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ANALYSIS AND ENHANCEMENT OF HUMAN CAPITAL MANAGEMENT CLOUD-BASED SOLUTION SAP SUCCESSFACTORS FOR COMPANY PROMINION OÜ

Master´s thesis

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PERSONALIHALDUSE PILVELAHENDUSE SAP SUCCESSFACTORS ANALÜÜS JA TÄIUSTAMINE ETTEVÕTTE PROMINION OÜ NÄITEL

Magistritöö

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Author’s declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature, and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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Abstract

The basis of the master's thesis is a plan of company Prominion OÜ launching into the Estonian market cloud-based human capital management (HCM) solution - SAP SuccessFactors. The main driver for the plan is a hypothesis that, despite the fierce competition, there is always a space for a human resources (HR) software that can not only provide a full employee lifecycle management but can also be customized to perform customers' specific needs. Primarily if it can be implemented quickly and at a reasonable cost.

Thus, the primary goal of the master's thesis is to provide an analysis of SAP SuccessFactors solution modules functionality and to map it with company Prominion OÜ internal needs as well as potential customers' requirements regarding the human resources management, to get a clear overview related to capabilities of the new HCM solution and its perspectives in the local market. Based on the results, to propose a necessary enhancement to the existing SAP SuccessFactors software. The final output of the research is designing the architectural concept of the proposed enhancement and creating its wireframe; in other words, designing its low-fidelity visual representation as well as providing a set of the system future possible enhancements.

This thesis is written in English and is143 pages long, including five chapters, 38 figures, and 12 tables.

Annotatsioon

Personalihalduse pilvelahenduse SAP SuccessFactors analüüs ja täiustamine ettevõtte Prominion OÜ näitel

Mitmesuguste väljakutsete hulgas, millega ettevõtted 21. sajandil silmitsi seisavad, on personalijuhtimisest (HRM) saanud mis tahes organisatsiooni üks peamisi probleeme ja seda hoolimata ettevõtte suurusest, tegevusalast või asukohast. On ilmne, et tänapäevaseid personalihalduse protsesse, nagu näiteks värbamist, sisseelamist, õppimist/koolitusi, tulemusjuhtimist, töötasu ja hüvitise juhtimist, arendamist jms, pole võimalik ilma infotehnoloogia (IT) toeta tõhusalt juhtida. Kuid mitte kõik turul olevad lahendused ei suuda personalijuhtimise üha kiirenevaid nõudmisi rahuldada. Pealegi pole turul ühtegi kasutusvalmis personalijuhtimise lahendust, mis kõiki nõudeid täita suudaks.

Seega on magistritöö aluseks ettevõtte Prominion OÜ plaan tuua Eesti turule personalijuhtimise pilvelahendus - SAP SuccessFactors. Plaani peamine tõukejõud on hüpotees, et hoolimata tihedast konkurentsist on sellise personalijuhtimise tarkvara jaoks alati ruumi, mis ei võimaldaks mitte ainult töötajate elutsükli täielikku juhtimist organisatsioonis, vaid mida oleks võimalik kohandada ka klientide konkreetsete vajaduste rahuldamiseks. Eelkõige siis, kui seda saab kiiresti ja mõistliku hinnaga rakendada.

Seega on magistritöö peamine eesmärk esitada SAP SuccessFactors rakenduste funktsionaalsuse analüüs ja kaardistada see ettevõtte Prominion OÜ sisemiste vajaduste ning potentsiaalsete klientide nõudmistega personalijuhtimise osas, et saada selge ülevaade uue tööjõu haldamise lahenduse võimalustest ja selle perspektiividest kohalikul turul. Samuti on eesmärgiks tulemuste põhjal teha ettepanek olemasoleva SAP SuccessFactors süsteemi täiustamiseks. Uurimuse lõpptulemuseks on väljapakutud täienduse arhitektuurilise kontseptsiooni kavandamine ja selle veebimaketi loomine; teisisõnu vähese täpsusega visuaalse esitluse kujundamine ja süsteemi võimalike edaspidiste täiustuste pakkumine.

Lõputöö on kirjutatud inglise keeles ning sisaldab teksti 143 leheküljel, 5 peatükki, 38 joonist, 12 tabelit.

List of abbreviations and terms

Cloud-based	Hardware and or software hosted in the cloud server by third-party and that is accessible over the Internet
SAP	European multinational software corporation [6]
SAP SuccessFactors	SAP's cloud-based Human Capital Management solution
Provisioning	Back end of the SAP SuccessFactors system
Instance	Front end of the SAP SuccessFactors system
On-premises	Software that is installed and runs on the customer's server
Low-fidelity wireframe	Basic visual representation of future system (static)
Odata	*Open Data Protocol*, which allows the creation and consumption of queryable and interoperable RESTful APIs in a simple and standard way [6]
SOAP	*Simple Object Access Protocol*, is a communication protocol for exchanging specifically defined information [6]
REST	Representational state transfer is architectural style that defines the constraints that need to be taken in account creating Web services [6]
SFAPI	SuccessFactors Data API
GDPR	General Data Protection Regulation, EU data regulation standard
FURPS	*Functionality, Usability, Reliability, Performance, Supportability*
Java	Java is a high-level object-oriented programming language [6]

ABAP	*Advanced Business Application Programming Language* is a high-level programming language initially created and generally used by e German software company SAP SE [6]
XML	*Extensible Markup Language*, simple flexible text format.
J2EE	Computing platform that includes of core Java with a powerful set of libraries [40]
SAML 2.0	*Security Assertion Markup Language 2.0* that enables web-based, cross-domain single sign-on (SSO) [6]
SoD	*Segregation of Duties* is a basic building block of sustainable risk management and internal controls for a business [41]
SSL	*Stands for Secure Sockets Layer*, - standard technology for keeping an Internet connection secure [42]
TLS	*Transport Layer Security*, - more secure version of SSL [42]
SSH	Encrypted and secure communication protocol [43]
SFTP	SFTP stands for *SSH File Transfer Protocol* [43]
HTML5	*Hyper Text Markup Language (5^{th} is the latest version)*
SAPUI5	*SAP User Interface*, used to develop web applications
XSJS	*Server-side JavaScript* that is used to create powerful services in the *SAP HANA* back end [46]
XCA	Certificates generation tool
SAP ASE	*SAP Adaptive Server Enterprise*, relational database server.
SAP HANA	The Business Database, is an in-memory, column-oriented, relational database management system [6]
UX	*User Experience*
IoT	*Internet of Things*
IaaS	*Infrastructure-as-a-Service*

DevOps	An approach that combines *software development (Dev)* and *information technology operations (Ops)*
SAP Web IDE	IT is a powerful, extensible, web-based tool that simplifies the development of end-to-end SAP Fiori apps and the full-stack application lifecycle [48].

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Introduction

Today we live in a constantly changing world, and the rate of changes is increasing rapidly. This affects particularly large corporations with many branches around the globe; however, more and more medium, and even small businesses (SMB) face the same challenges nowadays. Thereby, each organization that attempts to maintain its competitive advantage, both today and tomorrow, is obligated to foresee future patterns of consumer behavior and predict changes in the economic environment; likewise, be able to develop effective management and monitor the performance of business key processes. Depending on the market and industry company operates in, the management of the organization needs to be familiar with local regulation and compliance, as well as be able to deal with ever-accelerating technological innovation and an increasing amount of data. [1] Moreover, every single organization requires highly qualified human resources fully equipped with the latest practices and technologies to get business genuinely ready for changes and upcoming challenges of the new millennium [2].

Thus, there are lots of challenges organizations face nowadays, but evidently, the most crucial concern to any organization is their human resource management. Here is how Zorlu Senyucel sees the importance of people in any organization: "Organizations depend on people. We can even be more direct and say, there can be no organizations without people. Organizations do what people do. An organization behaves the way its employees behave, the way its managers direct it. What is an organization if there are no people in it? It is just a collection of building, car parks and some furniture" [3, p 9]. Indeed, people are the most valuable asset of any organization, and there should be a strategy and obviously, an information technology to manage this limited asset most efficiently.

The use of technologies has become one of the integral practices for most 21st-century companies, and human resources management is not an exception. For instance, cloud-based Human Resources Management (Cloud-based HRM), e-Human Resources Management (*e*-HRM), or Web-based Human Resources Management (Web-based HRM) references are familiar to many HR professionals, and even ordinary employees;

moreover, many of them use these new systems daily. [4]. Following the relevant trend, and using it as a rationale for decision-making, company Prominion OÜ has decided to bring the cloud-based human capital management software called SAP SuccessFactors (SAP SFSF) solution into the Estonian market. Firstly, to cover the organization's internal needs and to get more experience implementing different modules of the SAP SuccessFactors software. Furthermore, by analyzing customers' requirements to launch adapted to local realities SAP SuccessFactors solution into the Estonian market.

The primary goal of the master's thesis is to analyze the core modules of the SAP SuccessFactors applications and then map it with company Prominion OÜ internal needs as well as potential customers' requirements regarding the human resources management to get a comprehensive picture of the new human resources management system (HRIS) capabilities and its perspectives in the local market. Based on that, to propose a vision of enhancement for the SAP SuccessFactors solution, to create its necessary architectural structure, and to provide the wireframe (a low-fidelity visual representation) of system enhancement as well as to set a list of the system future additional functionalities and features.

The master's thesis consists of five chapters. In the first chapter of the current master`s thesis, the author describes the problem he going to solve throughout the whole journey as well as justifies the relevance of the described problem and finally, formulates the primary goal of the master's thesis.

In the second chapter the author focusing on the analysis of cloud-based human capital management solution that needs to be adapted before launching it into the local market.

In the third chapter the author goes deeper into the market and economic as well as technical details to make sure that there is a rational foundation for the planned system enhancement project.

During the fourth chapter, the author describes possible design methodologies and after considering several design approaches defines the method based on which further system enhancement design will be undertaken in the final chapter.

The fifth chapter's final output is an architectural and a visual representation of the proposed enhancement for existing SAP SuccessFactors solution as well as its further development plan.

1 Description of the Problem

Today there are various challenges across human resources; that includes increasing globalization, the continual evolution of technology, hyper-competition, companies mergers and acquisition, and often associated with these processes organizational restructuring, managing the different generations and nationalities in the workplace, etc. Moreover, after hiring new talent for a job position, human resources management (usually HR manager in the organizational hierarchy) is also in charge of employee training, performance and motivation, development, succession, and retention. [2, p 217]. All this variety of changes and challenges human resource management responsible for cannot be efficiently handled without a powerful IT tool supporting these processes.

