable global situation can possibly affect work.	4	Company has established working processes during pandemic, but Key persons absence could affect schedule drastically.
Scheduling	Scheduling interviews/workshops with stakeholders could turn out to be challenging.	2	Possible delays have been taken in account in project schedule.
Scope increases	IBP does not work alone, needs connections to other systems. Possibly need to include other systems to the study.	3	Possible delays have been taken in account in project schedule.

**Table 3. Risk table**

In the following chapter the current state analysis is introduced. In the chapter the data gathered to produce the CSA and all projects' stakeholders and their relationship at current state are described.

### 3 Current State Analysis

This section discusses the current state of Company X user authorization management process in SAP systems. User authorization management in Company X has been implemented in collaboration with different service providers over time. In this chapter the current state of the relationship between the company and service providers in user management is described and an analysis of this conducted. The current state analysis was conducted to understand the main process chain in user management in order to implement it to a new cloud tool.

#### 3.1 Overview of the Current State Analysis Stage

To comprehend the current processes of Company X user management process and to create the new development proposal based on best practices, the author of the study gathered various data. In order to ensure the understanding of the current state was accurate and the results could be used in the future development proposal the data was gathered in different ways.

The first step of the CSA was to study the company's internal documents considering user management process in order to get familiar with the planned process and related stakeholders. The documents gave an overview of the planned process inside the company and people related to it.

The second step the observations of the process were made to see how the planned processes are performed in practice. During the observations, the author of this study took notes of the practices. The notes were later compared to the documented process chain to spot possible differences.

As the third step all the data gathered was analyzed and flow charts of the processes were made. The flow charts represent how the planned processes are currently done in practice and whether actors in the process follow the documented practices.

The fourth step was to conduct interviews with the stakeholders. The objective of these interviews was to ensure that the information on the created flow charts were accurate. In the interviews the employees working with the user management were interviewed

and notes were gathered based on these interviews. The flow charts were updated to be even more accurate based on the interviews.

The fifth and final step of the current state analysis of the user management process was to analyze the collected data from the observations and interviews. Based on the gathered knowledge of the Company X's operations the analysis of the main process chain was made as well as the analysis of the strengths and weaknesses of the current process.

### 3.2 Authorization Concept Currently in Company X

In this section the authorization management concept has been visualized to represent three main situations of user management. The three situations include creating a new authorized user, managing user access rights, and removing user access rights. The development and implementation of these situations is part of the objective of this study. All three situations have been separately visualized to better understand the user management in Company X and the values behind it and to ensure an accurate analysis of the strengths and weaknesses of each process.

#### 3.2.1 Authorization Process for New User

In Figure 3 depicts how the authorization process is done in Company X for a new user. The most common trigger for this process is a new employee starting to work in the company and needing system access.

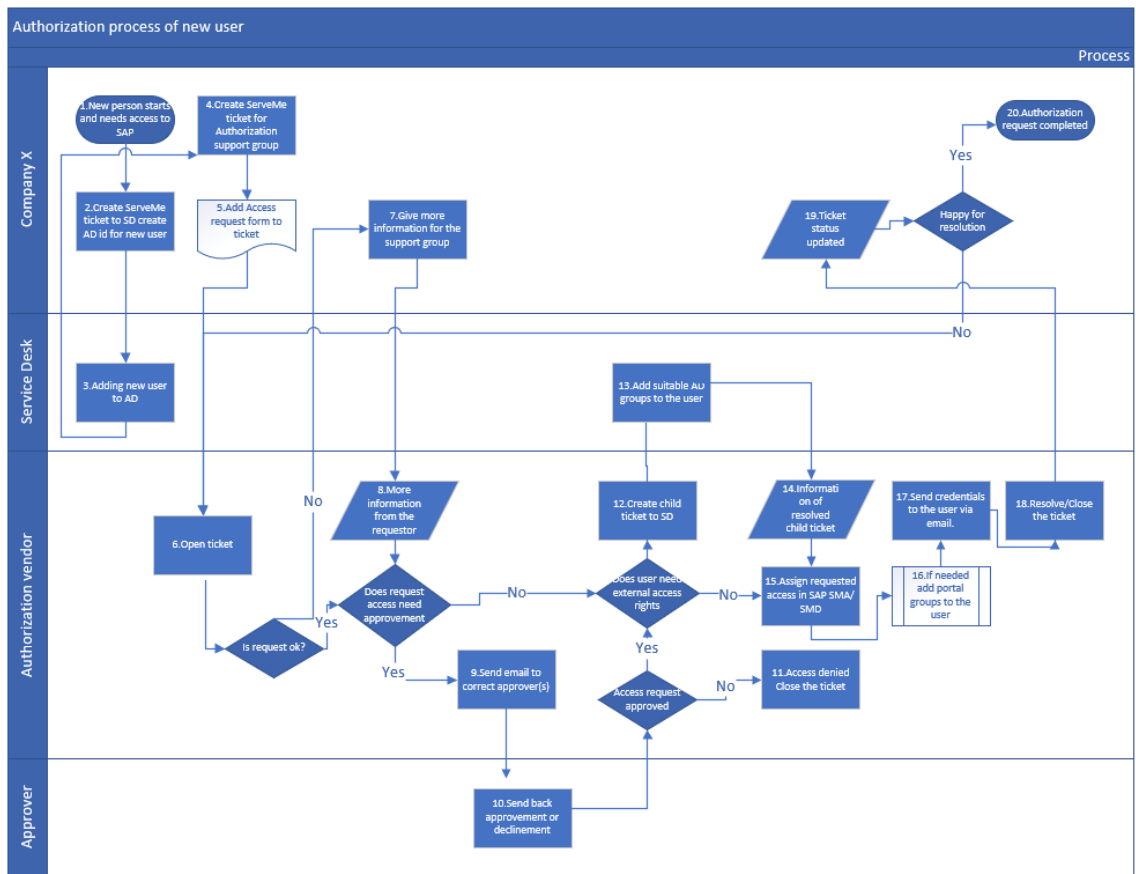


Figure 3 Authorization process of a new user

Table 4 below shows the process in detail.

Step	Automated	Details
Start		
1. New person starts and needs access to SAP	No	Business notices that new person need access to the SAP system and starts process.
2. Create a ServeMe ticket to SD create AD id for a new user	No	New user's manager creates ServeMe ticket to SD to add new user to AD.

<b>3.Adding new user to AD</b>	No	The SD employees add user information to AD and informs the user's manager.
<b>4.Create ServeMe ticket for Authorization support group</b>	No	Now user manager creates user authorization request ticket for support group that manages SAP authorizations.
<b>5.Add Access request form to the ticket</b>	No	Manager adds filled excel template including description of the user and the request access.
<b>6.Open the ticket</b>	No	Support group open the ticket and start working on it.
<b>7.Give more information for the support group</b>	No	The support group needs more information either from the user or the requested access.
<b>8.More information form the requestor</b>	No	The requestor gives more information to the support group.
<b>9.Send email to correct approver(s)</b>	No	Support group send email to the approvers responsible of the requested access rights.
<b>10.Send back approval or declinment</b>	No	The approver either approves or declines the access request.
<b>11.Access denies. Close the ticket</b>	No	If the requested access is declined the ticket is closed and requestor informed.
<b>12.Create a child ticket to SD</b>	No	If the requested access needs authorizations groups, then child ticket is created for SD to add AD groups to the user.
<b>13.Add suitable AD groups to the user</b>	No	SD adds needed AD groups to the user.
<b>14.Information of resolved child ticket</b>	No	SD resolves the child ticket and support group managing authorizations receives information of this.
<b>15.Assign requested access in SAP SMA/SMD</b>	No	Authorization support group adds requested access through SMA or SMD client depending of the request.
<b>16.If needed add portal groups to the user</b>	No	If the access requires portal groups are added to the user.
<b>17.Send credentials to the user via email</b>	No	Authorization support group sends starting password and username to the new user via email.
<b>18.Resolve/Close the ticket</b>	No	Authorization support group marks the ticket as resolved.
<b>19.Ticket status updated</b>	No	The information of the resolved ticket is sent to the requestor.
<b>20.Authorization request completed</b>	No	Now user have access to the requested system.
End		

Table 4. New user access request

As described in Figure 3 the authorization process starts when a new person needs access to SAP systems. To start the process manager of the user must create a ServeMe ticket to SD (Service Desk), SD then creates a new user ID for the user and adds the needed information to active directory (AD). When the user can be found in the active directory and has user ID further access rights can be requested. Authorizations are requested by creating a new ServeMe ticket to user management support group and adding "Access request form" to the ticket, the form includes information of the access the caller is requesting.

When the request arrives to the support group responsible for user management the employees check that the request is correctly done and, if needed more information is requested from the caller. After all the required information is gathered the user management personnel see if the request needs approval from pre-determined persons, if approval is needed an email is sent to the correct approver or approvers to be accepted or refused. Then either the request authorization is assigned to the user or the ticket is closed due to refusal of access rights.