Despite that, the use of information technology has become a crucial practice of the entire organization in general and human resource management in particular, during the recent years, there are still concerns regarding the efficiency of e-HRM systems for businesses. There is none of the ready-made e-HRM solutions, that can meet all the possible problems related to human resource management Moreover, some researches have pointed several limitations of current e-HRM systems; for instance, a lack of functionality for interpersonal communication or a set of artificial barriers in the system between employees and organizations [5]. Besides that, there are some more concerns, including significant initial investment, possible hidden costs, the complexity of the change management processes in an organization before, during, and after the system implementation period [4].

In such conditions, launching a new product into the market should be a well-grounded and thoughtfully considered. Thus, the prerequisites for the step of launching SAP SuccessFactors solution into the local market is mapping of potential customers' requirements and enhancing the system according to these demands. Besides that, if necessary and appropriate, then a customized approach needs to be offered as well. The real reason for that is not only to win the market's share in general and customers in particular but to deliver an outstanding customer experience, thereby to build a long-term and mutually beneficial relationship with a customer. This strategy is particularly relevant in the case of the SaaS cloud service model that SAP SuccessFactors software is, as

according to this model, a customer (theoretically) can cancel the subscription at any time, unlike in case of on-premises software.

1.1 The Primary Goal of the Current Thesis

Thus, the main output of the current master's thesis is designing an architectural concept of necessary enhancement for the SAP SuccessFactors solution based on local market business requirements and company Prominion OÜ internal needs. Moreover, creating the wireframe (a low-fidelity visual representation) of existing HRIS proposed enhancement and providing a set of the HR system future possible functionalities and features. To do that, there a few prerequisite steps that need to be done, including:

- Analyzing the functionality of the SAP SuccessFactors solution modules.
- Familiarizing yourself with other IT based solutions currently available in the Estonian market.
- Collecting potential clients' requirements and issues related to human resources management that might be not covered yet, or their implementation or performance weren't good enough. In other words, there should be identified as a potential demand to ensure that the improved SAP SuccessFactors software is ready to be launched into the marketplace.
- Checking the ability of organization Prominion OÜ regarding the team skills and financial and time resources to handle such complex projects of development, integration, and the HRIS configuration as needed.

1.2 The Relevance of the Problem

The significance of the problem from the potential customers' (the local market) perspectives is based on the fact that each of the local players' e-HRM tools can solve one or a few challenges today. And so far, there were none of the e-HRM solutions that can meet all the human resource management requirements businesses face nowadays. There can be a space in the market for a solution that provides a seamless, cost-efficient human resource management solution. Thus, the analysis of the SAP SuccessFactors applications later in this thesis will show the ability of the solution to become such e-HRM or not.

Additionally, the author of the current thesis will try to propose the possible core HR system enhancement to make SAP SuccessFactors solution more engaging for customers.

From the company perspectives, the relevance of the problem is also apparent. Specifically, taking into account the plan of company Prominion OÜ to launch the SAP SuccessFactors solution into the marketplace (looking ahead) during the second half of the present year. It is obvious, that the outcome that was described above will be the signal for the company's management to continue or stop the financing project of launching SAP SuccessFactors software into the local market.

The problem described above is also relevant for the author of the master's thesis as according to his job position in the company (he is responsible for the implementation and configuration of SAP SuccessFactors software several modules) his further career in the company depends a lot on the result of the analysis described throughout the master's thesis. However, the author certifies that he will provide an objective assessment of made SAP SuccessFactors solution functionality analysis and its possible enhancement described in the final chapter, which is based on real facts rather than the author's desire to keep the job.

1.3 Chapter 1 Summary

The realities of the modern world demand a new approach for the management of a business in general and human resources in particular. The use of information technology has become a vital practice for any organization despite the size, industry, or market in which the company acts. However, it not always easy to find a ready-made solution that can meet all possible requirements related to organization-specific needs, and human resource management is not an exception. In these conditions, the company Prominion OÜ has decided to bring the cloud-based SAP SuccessFactors solution into the Estonian market. To ensure that there will be a demand for it, the decision was made to analyze the local potential clients' requirements as well as organization internal needs regarding the human resources management and based on that to propose an enhancement for SAP SuccessFactors solution to meet the local market demands and as a result, to successfully launch the new HCM solution into the Estonia market.

2 SAP SuccessFactors Introduction

Considering the SAP SuccessFactors solution, first, it is necessary to have a look at the definitions and descriptions provided by different sources. According to Wikipedia: “SAP SuccessFactors is a cloud-based software for human capital management using the Software-as-a-service (SaaS) model” [6, SuccessFactors]. Based on information from open SAP portal, the SAP SuccessFactors Human Capital Management solution that integrates onboarding, social business, and collaboration tools, learning management system (LMS), performance management, recruiting software, applicant tracking software, succession planning, talent management, and HR analytics applications. SAP Success Factors solution uses the SaaS business model, easy to implement, able to grow with an organization; in other words, the solution allows to start from a particular module and then expand the success by adding new modules as needed [7]. Currently, the services translated into 41 languages and has more than 6,400 customers, with over 100 million users in 60 industries in over 100 countries. [6]. Next, the author of the current master’s thesis describes SAP SFSF application architecture, as well as provides main modules overview in a general and detailed overview of SAP SuccessFactors solution core module - Employee Central (EC) in particular.

2.1 SuccessFactors Technical Aspects and Application Architecture

To better understand the architectural concept and potential issues of SAP SuccessFactors solution, it is important to be familiar with the historical reference of SuccessFactors organization too. Even though SuccessFactors was founded in 2001 as an American multinational company, on December 3, 2011, it was acquired by SAP AG. Over time, the SAP SuccessFactors software has been upgraded a lot, and this process continues with regular releases twice a year [6]. However, the technical aspects of the SAP SuccessFactors system remain unchanged; firstly, the core application generally builds in *Java* and uses the *J2EE* specifications. Secondly, each page the end-user is accessed is dynamically created and encrypted with the help of *SSL* technology. Besides this, each request in the application is an independent transaction and is not related to the previous

request; it helps to minimize the amount of memory needed and ensure excellent performance for the cloud-based system [11].

Considering the SAP SuccessFactors software architecture is critical to note that the core HRIS cannot be changed or enhanced even with a built-in programming language such as *ABAP*. However, the behavior of the system can be managed by configuring through the *XML* data models. The SAP SuccessFactors solution is a multi-tenancy platform meaning that there is a single instance of the application with a single database instance using for all vendors at the same time. [11] The SAP SuccessFactors software architecture is represented in the figure below.

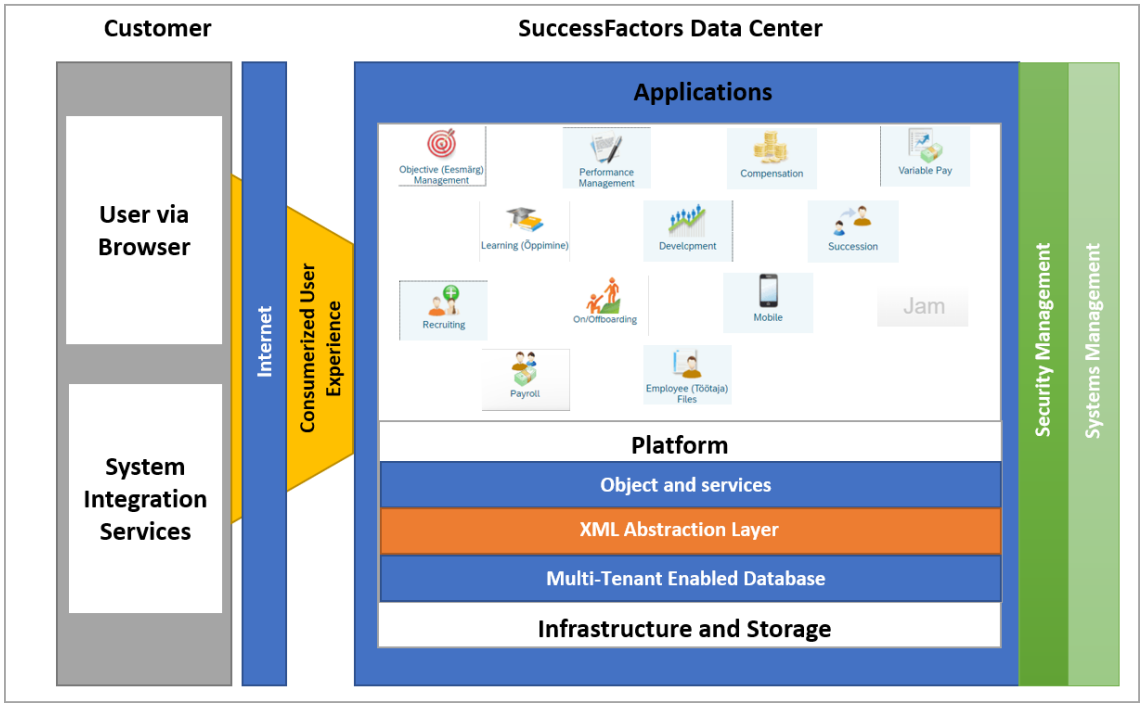


Figure 1 - SAP SuccessFactors software architecture [11].

As a result, this approach has its pros and cons. On the one hand, using SaaS cloud-based solutions such as SAP SuccessFactors software has the following benefits, including regular releases, latest version availability, and debugging by a service provider. Likewise, cost savings for hardware and IT infrastructure licenses and management, a guarantee of persistent performance and more excellent stability, more efficient support and maintenance, data aggregation, and its analyzing. On the other hand, multi-tenant architecture means that if the instance is down, then all vendors are in trouble. Similarly, the fact that changes to the SAP SuccessFactors system core code simply not possible

might become a barrier for some organizations to start using a particular cloud-based HCM solution [11].

2.2 SAP SuccessFactors HCM Security Overview

One of the most important questions for organizations considering cloud-based solutions is security. Many customers still have prejudice to this day that the software-as-a-service model is not safe enough. Taking it into account it is essential to emphasize that SAP SuccessFactors solution has various security standards, methods, and in-house expertise that ensures the certain security level of customers' data. Furthermore, in the contest of data ownership, the SAP SuccessFactors is a data processor, not its owner. The customer always keeps ownership of the data, and can at any time, download (CSV format) the data from the system. SAP SuccessFactors has various security mechanisms, such as a physical site, a database, middleware, an application, and network and communication channels. Beside of that, SAP SuccessFactors has several data centers around the globe, each of those data centers not only performs services but also operates as disaster recovery for each other. All data centers are highly reliable, and all the necessary security procedures are in place, including network access protection, server protection, as well as a variety of latest antivirus, anti-hacking, malware detection software, etc. that run 24/7 [11].

On the database layer, SAP SuccessFactors has several protections for activity tracking and blocking, and data change logging and auditing on its databases. Moreover, stored data is encrypted and backed up on a nightly and weekly basis. The middleware layer of SAP Success Factors is the platform that has various authentication security processes that include single sign-on *(*SSO*),* federated identity management, *SAML 2.0* assertion, and *SoD* (segregation of duties). The modules in SAP SuccessFactors include the application layer with a build-in role-based permissions (RBP) concept as a core security system in it. The network and communications layer use well-known standards for transmission data, including VeriSign-certified *SSL/TLS*, *SFTP*, and *SSH* [11]. Further justification for the RBP mechanism will be provided in section 2.8.4. As a next step, let have a closer look at SAP SuccessFactors applications and the relationship between them.

2.3 SAP SuccessFactors HCM a Closer Look

Among the main SAP SuccessFactors solution modules there four primary groups of applications can be pointed out including core HR (SAP SuccessFactors Employee Central & SAP SuccessFactors Employee Central Payroll), Talent Solutions (SAP SuccessFactors Recruiting, SAP SuccessFactors Onboarding, SAP SuccessFactors Learning, SAP SuccessFactors Performance & Goals, SAP SuccessFactors Succession & Development, SAP SuccessFactors Compensation), Analytics (SAP SuccessFactors Workforce Analytics, SAP SuccessFactors Workforce Planning) and finally, Mobile (SAP SuccessFactors Mobile App), and Social (SAP Jam Collaboration platform). As a result, all these four groups are combined in the SAP SuccessFactors HCM product family called SAP SuccessFactors HCM Suite [8]. The SAP SuccessFactors applications are represented in the figure below (development instance).

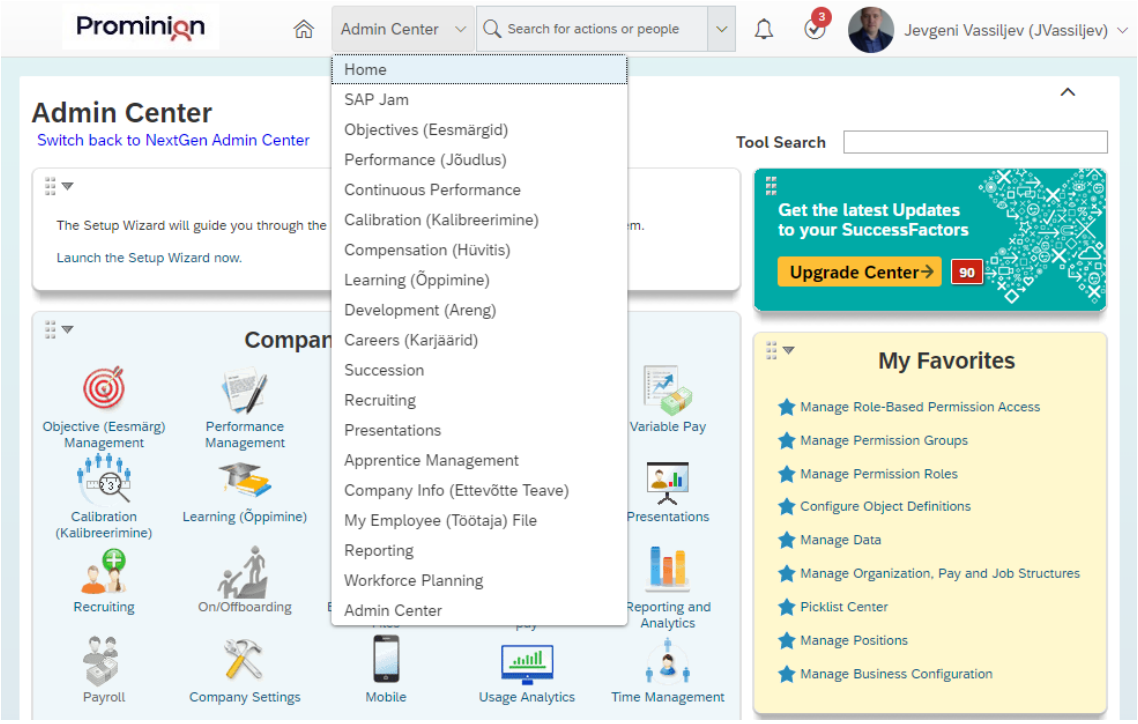


Figure 2 - Admin Center Page, (created by the author).

It is necessary to mention that the SAP SuccessFactors HCM suite consisting of an independent module that can be used as autonomous applications; nevertheless, according to the recommendation of SAP best practices the core module - Employee Central can be implemented first. Indeed, Employee Central provides extensive, synchronized, and searchable information about the organization and employees. The data stored in the EC can be accessed by other SAP SuccessFactors solution modules and external systems.

Employee Central keeps data regarding the company's organization, pay, job structure, and employees; similarly, it allows to store history, create associations, use effective-dated objects, configure automated workflows, etc. [9]. The relationship between SuccessFactors modules represented in Appendix 1. It's time to look at each module separately, starting from this point.

2.4 SAP SuccessFactors HCM Core HR Briefly

SAP SuccessFactors Employee Central is the core module of the HRIS that primarily helps organizations manage their employees. Moreover, it allows organizations to engage their entire human resources, including employees as well as managers and HR managers. The application is created to be focused on the end-user, helping organizations to provide their staff with a complete picture of an organization and its employees' structure. Using a self-service feature, the employees and managers can make minor changes to the Employee File, avoiding a formal approval process.

However, lots of data change transactions demand an approval workflow, and EC provides such functionality by default. The Employee File page is the core of the HRIS*;* depending on the configuration, it contains different blocks of organizational and employees' information, primarily including a). General information, such as User Info, Notes, Badges, Org Chart, etc. b). Personal information including Biographical Information, Personal Details, Contacts & Addresses, Emergency Contacts & Dependents, National ID & Personal Documents, etc. c). Employment information - Employment Details, Job Information, Job Relationship, Organizational Information, Time Off, etc. [12, pp. 47-48, 51]. The Employee File example is displayed in Attachment 2 (development instance).

Employee File is searchable and can be found by anyone in an organization who has the appropriate role-based permissions. Besides that, the organizational and employee data can be edited or even be transferred over time; moreover, the system stores a history for all transactions over time using effective and non-effective dating. Employee Central transaction records are based on events that cannot be modified. However, there are event reasons in the system that provide additional context to events and are customizable at the same time. The Approval Workflow and Business Rules allow an organization to configure approval workflow and define which transaction triggers workflows. The main

idea of workflows is to ensure that every party involved in the transaction is informed (notification via e-mail) that a change is going to take place [12, pp. 49-50, 52].

Employee Central has a variety of additional features of managing employees, including a). Time Off that allows employees and managers to request different types of leave (i.e., vacation, sick leave, maternity leave, business trip, etc.) via a native calendar view. b). Position Management allows organizations to manage and track positions to meet their requirements. c). Benefits enable employees to initiate and manage their benefits. d). Document Generation enables to generate any type of documents need to be presented or sent to employees. e). Data Imports allow a user to set up data updating processes to automatic mode [12, p. 53]. More details regarding the technical aspects of the Employee Central module can be found in subchapter 2.8 of the current master's thesis.

Based on purchased modules and application configuration, some other informational portlets can also be activated, such as Career, Talent Profile, Employee Central Payroll, SAP Jam, etc. SAP SuccessFactors Employee Central Payroll is an optional component of Employee Central, and as the Employee Central Payroll is not supporting Estonian payroll processes so far, an overview of this module will not be considering in the scope of the current master's thesis. One of the SAP SuccessFactors Employee Central feature – Time Off is represented in the figure below (development instance).

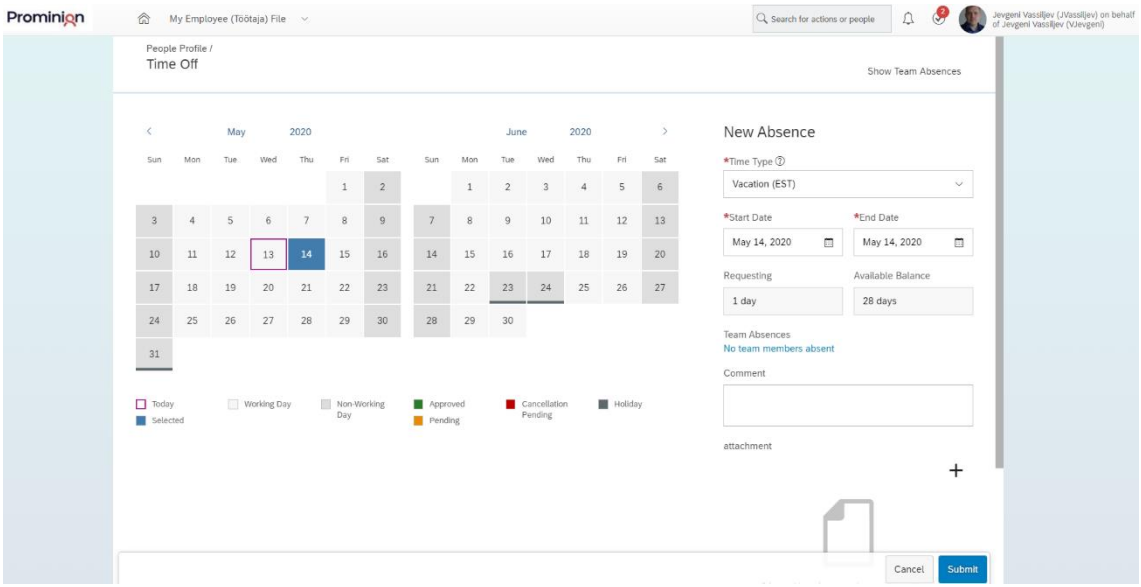


Figure 3 - Time Off feature, (created by the author).