Assigning the roles and profiles to the user happens in the on-premise SAP ERP system. The user management personnel assigns requested access to the user by assigning authorization roles and profiles to the user. It is also possible that user needs access to different authorization groups, users are designated to these groups if needed.

Finally, after all required access rights have been assigned to the user the ticket is marked as resolved and information of this transferred to the caller, who has option to accept or reject the resolution. In case of rejection the ticket opens up again and resolving starts again and if the caller is satisfied to the resolution the authorization request has been resolved and the process has come to an end.

### 3.2.2 Managing User Authorizations

The process of user authorization management is visualized below in Figure 4. This process is triggered by the lack of authorizations for the user or change in the user job description.

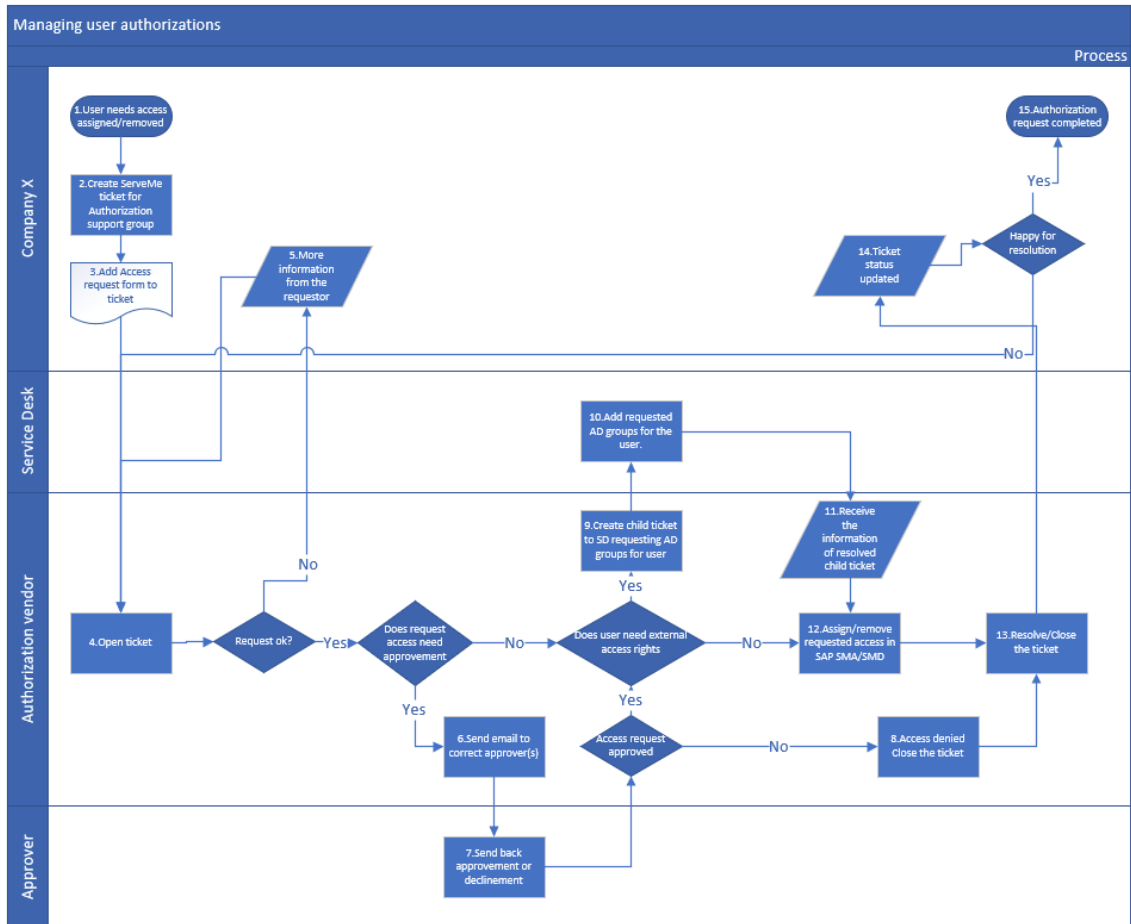


Figure 4 Authorization management process

Table 5 below depicts the process steps in detail.

Step	Automated	Details
Start		
1. User needs access assigned/removed	No	Business notices that user needs access rights assigned or removed due to change in job description or other reason.
2. Create ServeMe ticket for Authorization support group	No	Now user manager creates user authorization request ticket for support group that manages SAP authorizations.
3. Add Access request form to the ticket	No	Manager adds filled excel template including description of the user and the request access.

<b>4.Open the ticket</b>	No	Support group opens the ticket and starts working on it.
<b>5.Give more information for the support group</b>	No	The support group needs more information either from the user or the requested access.
<b>6.Send email to correct approver(s)</b>	No	Support group send email to the approvers responsible of the requested access rights.
<b>7.Send back approval or declinment</b>	No	The approver either approves or declines the access request.
<b>8.Access denies. Close the ticket</b>	No	If the requested access is declined the ticket is closed and requestor informed.
<b>9.Create a child ticket to SD</b>	No	If the requested access needs authorizations groups, then child ticket is created for SD to add AD groups to the user.
<b>10.Add suitable AD groups to the user</b>	No	SD adds needed AD groups to the user.
<b>11.Information of resolved child ticket</b>	No	SD resolves the child ticket and support group managing authorizations receives information of this.
<b>12.Assign/remove requested access rights in SAP SMA/SMD</b>	No	Authorization support group adds or removes requested access rights through SMA or SMD client depending of the request.
<b>13.Resolve/Close the ticket</b>	No	Authorization support group marks the ticket as resolved.
<b>14.Ticket status updated</b>	No	The information of the resolved ticket is sent to the requestor.
<b>15.Authorization request completed</b>	No	Now user access is updated.
End		

**Table 5. Authorization management process**

Figure 4 shows the User authorization management process. The process is similar to authorization process of new user seen in Figure 3 with few differences. The process starts when it is noticed that existing user needs changes in their system authorizations due change in job description or processes. User authorization management could also include extending or abbreviate user validation.



### 3.2.3 Removal of User Authorizations

The removal of authorization has been displayed below in Figure 5. The process is usually conducted when the employee leaves the company and no longer needs access to the systems.

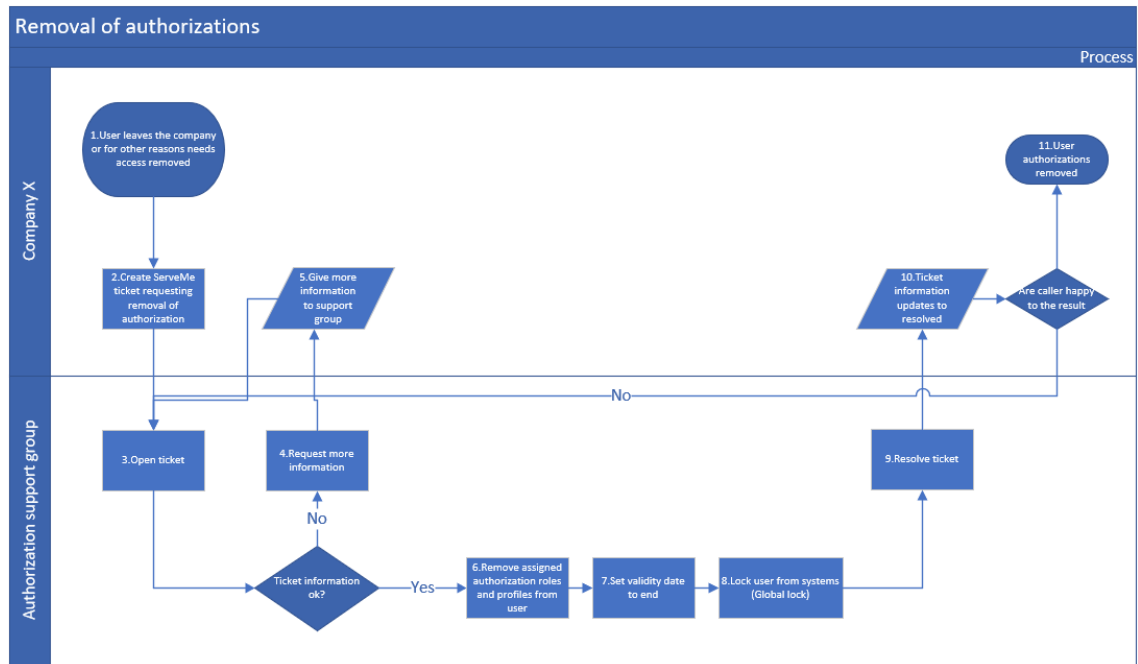


Figure 5 Removal of user authorization

Table 6 below demonstrates the process steps in detail.

Step	Automated	Details
Start		
<b>1. User leaves the company or for other reasons needs access removed</b>	No	Business notices that user needs access rights removed from SAP system due to leaving or change is job description.
<b>2. Create ServeMe ticket for Authorization support group</b>	No	Now user manager creates user authorization request ticket for support group that manages SAP authorizations.
<b>3. Open the ticket</b>	No	Support group opens the ticket and start working on it.
<b>4. Request more information</b>		Support groups requests more information about the user in question from the caller.
<b>5. Give more information for the support group</b>	No	The support group needs more information of the user.
<b>6. Remove assigned authorization roles and profiles from the user.</b>	No	Support group removes all existing authorizations from the user in SAP.
<b>7. Set validity date to end</b>	No	Support group sets users validity to end.
<b>8. Lock user from systems (Global lock)</b>	No	Support group set global lock to user which enables access to all SAP systems.
<b>9. Resolve ticket</b>	No	Support group marks the ticket as resolved.
<b>10. Ticket status updated</b>	No	The information of the resolved ticket is sent to the requestor.
<b>11. User authorizations removed</b>	No	User no longer has access to the SAP systems.
End		

**Table 6. Removal of user authorization**

As Figure 5 above shows, the removal of user authorizations is relatively straight-forward. The first step of this process is to create a ServeMe ticket to Service Vendor Y. The support group opens the ticket and review the information on the ticket is sufficient to continue. More information is requested and provided if needed.

After the support group has all the needed information, they start by removing all assigned authorization roles and profiles the user in question has in the systems and was

requested to remove. Next the user's validity date is set to end on the requested date and the user is locked from the systems. Lastly the support group marks the ticket as resolved and information about this is send to the requestor.

### 3.3 The Strengths of Current State

Based on organized interviews and personal observations at Company X the strengths of the current process were discovered. The strengths of the current user authorization processes are the following: it is well thought and relatively simple and therefore easy to understand. The processes also highly reduce the risk of users to abuse their user access rights in the system.

Granting access is based upon business approvals, which also is a major strength. A business end user authorization must always be approved by a business person and this is true for this process.

When correctly performed, the current processes are efficient and time saving. To perform the process correctly it requires certain level of knowledge on the system and authorizations. The consultation of authorized personnel acting as approvers to different access rights reduces risk of wrongdoing.

### 3.4 The Weaknesses of Current State

Based on organized interviews and personal observations at Company X the weaknesses of the current process were discovered. The researcher determined the weaknesses of the case company's current process to be the lack of knowledge of the process, scattered documentation, and exceptions to the process in different business areas.

The lack of knowledge of the process is seen in large amounts of wrongly done service requests which take time to correct or gather vital information from the requestor. The scattered documentation makes it unreasonably difficult to sometimes contact correct approver when there are changes that are either not documented or are documented poorly. Probably the biggest weakness of the current processes is that there are too many situations which fall outside of the process as they are exceptions. These exceptions take time to learn and recognize which make whole service slower and more

unpredictable. An exception means that there are different approver or approvers compared to the process set in place and just by looking at the authorization request it should be recognized as an exception.

The process also requires many manual steps. The more manual steps are included the more prone for errors the process is. With a workflow-based tool that steers the task automatically to the next actor this could be reduced as all steps now require monitoring from the next actor to be picked up.

Also auditing afterwards is difficult, for example finding the ticket related to a specific change is extremely hard. All user role assignments should always be auditable in order to ensure that no unauthorized changes are occurring. This is not fully possible with the current process in place.

### 3.5 Key Findings from the Current State Analysis

This section provides an overview of the main strengths and weaknesses identified in the current state analysis. The data for the current state analysis was gathered through observations and interviews of employees of Vendor Y working closely with the process. The CSA of the user authorization management processes in Company X revealed a few strengths and weaknesses. The user authorization process has been created in the past and the objective is to implement it to the cloud environment with possible improvements. The overview of the strengths and weaknesses of the current state is presented in Figure 6 below.

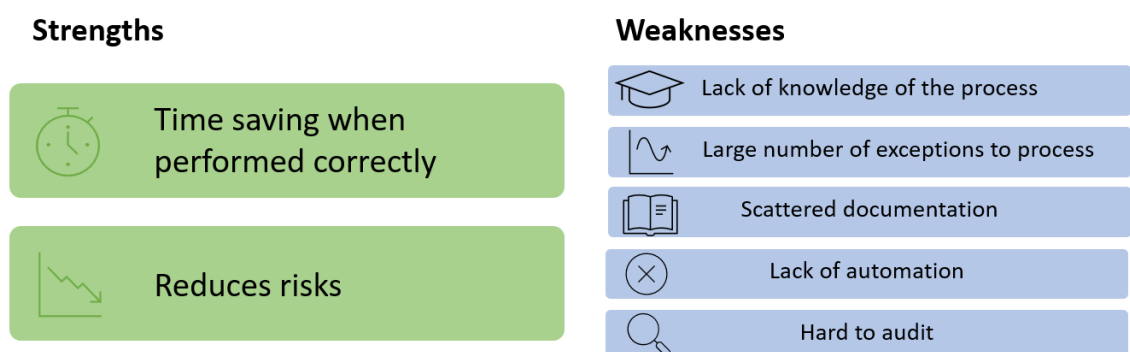


Figure 6 Strengths and weaknesses

As seen on the Figure 6, above Company X's current authorization process includes strengths and weaknesses which are potential areas of improvement. The current process is time saving when performed correctly and reduces risks of misuse.

During the current state analysis a few areas of improvement were also discovered. First, there is lack of knowledge of the defined process in Company X which is seen in the service requests lacking vital information. This leads to the service taking more time to gather information than actual solving the request. Second, a large number of requests do not follow the defined process but are exceptions. Due to the large amounts of these situations. It is hard to document solutions which makes them mostly relying on employee's memory and experience. The third area of improvement was documentation, it was discovered that in certain situations documentation was scattered through multiple files and databases, which makes it difficult to find correct information related to the problem. Also changes in certain documentation was poorly updated which has led to outdated information on documentation. The large amount of roles in the current system and lack of automation in the authorization process makes it almost impossible to reliably audit the access rights assigned to the users in the system. In the following section the study focuses on best practices found in literature on dealing with the weaknesses revealed by the CSA and how to develop these areas.

## 4 Existing Knowledge

This section discusses theories on identity and access management, IT service management and best practices on the subjects. This section also discusses the related theories on process building and knowledge management. As the goal of the study is to create a proposal for the user authorization process which can be implemented to the new cloud system in the future, related theories and practices have been studied to achieve as comprehensive result as possible. The described theories were used to form a conceptual framework which is presented at the end of the chapter.

### 4.1 Identity and Access Management

Identity and access management (IAM) is developing, defining, and managing authorization roles and access privileges of individual users in the network. The process in which users are granted privileges are part of identity and access management. It is used to authenticate users, devices, or services and to grant or deny rights to access data and other system resources. (Strom, 2018)

#### 4.1.1 Authorization Mechanisms

Authorization is the process of permitting or disagreeing an authenticated user's access to predetermined content or resource. The authorizations that a user has in the system decides what user is allowed to perform in the system or application. (Indu, Anand and Bhaskar, 2018) There are multiple different ways to control the access to applications and private information of which five are more closely discussed in the next chapters.

First, mandatory access control (MAC) is the traditional mechanism to define access rights of users. The permissions in the MAC mechanism are granted through the operation system or security kernel. Access rights are set by the manager of the system and imposed by security kernel. The different clients connected to the system cannot change these rights locally. The mandatory access control assigns classification label to each file system object, these classifications are divided into a confidential, a secret, and a top secret. Each of the users and devices is assigned similar classification label which are checked by the system and security kernel while accessing a particular resource or

information. To keep all the classifications of resource objects and users up to date the mandatory access control requires frequent monitoring and careful planning. The MAC mechanism offers great security aspects in accessing to data and resources but is less flexible environment to managing access rights of the users. (Indu, Anand and Bhaskar, 2018)

Second, discretionary access control (DAC) is a method to control security access. It manages users access rights through data owner. The validation of the users' access rights is performed during the user authentication which is usually when user validates identity by providing username and a password. In DAC, all files and data have an owner who determines the access privileges required to view or manage this resource which gives the method its name, discretionary access control. The upside to DAC is that it's more flexible than MAC but the downside is that it's not as secure. (Indu, Anand and Bhaskar, 2018)

The third way of access control is referred as entitlement or task-based access control. In this access control method each task, action or process requires a specific access permission. Permissions are represented by entitlement or task which are assigned to the user. The pros of this access control method are that it can handle very specific and complex authorization needs of special situations although the process of granting the access rights is slow as the users need to create separate request and get approval for each entitlement or a task. The entitlement or task-based access control can be used in addition to other access control methods to increase flexibility to certain situations. (Indu, Anand and Bhaskar, 2018)