2.5 SAP SuccessFactors HCM Talent Modules

SAP SuccessFactors Talent solution includes Performance and Goals (PMGM), Recruiting, Onboarding, Compensation, Learning, and Succession and Development - provide comprehensive talent management that is integrated with other SAP SFSF HCM applications. It is essential to emphasize that all modules of SAP SuccessFactors solution are synchronized to each other However, initially many of the applications were independent systems, and have belonged to several companies acquired by SAP SE over time. Therefore, some of these applications have a different architectural structure, various security approaches, and processes logic. So, as was mentioned above, all modules are synchronized and can also be integrated with third-parties' systems. Moreover, with each new release, an architectural difference between applications disappears, and it is evident that in the next few years, formerly independent applications will become a comprehensive HCM solution. Now let us have a look at SAP SuccessFactors Talent Solution applications in detail.

2.5.1 SAP SuccessFactors HCM Performance and Goals

Goal Management enables employees and managers to set up and track their goals both on a personal level and on an organizational basis. There are various types of goal plan forms available in the PMGM application, such as Public Goal, Private Goal, Group Goal, and Team Goal, that can be chosen based on the user's role (RBP) and purpose. Moreover, goals can be categorized using standard goal plans or custom created, depending on an organization's specific requirements. Furthermore, there is a goal library available in the system. Depending on the user permissions (RBP) and business processes, the goal can be selected from the library and added into a goal plan; after that, the objective can be modified when it attached to a plan [12, pp. 92-94]. The goal plan example is displayed in Appendix 3 (development instance).

Describing the PMGM module, it's almost impossible not to note that the application consists of various useful features that help to engage organization employees in a goal-setting activity more efficiently. Among them are a). Initiative Management – the tool that enables admins to create corporate, departmental, or division level initiatives and then allows employees to link their personnel objectives to created organizational initiatives to collaborate as one single structure. b). Cascading and Linking Goals feature will enable users to cascade and associate goals both, between related or interdependent

objectives or across the users, depending on their place in the organizational hierarchy, role-based permissions, and business process [12, p. 95].

Performance management helps managers and employees to track employees' goals and competencies. It links the goals of the company with metrics, skills, competency requirements, and development plans agreed with employees. This ensures the delivery of results through the automation of talent management processes. A Performance Form contains various slots of data in different areas of the form, including a). The introduction is an intro text that provides information to the user about the purpose of the review. b). Competency is a list of competencies that been defined by the organization. c). Development Goal is the objectives of the employee's development plan. d). Summary displays overall information regarding evaluation on the form. e). Signature is a list of individuals whose signature was requested [12, pp. 96-100].

Employee's performance management is a dynamic process that can be evaluated through the 5-points Rating Scale and tracked via Route Maps stages' completion. There is a Team Overview features in the application that enables managers to get a full overview of their employees' performance. [12, p. 100].

PMGM offers a lot of additional features, including a). Continuous Performance Management (CPM) that enables employees and managers to record their activities and achievements, and through the structured and ongoing one-on-one meetings provide activity review throughout the year. b). Calibration helps to avoid any potential manager prejudgment; in other words, it allows managers to create and apply for all employees a unified system of performance evaluation. c). The workflow of 360 Reviews will enable users to ask/get feedback from different sources. These reviews can be used by managers to identify blind spots and hidden strengths of employees to direct their development. [12, pp. 101-107]. One of the SAP SuccessFactors Performance and Goals features – Continuous Performance Management is represented in the figure below, (development instance).

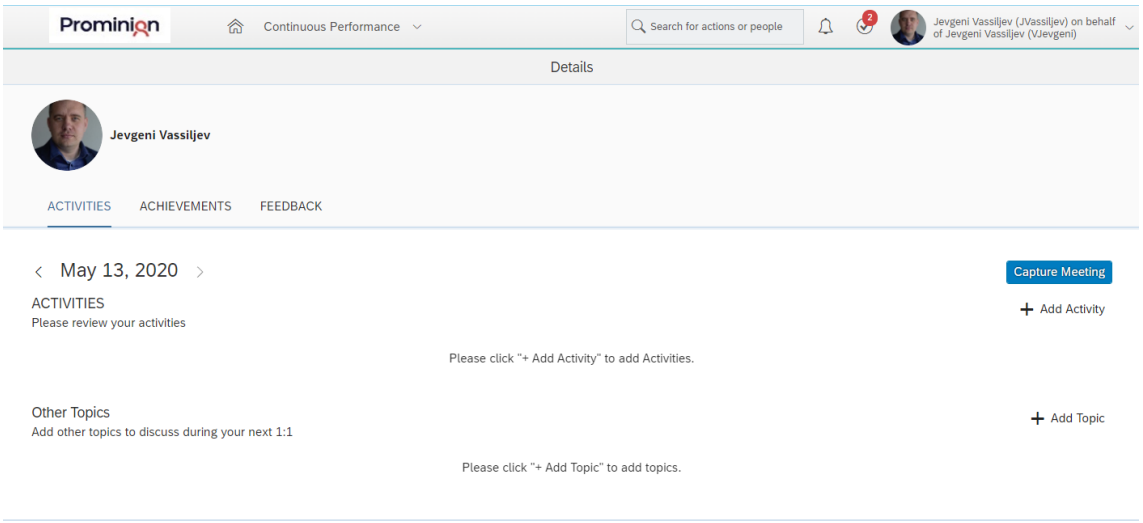


Figure 4 - Continuous Performance Management, (created by the author).

2.5.2 SAP SuccessFactors Career Development Planning and Mentoring

Career Development Planning attracts employees to be more engaged in working on their career objectives, competencies, eventual roles, career roadmap, or mentoring. SAP SFSF CDP allows managers or HRs to help with the fulfillment of an employee's ambitions. It includes a Development Plan, Career Worksheet, Career Path, and Mentoring. The Development Plan is the page where Employees and Managers can work on their development goals, not only become better in their current roles but get prepared for future challenges too. Development Goals consist of different fields such as Name, Measure of success, Status, Start due date, Competencies. There can be a single or set of learning activities linked with Development objectives. These activities can come from a catalog or may also be added by the user. If the system is integrated with the learning management system, then learning content can be delivered directly to the necessary learning source in the learning application. Career Worksheet enables employees to define a future role and, depending on those, compare requirements for the next position with competencies they already have. Beside of that, development goals along with learning activities can be added, edited, or removed right from the Career Worksheet, and will be automatically updated on the Development Plan. The automatic process for evaluation of the candidate's readiness for a new role is also provided in the system. The Career Path allows admins or HR managers to make up a career pipeline for a position or multi-positions. Employees simply follow the Career Path using it as a visualization tool throughout the self-developing process [12, pp. 81-84]. Besides that, there are various features available in the system, including links that help to open a role's career path

directly from Career Worksheet, or an asterisk flags that the role is already selected in the career worksheet.

Mentoring: according to Wikipedia: "Mentorship is a relationship in which a more experienced or more knowledgeable person helps to guide a less experienced or less knowledgeable person." [6, Mentorship]. Quite often, the transmission of crucial information experience takes place through personal communication or working in small groups using the latest technologies. The Career Development Planning allows to manage mentoring activities, as well as select mentor and mentee groups; likewise, schedule timelines for individual training courses. There is an algorithm that helps to link a mentor and a mentee based on answers from the sing-up form. Among the program options, three mains can be highlighted, such as a). Supervised: According to this manual approach, the Mentor and Mentee assign by admin, and the schedules for this type of seances are strictly determined. b). Unsupervised: Similarly, the Mentor and Mentee assemble by admin, but in this case, Mentee invites Mentor independently without Admins' help. c). Open Enrollment allows users to become a mentor or Mentee equally. This flexible approach provides self-registration on any available dates, and for all subjects of organization, available to all individuals. As soon as session type is defined, admins will be able to determine the details of mentoring programs (program name, description, work out the criteria of the sign-up form, etc.) [12, pp. 85-86]. The development plan example is displayed in Appendix 4 (demo instance).

2.5.3 SAP SuccessFactors Learning Management System

The Learning management system is built to provide users web-based training possibilities. The entering point of the LMS is a To-Do list in the users' SAP SuccessFactors system. Their To-Do list will display the top 5 items that need to be done in the nearest future; indeed, the link that will navigate the user to their learning page will be provided as well. There are two options to access SAP SuccessFactors Learning, to go to the provided link in the To-Do list or to use the Home drop-down menu and select a needed source. At the moment when a user accesses the Learning Home Page, the News Page pop-up may occur (optionally) on the screen. It can be used to provide users any important notes or information. The LMS user home page consists of between 1 and 5 configurable landing pages with customizable tiles, including a). My Learning Assignments that display items (such as training course, pdf file, e-book, etc.), curricula,

requirements, surveys, and programs assigned to the specific user. b). My Curricula: It displays the (graphically) status of an item. c). Learning History allows seeing the last 30 days of learning activities records. d). Find Learning enables users to search and overview catalog (provides access to items). e) Featured are the items that are defined as New or Featured. There are also additional tiles LMS Home Page may include a). Links that can be created by the admins and provide quick and easy connection to internal and external sources like My Quick Guides, Collections, Reports, Record Learning, Approvals, etc. b). My employees: This is a tracking feature that allows supervisors to see a pie-chart status of all learners. c). Group of tiles to help the user to track his or her learning items easily and access them rapidly if needed, including Recommendation, Available Scheduled Offerings, Self-Assigned, Bookmarks. d). Custom Tile allows administrators to configure tile with a rich text editor or *HTML* to reach user-specific needs [12, pp. 62, 64-65].

Since there are a variety of roles in the system, different user interfaces can be distinguished accordingly. Supervisor Interface: The key activities can be noted, including browsing assigned items and their status, as well as overdue courses of their employees, based on supervisor permission. Likewise, registering items and curricular, assigning users into available planned offerings, recording of completions for participants. Beside of that, creating reports for subordinates, delegating responsibilities including reassigning supervisors for the trainees, manage confirmations. Instructor Interface depending on their permissions, allows instructors to take the following actions: browsing planned courses and printing the list if needed, viewing participants who have been assigned for the training, recording of completions for the learning program. Likewise, creating time breaks during class time, monitoring attendance by group or segment, initiating a survey for some or all participants, communicating with the user via e-mails. Admin interface depending on the access allows admins to make learning course assignments, schedule courses, monitor course participants and track how many users have completed the training requirements. There are four major sections of the admin page, including a). Top menu frame: It enables admins to configure and maintain core elements like Users, Learning, Content, etc. b). The left menu frame consists of Sub Menus related to the Top Menu Frame. c). Content Frame Content Frame is where appears admin content he or she is currently working on. d). Bookmarks and Resents Panel display records viewed recently. [12, pp. 66-68].