Fourth method, role-based access control (RBAC), provides access rights for the user through roles and privileges. The roles are classified into two separate categories, technical roles, and business roles. Technical roles contain combination of different permissions to the application. Business roles are combination of different technical roles which gives permissions to work on certain job description. RBAC is well suited for big organizations as it provides administration security with large number of users and permissions. RBAC offers highly secure environment for access control. The permission for accessing to data are provided to the user based on three rules, role assignment, role authorization and permission authorization. As assigned roles may change from time to time the main weakness of RBAC is that the roles also must be managed by then and validate the changes in a real-time environment. (Indu, Anand and Bhaskar, 2018)

Fifth and final access control discussed is attribute-based access control (ABAC). As the name suggest the access permissions of the user are controlled by different attributes. The different sets of attributes are checked by the system to define access rights of the user. The considered attributes are subject attributes, object attributes, resource attributes and environmental attributes. This results that in ABAC model each users' roles and privileges are pre-defined which solves many authorization problems, is efficient and provides flexibility in implementation. (Indu, Anand and Bhaskar, 2018)

#### 4.1.2 Best Practices of Identity Access Management

Identity and access management (IAM) is one of the foundations of cloud security. As more organizations turn to mobile-friendly and cloud-based platforms, the need to provide a safe and secure place to store identifiable information becomes more important. (Bouk, 2019) In the following chapters best practices of identity access management are discussed. Best practices have been found in the relative literature.

Nowadays as technology is rapidly improving and data is accessible in the cloud, security is more important than ever. Strong authentication factors are important to organizations as they verify trusted identities. Identity and verification at the user-level is where today's security perimeter really lies. (Bouk, 2019) To ensure authentication of the user and reduce abuse or misuse of credentials enforcing strong passwords are a mandatory. National Institute of Standards and Technology (NIST) has come up with following guidelines to password security. Minimum length of the password should be at least eight characters, restricting commonly used and context-specific passwords and restricting password obtained from previous data breaches. NIST also recommend use of special characters in the passwords and not to use sequential and repetitive characters. (Bouk, 2019)

When it comes to what method of access control to use it depends on the business. Certain methods are easier to implement and offer different strengths to the organization. Role based access control is recommended as an authorization method for large organizations. The RBAC model ensures quick on-boarding of employees and contractors to the organization structure which saves on-boarding cost and time and the attribute-based access control or ABAC authorization mechanism is recommended for multi-party cloud



infrastructure sharing as it offers flexible and dynamic operations. (Indu, Anand and Bhaskar, 2018)

In the identity access management, it is best to remember to balance accessibility and security. Multiple layers of security may reduce productivity in the long run. In order to maintain the core benefit of cloud environment there should not be too many layers that potentially restrict the productive value the organization is getting from cloud environment. (Bouk, 2019)

## 4.2 Information Technology Service Management

IT service management (ITSM) is how organizations, and their teams provide the end-to-end IT service of their choice to their customers. ITSM includes all activities and processes from designing to supporting IT services. As the core concept of ITSM Atlassian states that IT should be delivered as a service. (Atlassian, 2020)

In today's technological world services are the main way the organizations use to create value for themselves and their customers. Improving IT service management capability can lead to tremendous benefits to organizations as almost all services today are IT-enabled (Axelos, 2019).

According to Atlassian the IT Information Library (ITIL) is the most widely accepted approach to ITSM. ITIL focuses on practices for aligning IT services with business needs. ITIL can help organizations adapt to ongoing transformation and scale (Atlassian, 2020). In the ITIL Foundation: ITIL 4 Edition (2019) Axelos defines service management as a set of specialized organizational capabilities for enabling value for customers in the form of services (Axelos, 2019). In the following chapters the values and guidelines of ITIL and how organizations can benefit from it is more widely discussed.

### 4.2.1 ITIL 4

IT information library or ITIL is a collection of best practices used in the IT service management and ITIL 4 is the latest edition of the collection. ITIL 4 provides a guideline for utilizing the potential of modern technology to overcome the service management challenges. It is designed to ensure a flexible, coordinated, and integrated approach for

effective governance and management of IT-enabled services. The ITIL 4 framework focuses on two key components which are the ITIL service value system (SVS) and the four-dimension model. (Axelos, 2019)

The ITIL service value system is presentation of how different activities and components of the organization work together to facilitate value through IT-enabled services. The ITIL focuses on combining these together in flexible manner to provide strong, unified, and value-focused guidance to the organization. The system sees opportunity and demand as an input which can be used to generate value as an output to all stakeholders. (Axelos, 2019)

The SVS describes guiding principles which are set of recommendations that can guide an organization regardless of its management structure or changing goals and strategies. The ITIL 4 guiding principles have been described in the Table 7 below. (Axelos, 2019)

<b>Guiding principle</b>	<b>Description</b>
Focus on value	All organisation's actions should have direct or indirect positive impact towards value
Start where you are	Utilize already available resources inside the organization by investigating current state thoroughly.
Progress iteratively with feedback	Plan progress to smaller manageable sections that is easier to focus on and give feedback.
Collaborate and promote visibility	Work together across boundaries. Avoid hidden agendas and share information to the greatest degree possible.
Think and work holistically	Working holistically gives greater value to the service provider and service consumer.
Keep it simple and practical	Eliminate process, action, or service if it does not provide value to the stakeholders. Always use minimum number of step necessary to reach objective.
Optimize and automate	All resources should be used to their full potential.

**Table 7 ITIL 4 Guiding principles**

The guiding principles described above contains the core messages of ITIL practices. These principles support successful actions and better decision making inside organization in any type of service management level. Principles can be used inside organizations to match special needs and circumstances. (Axelos, 2019)

Other core component of ITIL 4 are the four dimensions. The four dimensions of service management presented in ITIL 4 are organizations and people, information and technology, partners and suppliers and value streams and processes. The four dimensions are

outlined to ensure a holistic approach to service management. By focusing on these four dimensions, it gives great base to keep SVS effective and balanced inside the organization. If organization fails to address all four dimensions in their strategy properly it may result services not meeting the expectations, or it will decrease their quality or efficiency. (Axelos, 2019)

Organizations and people are the first dimension of service management. This dimension focuses on organizational structures, people and how they are managed. It is important that every person inside the organization understand own responsibilities to the customer and stakeholders. These responsibilities and roles of employees should be well structured, and they should support an overall strategy. When managing people not only their skills and competencies should be considered but also their collaboration and communication skills as well as leadership styles. (Axelos, 2019)

The second dimension is information and technology which includes information and knowledge as well as the technology required to manage IT services. The technologies in question could be workflow management systems, knowledge bases, communication systems or analytical tools that organizations use in their daily operations. The IT services is developing all the time and changes with new developments in technology which can be used to increase value of the service.

According to ITIL 4 the partners and suppliers are the third dimension. The key message of this dimension includes that all partners and suppliers should determine relationship with each other that is mutually beneficial. It also encourages a continual improvement of services to all stakeholders. This dimension also covers contract and other formal agreements with partners. (Axelos, 2019)

The fourth and final dimension of service management is value streams and processes. This dimension outlooks various parts of the organization and how they are integrated and managed to create value to all stakeholders. To get most benefits out of the service provided, it is important to an organization to identify and understand its various value streams. When organization understands its value streams it can develop to them as effective as possible. (Axelos, 2019)

### 4.3 Knowledge Management

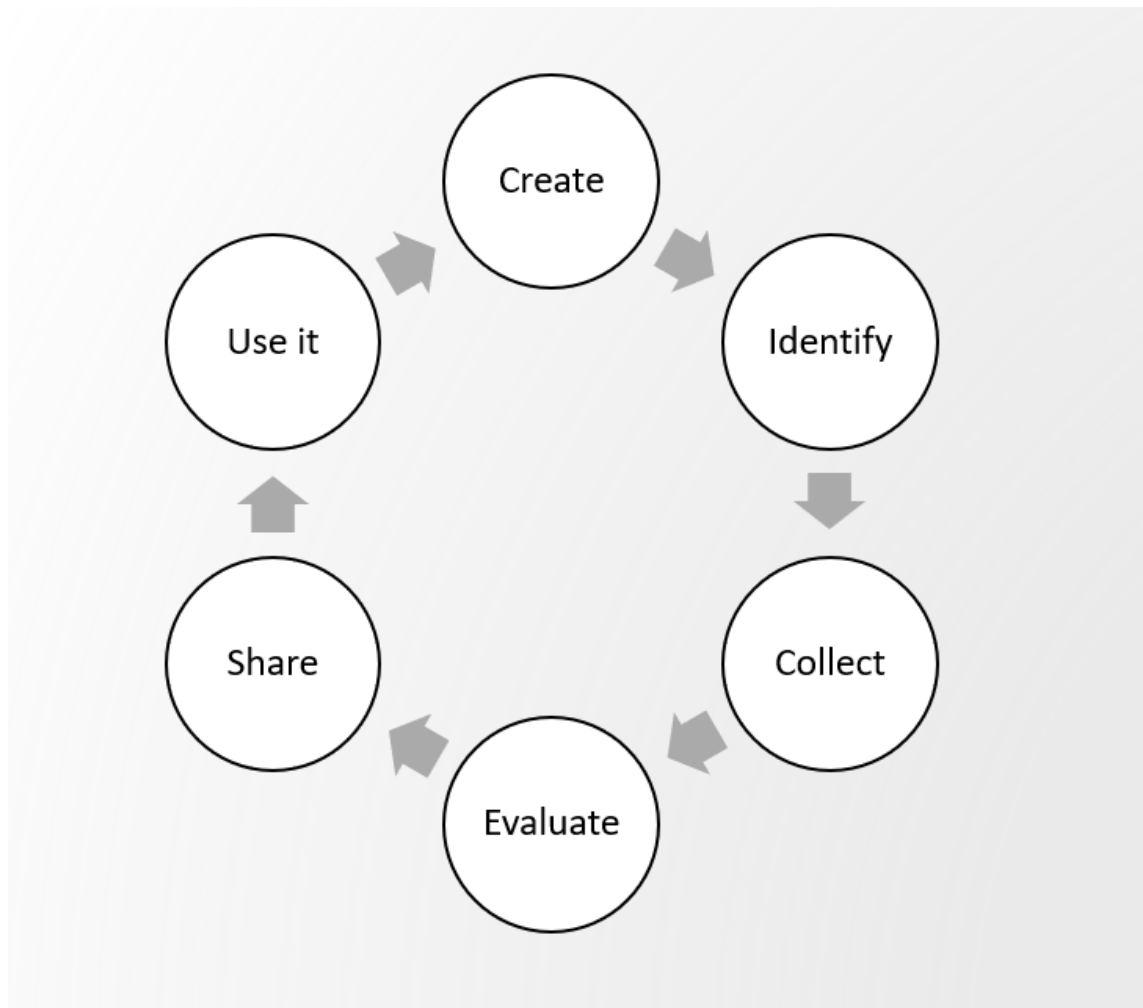
Knowledge Management (KM) is described as “the process of capturing, distributing, and effectively using knowledge” (Davenport, 1994). According to ITIL 4 (2019) the purpose of KM practice “is to maintain and improve the effective, efficient and convenient use of information and knowledge across the organization.” As seen the knowledge management can be interpreted differently but the main goal to effective use of knowledge stays the same. It is important to understand that knowledge is not simply information. Knowledge is the use of information in a particular context (Axelos, 2019).

#### 4.3.1 Components of Knowledge Management

According to American Productivity & Quality Center (APQC) knowledge management contains four different components discussed below.

Firstly, people are significant part of the knowledge management and all other parts of the organization. There must be the right people involved to knowledge management to be efficient. To have an efficient KM program the organization needs two kind of people, senior leaders, and cross-functional stakeholders. Senior leaders to provide sponsorship and insight into broader organizational strategy, and cross-functional stakeholders to guide implementation (APQC, 2019).

Secondly, strong processes offer the best possible platform for knowledge management to flourish. APQC (2019) has identified seven-step cycle for processes through the organization. These seven steps include create new knowledge, identify the knowledge critical to the strategy, collect knowledge to be shared, evaluate the knowledge, share it through various channels, access it and use it to solve problems efficiently. Seven steps visualized below in Figure 7.



**Figure 7 Seven steps of KM**

In Figure 7 the seven steps of knowledge management according to APQC (2019) have been visualized. The steps should always be continuous and because of that the knowledge management should be constantly improving inside the organization. (APQC, 2019).

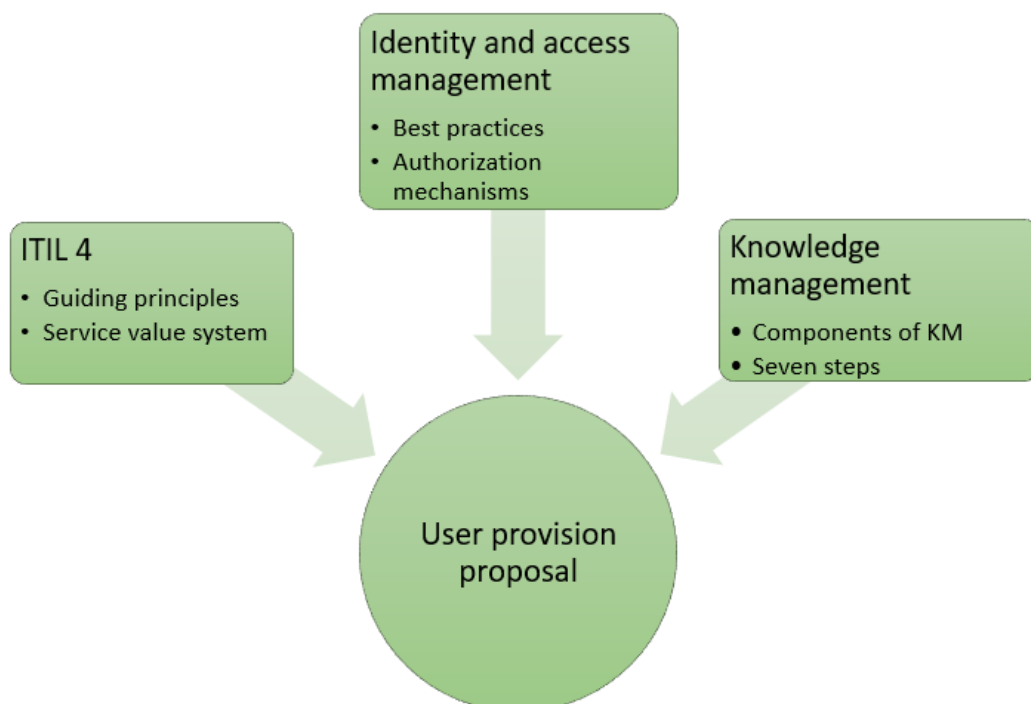
Thirdly, effective KM demands content management. Content management includes any kind of documented knowledge. To have effective KM all content should be efficient and accessible. Various IT systems has made content management more straightforward as creating, preserving, and accessing information is effortless nowadays. The main purpose of content management is to make the knowledge available to everyone in the organization (APQC, 2019).

Fourth, KM must have clear, documented, and business-related strategy. According to APQC (2019) every beneficial KM strategy must have value proposition of KM, a budget,

expected impact of KM and the tools, approaches and roles that are required for the organization to get there (APQC, 2019).

#### 4.4 Conceptual Framework of This Thesis

The literature of this thesis was selected to best match the objective of the thesis and the weaknesses of the previous process. As the process in question is related to identity and access management the best practices and mechanisms of IAM were studied, and as knowledge management was identified as weakness of the current process it was researched to improve the process. The guiding principles of the IT infrastructure library's most current edition was taken into account in order to create a process that generates as much value as possible to the stakeholders. Based on the literature discussed the conceptual framework for this thesis was created. Figure 8 below presents the most important points of the literature that was collected to create the proposal of the authorization process.



**Figure 8 Conceptual framework**

The next section describes how the proposal was made based on related literature and what it includes.

## **5 Building a Proposal on Authorization Process for the SAP IBP Cloud Tool**

This section discusses the results of the current state analysis, conceptual framework and the second data collection, and how different stages of this study have impacted the proposal building. The first is the overview of the proposal building which focuses on how the proposal was built and what has affected it. After the overview, the proposal is explained and visualized, and how the case company could implement and benefit from it.

### **5.1 Overview of the Proposal Building Stage**

The goal of this thesis is to create a new user authorization process proposal for Company X that can be implemented to work in collaboration with the service provider to manage user access in the SAP IBP cloud tool. The new cloud tool requires a new authorization process.

The current state analysis was conducted in order to discover the strengths and weaknesses of the current authorization process and to use this information when building the proposal. The discovered weaknesses were a large number of exceptions to the process, lack of knowledge of the process, scattered documentation to solve occurring problems, lack of automation and the current process is hard to audit. This thesis focuses on developing the first three mentioned directly and the remaining two indirectly.

The proposal building was conducted in three steps. The first, based on the discovered areas of improvement, related literature was researched, and conceptual framework was created to further support the proposal building. Related literature consisted of, but not limited to, Information Technology Infrastructure Library (ITIL), best practices from knowledge management and identity and access management.

Second, a workshop meeting was organized with stakeholders to discuss the needs and strategies of Company X as well as areas of improvement. The discussions of the workshop were documented and analyzed to recognize all parts of the process that do not create value to the stakeholders.

Third, the first draft of the proposal was created and visualized, based on the workshop discussions, the theories studied in section four and most recent documentation released by SAP regarding user management for the IBP cloud tool.