Considering assigning of the item, there four main scenarios can be mentioned, among them a). User Records: the basis of this method is that a training course is added to the Learning Plan of the user by admin, and this is called a free-floating item. b). User Needs Management is a manual assignment of one or multiple items, curricula, or programs to a group of people. c). Job Codes (Legacy Method) is an approach in which curricula associate with job codes, in other words, when an employee is assigned a job code, an item can be automatically enrolled to the employee. d). Assignment Profiles is the most advanced dynamic approach to assign and unassign items, curricula, programs, groups, or a role to the user. Using this method, admins can define rules for triggering specific items, curricula, or plans for certain groups or roles of users. Competencies such as skills, abilities, knowledge, or behaviors are the values that are used to associate items to competencies. This approach allows users to search for courses by required competency and enroll in their development plan. The competencies may be created or imported from the library in SAP SuccessFactors. The data migration can be done with the built-in connector. Commerce that enables to track the cost of delivering training, as well as costs for the user, participates in [12, pp. 69, 74].

As SAP SuccessFactors Learning Management System initially was an independent application that is synchronized (definition of internal integration between SAP SuccessFactors applications) with the rest of the SAP SFSF HCM solution. The LMS security layer has a separate architectural structure based on Domains, Workflows, and Roles, not Role-Based Permissions as in the SAP SFSF system. Finally, LMS provides a feature called [12, pp. 70-73].

2.5.4 SAP SuccessFactors Onboarding

The SAP SuccessFactors Onboarding application ensures retention, engagement, and productivity of every single stage of the employee life circle inside of an organization, starting from the moment of entering the company to the moment of moving on outside of the organization. The SAP SFSF Onboarding consists of three major components, such as a). People: This allows a user to link new hires with the right people inside of the organization and relevant information before the first day at work. b). Process: consists of components like a new hire, recruiter, HR, IT, etc. via key onboarding processes. c). Productivity: hiring new employees quickly, shortening their adaptation period [12, p.

36]. Onboarding Dashboard 2.0 and 1.0 versions are displayed in Appendix 5 and Appendix 6 (demo instance).

The process of hiring a new employee includes the completion and signing of a variety of online forms. The Onboarding Process itself consists of the following steps: a). Post-Hire Verification is the process of filling out of web-form data fields that initiate after starting of the Onboarding process. Its primary output is verification and updating of applicant job data, including his or her name, start and orientation dates, social security number (SSN), job position, location, and salary amount. b). New Employee Step is the next stage of the Onboarding process, allowing the new employee to provide information that wasn't collected during the applicant phase. The employee receives access to the sources through the Welcome e-mail. Orientation Step is for the US only, and an overview of this feature won't be taking in the scope of the current master's thesis. [12, p. 37].

The critical components of the Onboarding module consist of a). The Onboarding Dashboard is the home page of the SAP SuccessFactors Onboarding module that provides real-time information regarding new hires as soon as the onboarding process initiates. The intuitive design of the Onboarding Dashboard new user interface allows the users to quickly access needed data that helps to complete required hiring processes rapidly. b). All procedures used in onboarding are built with wizards that will direct the user throughout each stage. All unique data collected in each wizard with the help of smart data entry panels will be used to fulfill the forms and create required files for back-office applications, including payroll, time, and attendance, and HRIS. Moreover, most of the data going to be collected in these panels may be pre-fulfilled if fields are integrated with one of the applications, Applicant Tracking System, or HRIS. c). Forms: the data collected in entry panels are used to generate PDF forms that will be displayed later for overviewing, signing, and printing if necessary. d). Notifications are automatically occurring at specific steps of the process to internal and external resources for provisioning, facility services, badge creation, etc. Notifications can be sent in two different formats, in the form of e-mail or like a work queue activity. e). SAP SuccessFactors Onboarding supports a few ways to sign the PDF forms generated in the system, including e-signature click technology and DocuSign eSignature technology, but the second one requires third party integration with DocuSign. The benefit of DocuSign is that it can be used for signing documents on mobile devices. In case a form requires a

wet signature, the PDF form will be presented for printing and the following signing [12, pp. 38-42].

There are additional features in the Onboarding application such as Paperwork, Message From My Manager, People to Meet, My Peers (My Team title for new hires), Where to Go, Prepare for Day One, Meetings, Useful Links, To-Do Tile, Links, My Info, Jam (collaboration tool) which won't be considered in detail in the current master's thesis.

2.5.5 SAP SuccessFactors Recruiting

The SAP SFSF Recruiting can be divided into two major categories, including Recruiting Management (RCM) and Recruiting Marketing (*RMK*). SAP SuccessFactors *RCM* provides a multi-channel approach that links new job openings with a suitable job seeker. The recruiting operation is taking place through the Job Requisitions Page, which contains a comprehensive overview of potential candidates and hiring processes, including a). Job Requisition is a hiring request that triggers the recruiting and hiring activities. b). Job Posting allows posting a requisition both to the internal and or external job sources. c). Career Site allows seekers to search for new requisition and apply for the job position, as soon as requisition has been posted,). d). Candidate Profile is a page where a potential candidate's data stored. e). Candidate Application page provides data that has been saved by the recruiter during the candidates' profile viewing session. f). Candidate Selection Management is a process where a recruiter moves the candidate through the process, changing applicant status at the end of each recruiting stage. g). Talent Pipeline is a tool that helps to visualize and filter the applicants by selected status. h). Set-Up Interview page where a recruiter can create the list of interviewers who will participate in the applicants' interviewing process. i). Interview Central - an interview evaluation forms pick competencies from the applicant requisition and enables the interviewer to provide evaluation and comment on each competency. j). Offer Management is a process that allows a recruiter to send offer approval and offer letter to the selected candidate [12, pp. 18-26].

Among the additional functionalities Recruiting Management provides the Job Requisition Route Maps feature that allows defining the approval pipeline for a new requisition. Job Requisition Templates and Question Library are the features that enable a recruiter to start the process of requisition creation straight away; however, questions can be entered manually too. Recruiting Posting helps recruiters in posting new job

positions to the correct job portal [12, pp. 27-29]. Job Requisitions Page example is displayed in Appendix7 (demo instance).

SAP SuccessFactors Recruiting Marketing (RMK) is the approach that customizes the process of searching and applying for a job by an applicant; in other words, this is the SAP SFSF system that defines what applicants see during the new job positions search. Career Site Builder (*CSB*) is an SAP SFSF Recruiting Marketing career website that provides the approach written above, and it can be configured by independently by a customer with a little SAP Support or any third-party provider or services. Career Site Builder includes various pages with standard and customized components as well as advanced features, including a). The Talent Community allows engaging potential career website visitors who haven't applied for a job in the first place. b). Job Alerts - a feature that captures job seekers searching history, and when a candidate joins the Talent community, job alerts will appear on the page related to the type of job position he or she was interested in. Besides that, the Recruiting Marketing Advanced Analytics summarized the data from both sources, RCM and RMK, to enable recruiters to overview the whole path starting from candidate's first visit to their possible hiring. Candidate Relationship Management (CRM) features are available to all clients using systems that have Recruiting Management integrated with Recruiting Marketing. CRM functionality consists of a). Landing Pages: External recruiting sources use the landing page as a starting point for an applicant to find and apply for an open position. b). Talent Pools are the ways of grouping candidates to facilitate their search in the future by using specific categories such as job fairs, skill level, certification, etc. c). E-mail Campaigns are an option for communication with those candidates who, for some reason, haven't applied in the first place. d). Correspondence allows communicating with candidates in one-to-one format through the e-mail. e). Candidate Profile and Candidate Search is a process where the hiring manager can use records of the candidate's data for the search of candidates in plenty of ways. [12, pp. 13-17].

2.5.6 SAP SuccessFactors Compensation

The Compensation application provides management with most of the information needed for planning decisions on employees' final salary, promotions, adjustments, equity, and stock management regarding individual, group, or organization in general. The compensation module is integrated with Performance Management that logically

associates job performance with employees' rewards. The merit increases depending on a calculation that can be implemented using various elements such as job level pay grade, performance rating, compa-ratio, and range penetration. The Compensation application is built up from the variety of compensation templates, and each of these is responsible for a specific compensation process; furthermore, the template consists of various components required for compensation planning, including a.). Budget: Depending on the complexity of the budgeting procedure, companies can determine the financial plan for each compensation element or use a more formal budget process. The budget will be displayed on the appropriate worksheet afterward. b). Guidelines provide budget planners with the rules and limits that need to be observed during the financial planning, specifically, allows to follow the formula on how much of an increase to provide to employees based on specific criteria, such as performance, job level, budget group, etc. c). Eligibility defines which groups are eligible for increases of different elements, including merit raise, salary increase, etc. d). Component Level where an eligible (ineligible) individuals can be included (excluded) from the worksheet depending on their role and rules have been set in the organization. e). Field Level where rules can be applied to the particular elements, such as promo, merit, lump-sum, stock, etc. In other words, if a user is ineligible for the field (s), the field will become inactive, and the budget planner won't be able to edit it. These templates use afterward to generate compensation planning forms. After a form been created, it will be assigned to the manager responsible for the planning of compensation for a certain group of employees. The Compensation Planning *UI* displayed information is configurable and may also be determined during the configuration stage. [12, pp. 121-122, 125]. Annual Salary, Equity & Incentive Plan form is displayed in Appendix 8 (demo instance).

The Compensation Process consists of two main elements, including Route Maps and Executive Review. A route map defines the scenario a compensation worksheet will follow. As soon as recommendations are added, the form is transmitted through an approval process between planner (s) and approver (s). Executive Review allows appropriate managers to track compensation recommendations across their areas of responsibility, in case of deficiencies, make necessary corrections. One of the Compensation module features is Spot Awards that combines events called Reward and Recognition. This event takes place outside regular compensation worksheets due to various reasons; for instance, different approval workflows can be used based on the

award budget, the possibility to create multiple concurrent programs, etc. A Variable Pay (*VP*) is an additional element of compensation, in other words, short-term motivation for an employee. It is a form-based system managed by the administrator, not a planner or manager; nevertheless, the VP is separate from the compensation process using different data sources. There are different VP plan templates for each bonus timeline in the system. The template consists of the components needed for bonus calculation, such as employee's history data file, bonus plan details, bonus plan eligibility, business goals weights. After the VP form is created, it assigns to the first person, according to the approval workflow [12, pp. 126-128]. One of the SAP SuccessFactors Compensation features – Reward and Recognition is represented in the figure below (demo instance).