## 5.2 Findings of Data Collection 2

The collection of Data 2 was conducted in two steps, the first was an online workshop organized with the stakeholders which focused on the new authorization process and the discovered weaknesses. The second step was to study the best user management practices for an SAP IBP cloud tool from recently published e-book by SAP PRESS.

	<i>Key focus area from CSA (from Data 1);</i>	<i>Suggestions from stakeholders (Data 2)</i>	<i>Description of the suggestion</i>
1	Lack of knowledge of the process	Assign responsible key users who will create the user access requests.	The users contact key users to request access rights. The key users will make the request according to the process.
2	Scattered documentation	All documents to be found in one place.	As the cloud tool is new there currently is not any documentation therefore a new documentation is created and placed in one place. The documentation will share information to the service team.
3	A large number of exceptions to the process	The new process created and implemented.	All the future changes in the cloud tool will be done according to the process and exceptions are taken to minimum.

**Table 8 Stakeholder's suggestions for proposal building**

As seen in Table 8 above, the key focus areas were discussed, and suggestions gathered from the stakeholders. Below the development areas are discussed from the view of ITIL 4, identity and access management and knowledge management.

### 5.3 ITIL 4

As the Company X is implementing a new cloud tool it does not currently have any user management processes in place for the tool in question. The literature was studied to create process chain that follow the guiding principles of the ITIL 4. The 7 Guiding Principles of ITIL 4 are the key messages of ITIL. They are designed to guide decisions and actions, so these best practices can be beneficial for people who are responsible for managing and operating the organization's services. The guiding principles are following and are described in more detail in chapter 4.2.1:

- Focus on value
- Start where you are
- Progress iteratively with feedback
- Collaborate and promote visibility
- Think and work holistically
- Keep it simple and practical
- Optimize and automate

The guiding principles were used to build authorization process proposal that creates as much value as possible to the stakeholders. The visualization of the proposal is seen in chapter 5.6.

### 5.4 Identity and Access Management

Related literature was studied and discussed in chapter 4.1 and to implement these best practices from literature to the practice the User management for SAP IBP e-book was brought along. The e-book focuses on the practical possibilities of user management in the SAP IBP cloud tool and was used to understand which practices were possible and wise to implement into the proposal.

With the information acquired from the literature the proposal of the process was drafted and it was discussed with the stakeholders to decide on few key strategies that Company X wants to implement into the process. These strategies included vital information to the process building like the authorization mechanism Company X chose to use in the cloud tool which affects the process. The different authorization mechanisms are discussed in more detail in chapter 4.1.1. The process was then played out in the test environment of the cloud tool to ensure it was correctly formulated.

## 5.5 Knowledge Management

Currently the service provider relies heavily on the employees' existing knowledge when it comes to solving certain problems. These problems include everyday problems which are relatively easy to solve quickly from memory and problems that employees need to check the instructions which are sometimes difficult to find or are outdated.

This makes it possible for experienced employees to solve even difficult problems quickly when they know the answers from memory, but for new and unexperienced employees it would be difficult to find correct instructions from the instructions that are scattered to different folders or from instructions that are outdated. There is also silent knowledge in the company where certain employees have acquired knowledge on specific problems and can be asked to assist on these when needed.

This can speed up the process and create risks inside it because the easiest way to solve a problem quickly is to ask peers who have acquired necessary knowledge on the problem for assistance. This can on the other hand put unnecessary burden on the helping employee and consume employee's time. The silent knowledge also creates a risk of losing the knowledge altogether if an employee who has acquired the knowledge leaves the company.

### 5.5.1 Proposed Practices for Knowledge Management

The proposed practices are aimed to focus on reducing risks, increasing efficiency and business continuity.

The first proposed practice is to centralize as much information and instructions as possible to one place and simplify it to make service as efficient as possible by reducing time

employees use to look for the instructions. The instructions should also be checked periodically. This could be done by one person or a small team that check all instructions periodically or by having every employee check the instructions they made periodically. This makes sure that the information stays up to date.

Second proposed practice is to encourage the employees to share knowledge. The shared knowledge inside the company allows employees to work more efficiently and reduce risks. This ensures business continuity even when there are changes in the staff.

### 5.6 Proposal Draft

The first proposal of the user management processes is presented below. The proposal includes three situations which are following: New user access request, maintaining user access and removing user access. Firstly, all the processes are presented and described separately, and the development areas discussed in the end.

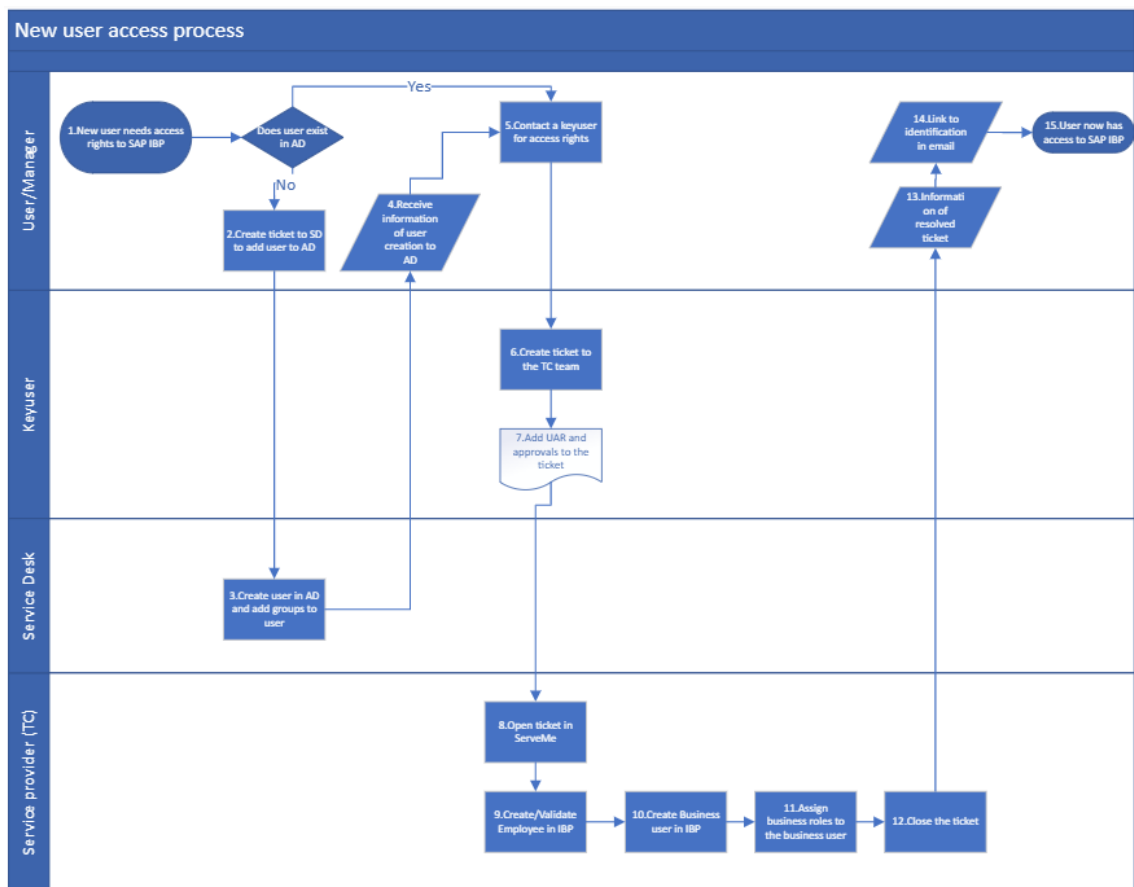


Figure 9 New user access process proposal

Table 9 below displays the process steps in detail.

<b>Step</b>	<b>Automated</b>	<b>Details</b>
Start		
<b>1.User need access rights to SAP IBP</b>	No	A new user needs access to SAP IBP due to changed job description or arrival to company.
<b>2.Create ticket to SD to add user to AD</b>	No	Manager of the user creates ticket for Service Desk to create user in AD.
<b>3.Create user in AD and add groups to the user</b>	No	Service Desk creates AD id for the user.
<b>4.Receive information of the AD creation</b>	No	The manager of the user receives information of the created AD id.
<b>5.Contact key user for access rights</b>	No	The manager of the user contacts key user to require SAP IBP access rights for the user.
<b>6.Create ticket to service provider</b>	No	The key user creates ServeMe ticket to service provider to request access rights for the user.
<b>7.Add UAR and approvals to the ticket</b>	No	The key user adds User access request and approval to add the access rights to the user on to the ticket.
<b>8.Open ticket in ServeMe</b>	No	Service provider opens the ticket and starts working on access request.
<b>9.Create/Validate Employee in IBP</b>	No	Service provider creates employee in IBP or validates that user exist in the IBP system.
<b>10.Create Business user in IBP</b>	No	Service provider creates a business user based on the employee profile of the user.
<b>11.Assign business roles to the business user</b>	No	Service provider assigns business roles to the business user in IBP.
<b>12.Close the ticket</b>	No	Service provider marks the ticket as resolved.
<b>13.Information of resolved ticket</b>	No	The requestor gets information of the resolved access request.
<b>14.Link to identification via email</b>	Yes	The user gets email link to identification services via email to identify and start using SAP IBP
<b>15.User now has access to SAP IBP</b>	No	User now has access to SAP IBP and process is completed.
End		

**Table 9. New user access process proposal**

New user access request starts when a new user needs access to the SAP IBP cloud tool in Company X. First the user is added to Company X's Active Directory which is required later to identify to the tool. Next the manager of the new user contacts a key user who has acquired relevant training of the cloud tool and access rights inside it. The key user creates ticket to the Service provider including information of the access rights requested for the user.

The service provider gets a notification of the created ticket and starts resolving it. First, the service provider ensures that the user's employee profile is found in the IBP cloud tool and if not, it is created there. Then the business user is created based on the employee profile and the requested business roles are assigned to the business user. After the roles have been assigned to the user the service provider closes the ticket and the information of resolved user access request will be send to the new user or manager. Lastly, the new user logs on to the cloud tool through identity access service which is connected to the company's active directory.

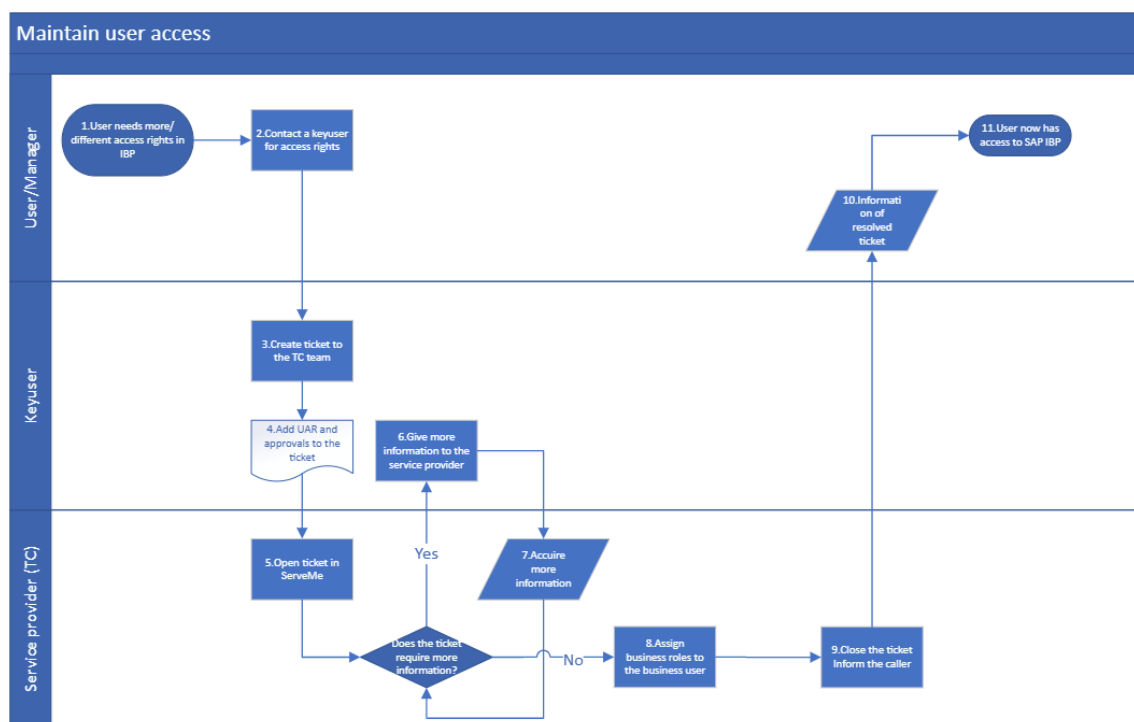


Figure 10 Maintain user access process proposal

Table 10 depicts the process steps in detail.

Step	Automated	Details
Start		
1. User needs more/different access rights in IBP	No	The process starts when there is need for access rights update due to change in job description.
2. Contact key user for access rights	No	User or manager of the user contacts key user for access right update.
3. Create ticket to service provider	No	The key user creates ServeMe ticket to service provider to request access rights for the user.
4. Add UAR and approvals to the ticket	No	The key user adds User access request and approval to add the access rights to the user on to the ticket.
5. Open the ticket in ServeMe	No	Service provider opens the ticket and starts working on access request.
6. Give more information to the service provider	No	Key user gives additional information to the service provider if needed.
7. Acquire more information	No	Service provider acquires the necessary information.
8. Assign business roles to the business user	No	Service provider assigns business roles to the business user in IBP.
9. Close the ticket and inform the caller	No	Service provider marks the ticket as resolved.
10. Information of the resolved ticket	No	The requestor gets information of the resolved access request.
11. User access updated	No	Users access rights have now been updated.
End		

**Table 10. Maintaining user access proposal**

The maintain user access process is similar to the new user access process. As the user already exists in the IBP there are a few steps that are not required. First, the user itself or manager of user contacts the key user who again creates a ticket with all the required information to the Service provider. Then the service provider makes the requested changes in user rights in the IBP and marks the request as resolved. The user or user's

manager receives the information of the resolved request and can now adjust working with updated access rights.

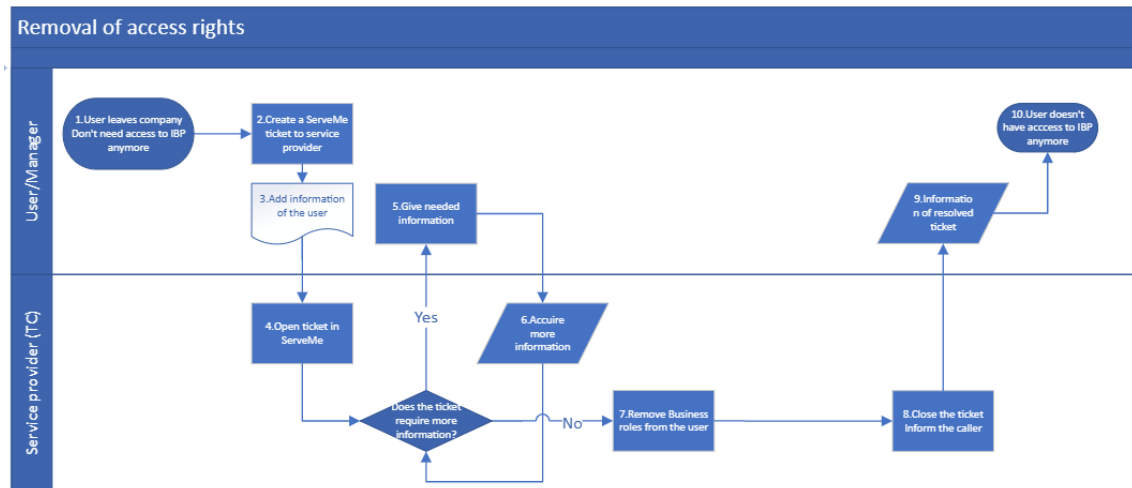


Figure 11 Removal of user access process proposal

Table 11 below presents the process steps in detail.



Step	Automated	Details
Start		
<b>1.User leaves company/Do not need access to IBP anymore</b>	No	Due to change in job description or leave user doesn't need access to SAP IBP anymore.
<b>2.Create ticket to service provider</b>	No	Create ServeMe ticket to service provider to request removal of access rights from the user.
<b>3.Add UAR to the ticket</b>	No	The key user adds User access request to the ticket.
<b>4.Open the ticket in ServeMe</b>	No	Service provider opens the ticket and starts working on access request.
<b>5.Give more information to the service provider</b>	No	Caller gives additional information to the service provider if needed.
<b>6.Acquire more information</b>	No	Service provider acquires the necessary information.
<b>7.Remove business roles from the user</b>	No	Service provider removes business roles from the user.
<b>8.Close the ticket and inform the caller</b>	No	Service provider marks the ticket as resolved.
<b>9.Information of the resolved ticket</b>	No	The requestor gets information of the resolved access request.
<b>10.User access updated</b>	No	Users access rights have now been updated.
End		

**Table 11. Removal of user access proposal**

The removal of user access process is straight-forward. It is triggered when the user leaves the company or for some other reason does not need access rights to cloud tool anymore. The manager creates a ticket which includes the information of the access requested to remove to Service provider. The service provider opens the ticket and ensures all required information has been provided and process to resolve the request. The business roles of the user are removed in the cloud tool and the ticket is resolved; the user no longer has access right is SAP IBP cloud tool.

The main developments of the proposal are related to the new user access and the maintain user access processes. In both processes the key user has been implemented to play an important role and all the requests come through the designated key users.