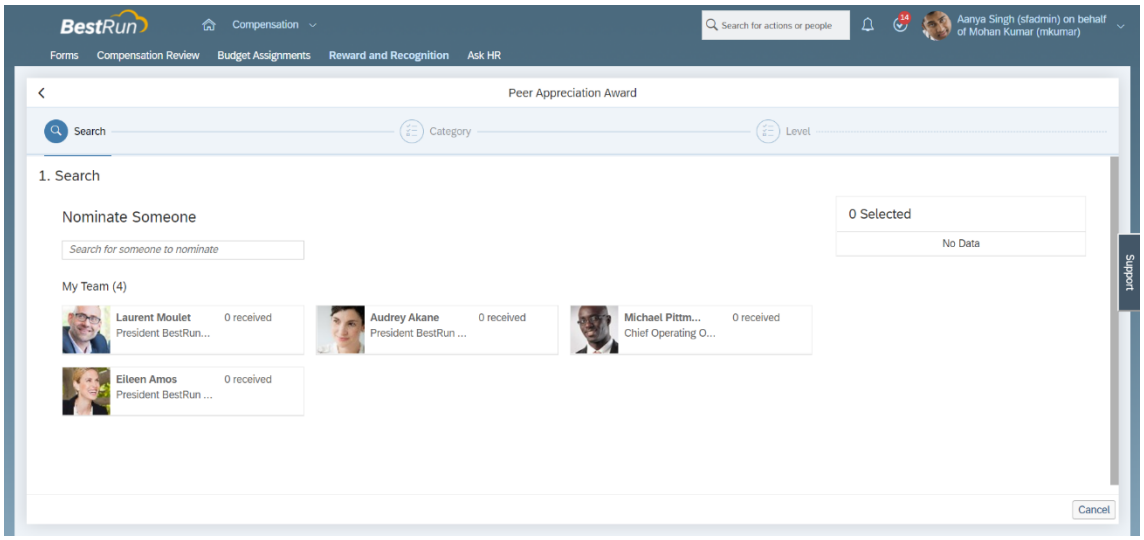


Figure 5 - Reward and Recognition, (created by the author).

2.6 SAP SuccessFactors Analytics Modules

Among the SAP SuccessFactors Analytics, two applications are available, - SAP SuccessFactors Succession and SAP SuccessFactors Analytics and Reporting. Succession management allows organizations to maintain their employees, identify gaps, and create succession plans by nominating employees to positions appropriate to their competencies and desired goals. As the formation of personnel or natural depletion occurs, urgent vacancies can be quickly filled, using the Add Successors functions. Everyday succession management tasks, including identifying candidates for critical positions, improving the accuracy of personnel decisions, filling positions more quickly, accelerating employee development and engagement, promoting key talents, making talent pools. People Analytics and Reporting provides a mixture of quite simple templates to create different

reports using SAP SuccessFactors solution. The Report Center is a source through which can be found all-ready-made reports and the tools to generate custom ones. [12, pp. 110-111, 132].

2.6.1 SAP SuccessFactors Planning

The primary tools available in Succession Management include a). Succession *Org Chart* a page that displays the hierarchy of the employees in the organization, including their potential and already nominated successors. b). Matrix Reports: There is two specific matrix view in place, Performance-Potential (correlation of performance with estimates of future potential), and How versus What (the ability of an employee to achieve goals based on competency assessments). c). Talent Search. The list-based overview of positions for succession planning; in other words, an option that supplements the Succession Org Chart, and enables planners to work the succession plans without navigating an organizational hierarchy [12, p. 114]. The Succession Org Chart is represented in Appendix 9 (demo instance).

There are three nomination methods in the application that can be highlighted, including a). Role-Person Nomination: This method is the simplest and is used mostly for the planning of personnel replacement. According to this nomination procedure, the successor will be associated with a combination of User ID + Job Code, depending on Succession Org Chart displayed hierarchy. This option suits well to the quickly growing companies that do not have yet a strong position management structure in place or looking for a more simplified way of administration and maintenance. b). Legacy Position-Based Nomination: This type of nominations uses a position structure that was created just for a specific purpose - succession planning. It means that position records have a fixed number of attributes: incumbent, manager position, critical position, and title. The benefit of this approach is that the planning of the to-be hired process does not trigger automatically losing associated succession plans while the user changes job codes or becomes inactive. c). Metadata Framework (MDF) Position-Based Nomination: It is a custom approach to the creation of the MDF positions (Generic Objects) through the Metadata Framework. This method offers the same options as Legacy Positions - keeping Succession Plans in-place during the necessary changes and planning for vacant positions. [12, pp. 111].

Talent pools enable to nominate employees to a category, set of skills, or job family rather than a specific job position. The talent pools can be sorted by names or by owners. Moreover, particular filters and custom fields can also be added as filters. An employee can be easily removed or added in Talent Pools, their nomination details, readiness status, and the displayed order can also be changed. Presentations provide an intuitive interface to compose talent reviews quickly. It is an excellent tool to use during Succession Planning and Talent Review with management as needed. Talent Cards displays a summary of the Employee Profile information [12, pp. 112] The Succession Talent Pools page, together with Talent Card, is represented in the figure below (demo instance).

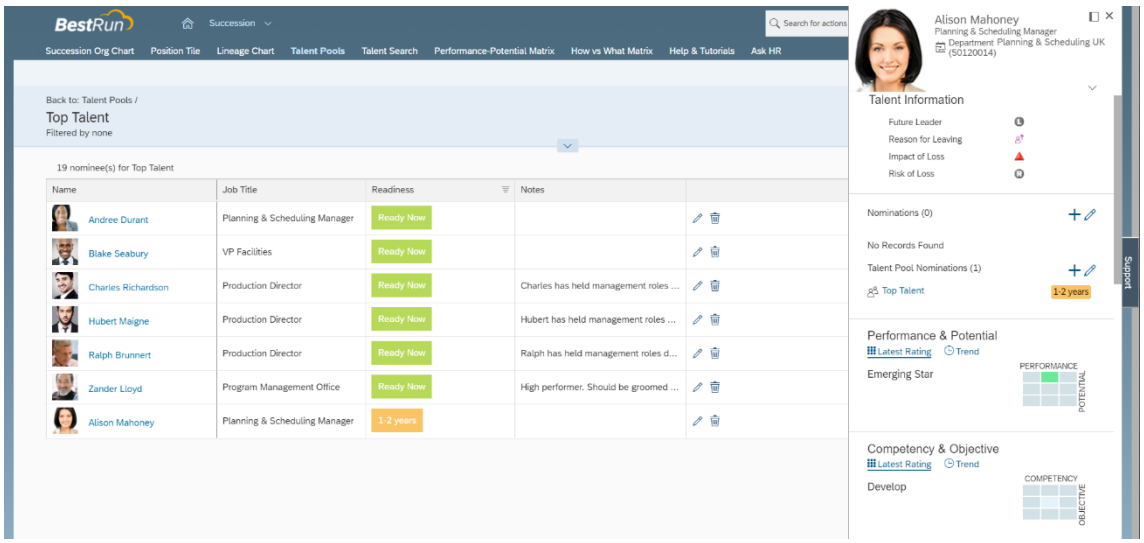


Figure 6 - Talent pools, (created by the author).

Succession management allows determining the incumbents or positions for the nomination as well as identify employees who are eligible for nomination. There are various options, including a) Top Tier: The senior-level positions in the organization, usually the CEO plus two levels below. b). Crucial: Typically, specific roles are essential for the present and future performance of a company. c). Functional Ladders or Pipelines: Normally used to build a structure of career networks that associate particular jobs to a specific area of professional expertise. d). High Potential Based: This option allows to identify the employees with high Potential and then assigning them principal roles and project that require appropriate leadership and technical skills in the future. e). Total Population: It is addressed to everyone in the organization, and engaging employees in knowledge sharing and self-development activities. The evaluation process is done using a set of documented facts (objective, verifiable data about candidates), subjective ratings

(well-defined, measurable tools), and commitment criteria (the individual's commitment towards the organization) [12, pp. 113].

2.6.2 SAP SuccessFactors Analytics and Reporting

"Dashboards" is an interactive tool that enables managers to view brief information for their team members. The data shown in the Dashboards form, based on the data of the whole team, and can be filtered by the manager as needed. The Dashboards include various features, including columns order sorting & filters to update data, download lists as CSV or Excel files, zoom into specific charts for details, etc. [12, pp. 133]. The Dashboards tabs are represented in the figures below (demo instance).

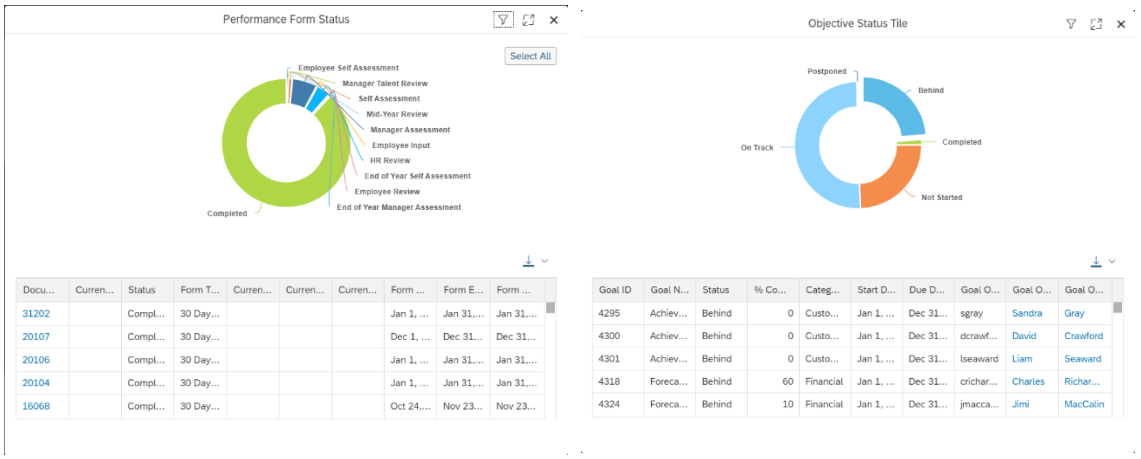


Figure 7 - Performance Form Status & Objective Status Tile, (created by the author).

Dashboard Tiles allow managers to oversee and quickly access the required information directly from their home page. As each dashboard tile is an independent tab, it can be replaced or reconfigured by admin, related to the user needs [12, pp. 134]. The Dashboard Tiles tabs are represented in the figures below (demo instance).

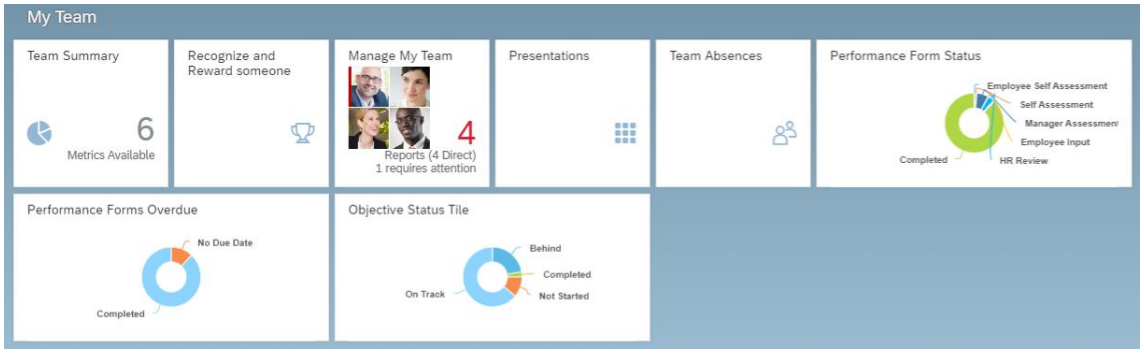
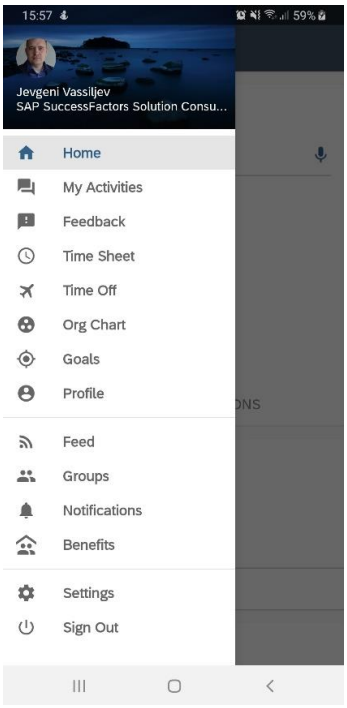


Figure 8 – Dashboard Tiles (created by the author).

Table reports is an intuitive platform that provides users services of creating a mixture of custom reports and sharing them across the organization. Among the types of reports can be noted a). Personal Reports: This type of report contains data related to local requirements and is regulated by the role-based permissions and depending on the employee's position level. b). Additional Reports: These reports provide specific business needs. Table Reports are the build-in part of the reporting platform and generate real-time reporting. The reports provide a simple process of creating and data exporting using numerous formats such as Excel, CSV, PDF, PPT. The reporting platform supports all the SAP SFSF applications, excluding LMS and data created through the Metadata Framework. There are three different data structures in place, including a). Single Domain: Enables to request data from one Report Definition Type. Multi Dataset: Allows to request data from two or even more Report Definition Types; if using this approach, the output will be displayed in different tabs. Cross Domains: Similarly, it enables to request data from two or more Report definition Types, and in this case, the report result will be combined and appear in a single list. The Canvas Report is a more advanced and user-friendly feature to generate and present reporting data more attractively. One of the options that can be mentioned is the tool that can be used to drag & drop different components onto a report page. Canvas Reports are available to the organizations that use Employee Central [12, pp. 134-135].

2.7 SAP SuccessFactors Mobile & Social Modules

Considering SAP SuccessFactors Mobile, it is essential to note that Mobile App is not an independent solution but an additional module that supports all core functionality of all SAP SuccessFactors Suite applications in their smartphones and tablet devices [11]. The activation of the SAP SuccessFactors App is a straightforward process. Each user can make the activation through the self-service option going to the Settings and sending an email with QR code and instructions. After installing the application, the user scans the QR code, enters the username and password, and accesses the App. The SAP SuccessFactors App activation emails are displayed in Appendix 10 (development instance).



The SAP Success Factors App has a simple, intuitive user interface, and enables employees throughout the organization to make the most common daily activities in their smart devices. The application supports iOS, BlackBerry OS, and Android software. Allows viewing My Activities, Notifications, Benefits, similarly, to give and receive Feedback, manage the Time Sheet, and Time Off. Besides that, an overview of the Org Chart, Goals, and Employee Profile, perform SAP Jam activities. Additionally, manage recruiting requisitions, and manage learning activities (if appropriate modules are activated) [11]. The SAP SuccessFactors App user interface (UI) is represented in the figures below (development instance).

Figure 9 - SAP SuccessFactors App UI, (created by the author).

The SAP SuccessFactors Jam is an optional platform provided as a part of the SAP SuccessFactors HCM Suite. Jam is a social collaboration tool developed to expand communication and sharing throughout the organization. Moreover, the platform can be used in the onboarding of new employees and expanding the collaboration across an organization. It is not so reached with features a LinkedIn or Facebook; nevertheless, it combines social-media services and provides users with the options to upload documents, create videos, Wikis, and groups, giving the right to join the group based on specific criteria. SAP SuccessFactors Jam is not an HRIS direct component and can be useful for the numerous tasks in the entire organization. The SAP SuccessFactors Jam platform is represented in the figures below [11].

2.8 SAP Success Factors Employee Central Detailed Overview

Employee Central is a core HRIS of SAP SuccessFactors HCM products family. It is a flexible software-as-a-service solution that provides a comprehensive set of core HR system functionality for organizations of all industries, sizes, and locations. Since Employee Central is placed in a cloud and it is multitenant, thus customers can be sure that the system is always up to date and generally new releases are delivered automatically without any effort from the customer side. Employee Central provides various

functionalities and additional features to match the needs of as many companies as possible. The description of the SAP SuccessFactors core HR module general capabilities is described in subchapter 2.4 of the current master's thesis [13, p. 27].

2.8.1 Provisioning

Provisioning is a backend system of the SAP SuccessFactors solution where the solution's modules and related to them necessary functionalities and additional features can be activated for a customer. Access to Provisioning for customers is not provided; some settings in the backend system can be also provided by Support tea and via Upgrade Center. The most essential system options are usually preselected but most of them need to be selected and activated manually based on the project requirements to each module by SAP SuccessFactors consultant. The Employee Central is the most complex of all possible in SAP SuccessFactors Suite module, and it means that numerous functionalities and necessary enhancements need to be selected throughout the provisioning process. This is also crucial in the case of a system new release through the Upgrade Center or some manual change or improvement. To make any settings in Provisioning, the SAP SuccessFactors consultant needs to have the appropriate certification that allows him or her to access the backend of the SAP SuccessFactors system. [13, p. 76].

2.8.2 Employee Central Data Model Layer

The data model layer of Employee Central is structured around various object types that interact with each other. The data models are *XML* format files that can be customized based on the organization's requirements. The *XML* file can be created from the scratch using necessary elements and fields or it can be downloaded from the Help Portal and adjusted as needed. The location of the different objects changes constantly with each following release. Many of the Foundation Objects being migrated to the Metadata Framework during recent years, more will be migrated in the nearest future. All the Foundation Objects that are being migrated to the MDF, are now MDF Foundation Objects. One of the reasons for that is to make the process of the module implementation more straightforward and quicker. Since, as soon as foundation object is moved to the MDF foundation object it can be configured not through the *XML*-editor but using a special tool named Configure Object Definition instead. It can be managed even by SAP SuccessFactors consultant who for instance, doesn't have specific skills of programming

[9, pp. 65, 13, p. 44]. To better understand the architecture of the EC data model layer the author has provided the figure of the data model structure represented below

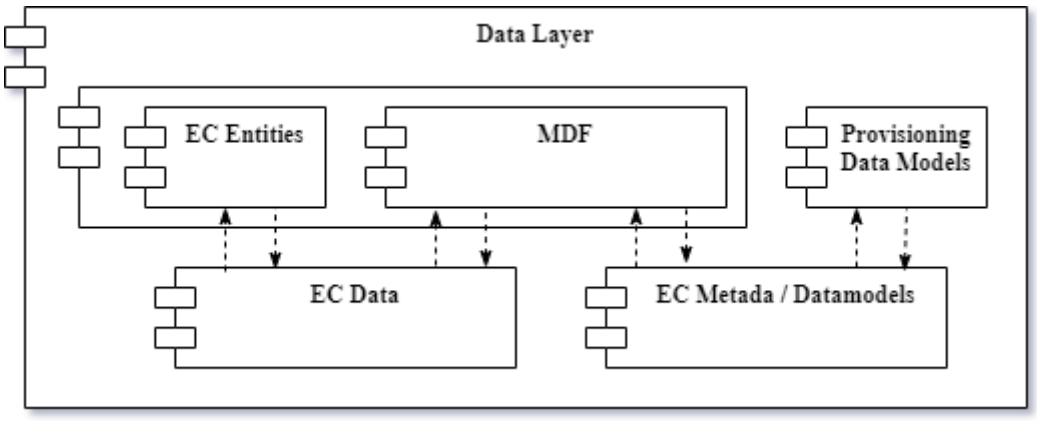


Figure 10 - Employee Central Data Model Layer components [39], (redesigned by the author).

Among the different object type for major

- Foundation Objects

  Using foundation objects such as job codes, departments, divisions, business units, etc. can be set up data that goes through the entire organization.

- Person Objects

  In this category are objects related to the person, including personal information, home address, contact information, primary emergency contact, etc.

- Employment Objects

  These objects are related to a person's employment such as Job Information, Compensation Information, Job Relationship, etc.

- Generic Objects

  Unlike the standard Foundation Objects, Generic Objects are objects that being developed on the Metadata Framework platform. The primary purpose of these objects in the system to maintain additional information and values when the standard Foundation Object cannot cover the specific requirements of an organization.

The data structure of Employee Central is determined through four *XML* data models:

- Corporate Data Model

  This data model consists of organization structure, pay structure, and job structure as well as other objects, such as event reasons, workflow, and dynamic roles.

- Succession Data Model

  This is where can be defined as the data related to people working in the organization, including compensation information and address information.

- Country-Specific Corporate Data Model

  This where can be set up country-specific fields and picklists for the HR system elements that have been previously set up in the Corporate Data Model.

- Country-Specific Succession Data Model

  This where can be set up country-specific fields, formats, and picklists for the HR system that have been previously determined in the Succession Data Model [9, pp. 83-105, 13, p. 40-44].

2.8.3 Picklists

Basically, Picklists are the drop-down menu with a various value that can be specified for a field. There are several types of picklists in the system, including:

- Legacy Picklists

  Picklists (Legacy) determine the information that triggers to display by clicking on a drop-down menu in the system.