Implementing the key users ensure that all the requests are done according to the process and provide all required information to resolve the requests. This will make the whole process more reliable and efficient because the most time-consuming part of the old process was to gather the required information to resolve the request or that the requestor was not aware of the process behind requesting access rights. The other development to the old new user access process is that the identification to IBP cloud tool goes through IAS and does not require the service provider to set and send starting credentials to the users which also makes the process more efficient.

In the next chapter the validation of the proposal draft is discussed with the stakeholders. Based on the feedback the initial proposal will be further developed and the final proposal of the study is presented.

## 6 Validation of the Proposal

This section discusses how the validation of the proposal was conducted and how the validation affected the initial proposal. At the end of this chapter is recommendations for Company X of the next steps to ensure process functionality in the future.

### 6.1 Overview of the Validation Stage

The validation of the proposal presented in Section 5 was conducted by organizing a meeting with the stakeholders. The agenda of the meeting was to discuss the topic of this study and how the process proposal was built. The key idea of the validation was to discuss how the presented proposal is designed to improve the weaknesses of the current process identified in the current state analysis in Section 3 and gather feedback from the stakeholders.

With the feedback gathered from the stakeholders in the organized meeting, the final proposal was set and an action plan for the next steps towards implementation was made and further development ideas identified.

### 6.2 Findings of Data Collection 3

The data was gathered as feedback from Company X's Development Manager, Solution Designer and Vendor Y's Director in the meeting. The participants showed their satisfaction to the presentation and described it as clear and well-structured. The development manager also gave feedback that the correct pain points have been identified and correct conclusions were made in the proposal.

The comments to the proposal from the stakeholders were the following:

- Well-structured and clear proposal
- Key pain points identified and correct conclusions made
- It is important to focus on the key user training as they will have great responsibility in the future process

- Well thought presentation, from the flowcharts it can be seen that the new process will have far less steps than the current one in place

### 6.3 Final Proposal

The process proposal stayed similar to the one described in a form of flowchart in chapter 5 during the validation. The stakeholder's feedback focused mainly on the implementation of the proposal. The next steps towards implementation were more closely discussed with the stakeholders in the meeting.

With the data gathered, recommendations towards implementation were planned more carefully and are discussed in more detail below. The possibility of further development by implementing an additional tool was also discussed and the stakeholders were intrigued of the idea although recognized that it was outside of the scope of the study.

### 6.4 Recommendations for the Next Steps

As part of this study, three steps towards implementation of the process are recommended to the case company. The three steps are designed to enable as smooth implementation as possible and to avoid pitfalls.

First, the case company should assign key users who are responsible for the process. It is important to put focus on the training of the key users as they will have great part on the provision process and will act as approvers of the user access requests in the future. To have as efficient process as possible the key users should be taught the process closely and they should be informed of their responsibilities.

Second, the number of roles and users in SAP IBP should be kept in minimum. Creating users and roles to the IBP environment only when necessary, ensures easy maintainable process and prevents the number of roles from reaching a point where it is difficult to manage changes and responsible personnel. This recommendation is in line with ITIL 4 guiding principle "Keep it simple and practical" which is described in more detail in chapter 4.

Third, the case company would benefit from periodically updating relevant documentation. This will ensure that all parties are up to date with possible changes to the process, its key users/approvers in case of change in job description or leave. In order to maintain up to date documentation, responsible personnel should be assigned to this task.

## 7 Conclusions

In this section the conclusions of the study are discussed. This section contains three parts, first the executive summary explains the key result of the study and how the results were achieved. Second, the thesis evaluation discusses if the study reached to its objective and this section finishes with is the closing words of the study.

### 7.1 Executive Summary

The objective of this study was to develop a user authorization process proposal for an SAP IBP cloud tool. The objective was relevant to the case company, Company X, as they are implementing a new cloud tool to their business and therefore required an authorization process for it. In addition to the necessary requirement of authorization process, the case company also wanted to discover ways to improve the current process to be more efficient in the future.

The project was started by planning the timeline and the steps required to reach the objective. The steps included first observing the current authorization process and organizing interviews with relevant personnel to discover possible areas of improvement of the process. The CSA carried out done for the on-premises authorization process of the ERP system Company X is using and based on the research steps mentioned, the strengths and weaknesses were revealed. The identified weaknesses chosen to develop were the following:

- Lack of knowledge of the process
- Large number of exceptions to process
- Scattered documentation

Based on the identified weaknesses the related literature and theories were investigated. After the relevant theories were studied the improvement proposal was built in collaboration with the stakeholders.

The proposal includes the three most common situations of the authorization process: new user access, maintaining user access and removing user access. The proposal focuses on making the user authorization process as efficient and valuable as possible. By implementing the knowledge from theories and workshops with the stakeholders the

proposal was built. The outcome of the project was a visualized proposal portrayed as a process diagram. The diagram shows the improved steps of the process. The key improvements were increased reliability and decreased time consumption by adding trained key user as part of the process. The key user ensures the requests are done according to the process and is also responsible for the approval of the authorizations. The change is designed to tackle the bottlenecks of the old process flow.

The validation was conducted by organizing a meeting where the proposal and next steps to implement it were presented to the stakeholders and feedback was gathered. Based on the feedback gathered the final proposal was formed.

The proposal is intended to help the case company and their service provider to have more efficient collaboration. The service provider will be able to solve the user access request in less time with more reliability. As of result of this, Company X employees whose job description requires access to the cloud tool will receive correct access rights more rapidly. The user authorization process will affect multiple personnel groups so constructing it to be as efficient as possible is truly valuable for the case company.

## 7.2 Further Development of the Proposal

This final proposal presented in this thesis was built to match the case company's current situation and strategy. During the research, further develop possibilities were recognized for the future. The main possibility recognized was adding automation to the process.

The automation would be beneficial for the company as it makes the whole process more straightforward and efficient. It also makes it easier to audit as there is a tool that logs access request and approvals. SAP offers a tool called SAP Cloud Identity Access Governance which includes self-service access-request forms with built-in guides which makes it user-friendly and reduces steps inside the user provision process.

Implementing this tool requires an investment from the case company but in the long run, properly implemented, pays itself back with an increase in efficiency, risk management and auditability.

### 7.3 Thesis Evaluation

The study was conducted within the schedule that was set in the early planning of the project. Multiple possible risk scenarios were taken into account and they were successfully avoided. The data was gathered with the collaboration of the interviewees and other stakeholders.

In the current state analysis, the small sample of interviewees could be a problem for the credibility of the study but considering the long timeframe of observations of the process from both interviewees and the researcher of the study it was acceptable. The CSA helped to focus the research on a few development areas which were identified and became key elements of this study.

As the scope of the project was to create a user authorization process proposal for the case company the thesis can be considered successful. The stakeholders expressed their satisfaction for the project though the implementation of the proposal could result in unexpected inconveniences as implementations can be complex.

### 7.4 Closing Words

During this thesis I was able to further educate myself in the ICT field and to learn new approaches from long line professionals. While conducting the study I got to see how projects are ran in an international company and received valuable experience that will most definitely be useful in the future. It was a pleasure to be part of an environment which was so open to developing their activities. I would like to end by thanking the case company and all the stakeholders who made it possible for me to conduct this study.



## References

AXELOS, 2019. ITIL Foundation - ITIL 4 Edition. 1st ed. London: TSO (The Stationery Office).

Indu, I., Anand, P. and Bhaskar, V., 2018. Identity and access management in cloud environment: Mechanisms and challenges. *Engineering Science and Technology, an International Journal*, 21(4), pp.574-588.

Michael E. D. Koenig, 2018. What is KM? Knowledge Management Explained. [ONLINE] Available at: [https://www.kmworld.com/About/What\\_is\\_Knowledge\\_Management](https://www.kmworld.com/About/What_is_Knowledge_Management) [Accessed 15 March 2021].

David Strom, 2021. What is IAM? Identity and access management explained [ONLINE]. Available at: <https://www.csoonline.com/article/2120384/what-is-iam-identity-and-access-management-explained.html> [Accessed 10 April 2021]

APQC, 2019. What are the Best Four Components of Knowledge Management? [ONLINE] Available at: <https://www.apqc.org/blog/what-are-best-four-components-knowledge-management> [Accessed 15 March 2021]

Cronholm Stefan, Persson Linda, 2016. Best Practice in IT Service Management: Experienced Strengths and Weaknesses of Using ITIL. [ONLINE] Available at: <https://search-proquest-com.ezproxy.metropolia.fi/docview/1779263263/abstract/ED073D143137495BPQ/1?accountid=11363>. [Accessed 20 March 2021].

Cass Information, 2018. 7 Identity and Access Management Best Practices for 2021 [ONLINE] Available at: <https://www.cassinfo.com/cloud-management-blog/7-iam-best-practices> [Accessed 15 March 2021].

SAP PRESS, 2021. User Management for SAP® IBP 1st ed. 2021 [E-book]