- MDF Picklist

  MDF Picklists are the basic drop-down menu that can be used by the MDF object.

- Cascading Picklist.

Cascading Picklists allow creating a multi-layered Picklist where current value can be selected based on previous selection.

By default, all the picklists can be managed through the unified Manage Picklist UI. To make the implementation process more straightforward the SAP SuccessFactors team offers a possibility to migrate legacy picklist data to MDF picklist. After the migration is successfully completed all types of picklist might be managed from the united Picklist Center user interface. [9, pp. 237-248].

2.8.4 Role-Based Security Concept

Role-based permission is an essential part of the Employee Central, the approach that controls access into the systems defining who can see and do what regarding employee and organizational information. Permissions can be defined very granularly starting from review and processing concrete object or element and finishing with defining the permissions for specific field levels of this object or element. RBP framework controls all modules throughout the SAP SuccessFactors solution and is absolutely required regardless of the size and shape of the customers. The main principle behind the RBP framework is groups and roles created in the system through Set User Permissions UI. These two elements allow associating the user-specific experience with appropriate employee-level hierarchy [13, p. 89].

- Groups

  A group unites employees with similar characteristics; in other words, employees with the same authority in the organization or with similar responsibilities that are combined with a purpose to set the appropriate permissions and authorizations in the system. The group of employees that can control over other groups is indicated as Granted Users. The group of users that are controlled – Target users.

- Roles

A role is a set of specific access permissions that a particular user of a group will have when he or she accesses the system. To better understand the logic of the role-based permission framework the author of this thesis has designed the figure that illustrates the principle of the role-based permissions control approach [13, p. 90].

Figure 11 - Role-based permission framework [13, p. 90], redesigned by the author.

Initial access to the Manage Role-Based Permission Access has a Super Admin, usually an SAP SuccessFactors professional consultant from system implementing partner. It is a Super Admin who defines who will be responsible for system security on the customer side. The creation of Super Admin occurs in the Provisioning; in other words, in the backend of HRIS.

2.8.5 Position Management

Position management in Employee Central defines an organizational structure despite the presence of employees in it. In other words, the future structure of an organization can be built up even if there are not all positions are fulfilled with employees yet. Moreover, when the position is vacant the processes related to position run even smoother. There are several processes associated with a position that can be mentioned, such as recruiting, setting the goals, learning activities, succession management, forecasting, and budgeting, setting permissions, and defining authorizations throughout the SAP SuccessFactors product family. To visualize created positions in the system there is a tool called Position Org Chart that displays a hierarchical overview of positions and related to them actions choice. [13, p. 333-339].

2.8.6 Rules Creation

There are several types of rules in the HRIS that make the data change process much smoother and faster as well as to bring a logical sequence of automatically triggered actions in the system. Among them are:

- Event Reason Derivation Rules

  These rules defining the event reason (hire event, rehire event, termination event, changes to job information, etc.) based on which, specific employee's data change took a place.

- Business Rules in Employee Central

  These rules can be set up to activate specific further step or set of steps when data status is changed.

- MDF-Based Business Rules for Event-Reason and Workflow Derivation

  MDF-business rules framework is a new way of managing the event-reason rules and workflow derivation assigning them in the Business Configuration User Interface (BCUI) [9, pp. 201-236].

The primary goal of analyzing in more detail the core HR module was to understand its main principles, the structure of elements, and interaction with each other from technical perspectives to use this knowledge throughout the final phase of the current master's thesis, designing HRIS enhancement.

2.9 Chapter 3 Summary

Summarized the considered in third chapter cloud-based human capital management solution - SAP SuccessFactors it is essential to note that numerous functionalities and features evidently can meet the needs of many companies located in the Estonia market. The approach when HR solution offers a full employee lifecycle model and along with that, the HRIS is hosted in the cloud, is not entirely new to the local market but not so expanded yet and can be quite interesting. However, most of the local companies are not as large as SAP SuccessFactors solution developers possibly wanted them to be. In other words, it is possible that SAP SuccessFactors solution in some case may look overloaded with functionality for some customers. But there can be a lack of some functionalities and features that are crucial for the local market potential customers. To refute or confirm these concerns and to explore even more regarding the local market potential customers' expectation and needs the author of the thesis considers these aspects throughout following chapters.

3 Feasibility Study

According to the Wikipedia: “A feasibility study is an assessment of the practicality of a proposed project or system. A feasibility study aims to objectively and rationally uncover the strengths and weaknesses of an existing business or proposed venture, opportunities and threats present in the natural environment, the resources required to carry through, and ultimately the prospects for success…”[6, Feasibility study]. In other words, a Feasibility Study (FS) provides decision-makers with a comprehensive analysis that can be used as a rationale for making or rejecting the final decision and detecting the risks even before a project starts. According to Investopedia, a feasibility study demands specific goals and requirements for every single project. However, a few of the primary examples provided on this source can be used in the current thesis; others will be added additionally [16]. Thus, the set of requirements that need to be considered is next: company description including team overview, SAP SuccessFactors solution certification, market survey, competitive analysis, environmental analysis, feedback from stakeholders, project cost/income statement.

3.1 Company Description

The company Prominion OÜ was established in 2002 with a headquartered in Estonia. As an official SAP Silver Partner, Prominion OÜ offers SAP proven ready-made software solutions. Based on information from scorestorybook.ee estimated company Prominion OÜ has reached an annual turnover of about 1 684 059 € in 2019 [14]. The company Prominion OÜ mission is to help organizations achieve their desired outcomes and create smart, best-run businesses that help make the world run better. The company Prominion OÜ identifies, consults, buys, creates, integrates, supports, services, trains, and runs the finest SAP software solutions that best meet clients' needs. [15].

Among the solutions company Prominion OÜ offer to the clients, three main directions can be highlighted – Contact Center solution (SaaS), CRM solution (SaaS), and HCM solution (SaaS). The core functionality of the Contact Center solution is the management of inbound and outbound processes as well as real-time monitoring, reporting, and quality analyzing. CRM solution called Sales Cloud consists of the following main features and their combination, such as a tool for sales teams, a tool for finding the right contacts.

Likewise, CRM allows us to lock up deals and advance sales (Lead -> Opportunity -> Customer). Similarly, it helps in organizing email campaigns and surveys, etc. Moreover, it provides an overview of all ongoing sales transactions, their status, and potential sales turnover. [15]. SAP SuccessFactors solution contains all modules of talent management (recruiting, onboarding, learning, performance & goals, succession & development, and compensation management) as well as a set of core HR applications and their additional features, including Payroll, Time and Attendance management, and documents generation. Moreover, the SAP SFSF solution provides analytical applications as well as mobile & social collaboration tools.

The Estonian market is the main for the company Prominion OÜ, but the company also operates in Lithuanian´s market through the Lithuanian subsidiary UAB Prominion OÜ. The core clients are medium-sized local and international companies from various industries. There are few high-grows start-ups and public sector enterprises among the clients as well.

3.2 Team Overview

The structure of the company Prominion OÜ consists of various departments, including Marketing, Finance, Operations Management, Human Resource, and IT. According to the Employment Register, the number of employees in Prominion OÜ per IV quarter of 2019 was 18 (data are based on the Tax and Customer Board dataset). The structure of the company Prominion OÜ team consists of the several job positions: Chief Executive Officer (CEO), Cloud Solution (CRM and HCM) Consultants, Cloud Security Manager, Chief Technology Officer (CTO), Software Developers, System Administrators, Project Manager, Customer Support Manager (CSM), Customer Support Specialist, Chief Finance Officer (CFO), Human Resources (HR), Sales Director, Sales specialist, Project Manager position, Marketing Manager. Considering the team skills and their ability to manage complex projects, it is crucial to highlight that company Prominion OÜ employees are highly motivated professionals who ensure a full solution lifecycle starting from deploying cloud infrastructure and implementing a solution to consulting, and ongoing support and maintenance. Furthermore, software development services, custom hybrid solutions, complex software integrations, or product localization can also be provided by the team.

Describing the author's role in the organization is important to mention the main activities author is responsible for, among them analyzing, designing, configuring, and administration of SAP SuccessFactors core HR for the company Prominion OÜ. Moreover, participating in the SAP SFSF solution presentations and pre-sales processes, design and configure applications to meet customer needs while providing best-practice guidance on customer processes, manage the relationship with the customer throughout the implementation/support process. Besides that, take the initiative on eliminating issues, maintaining a hands-on role to ensure deadlines are met, and key deliverables are accurate. Finally, building of professional network with other SAP Partner´s consultants through the professional community sources, work-shop sessions, and professional social network. The main goal of that activity is to build a strong relationship with SAP SuccessFactors consultants to ensure collaboration between the companies. It can be used in case if one of the SAP Partners needs support with a project due to a lack of specific certification or in case of project size (too big for single SAP Partner).

3.3 SAP Success Factors Solution Certification

Considering the certification of the SAP SuccessFactors solution is crucial to note the importance of earning SAP SFSF application certificates for the organization. For a better understanding of the SAP certification regulation, the author brings out the facts related to the adjustment of partnership with SAP SuccessFactors. According to the SAP SuccessFactors policy, there are qualification requirements needed for SAP Partners that must be fulfilled before SAP Partner gets the right to offer the SAP SuccessFactors solution into the market. Moreover, their SuccessFactors consultants must be certified to gain access to the backend of the SAP SFSF system and be able to implement their project. There two options are available - the SAP Partner should have at least three certified SFSF consultants with at least one associate certificate (one certificate for one specific SAP SuccessFactors application) or one certificated SuccessFactors consultant with a three or more associate certificates (certificates for any of three SAP SFSF applications). The SFSF consultant is allowed to configure only the modules appropriate to the certificates that have been earned by the consultant; there is no possibility to work independently as a freelancer without the contract with SAP Partner. It's also important to note that to maintain current SAP SFSF certification, an SFSF consultant is obligated to review the "stay current" content and take the Delta exam twice a year. The learning

process and Delta examination take place with the help of the SAP Learning Hub portal; a SuccessFactors consultant receives the email reminder as soon as "stay current" content is available in the system. The screenshot of the Learning Hub Portal learning content page is represented in Appendix 11. The list of author's valid certifications can be found on the following link: (https://www.youracclaim.com/users/jevgeni-vassiljev). Thereby, according to the information from the official SAP source mentioned above, the company Prominion OÜ has an appropriate number of certificates, and consequently, rights to implement SAP SuccessFactors following applications: SAP SFSF Employee Central, SAP SFSF Performance & Goals, and SAP SuccessFactors Compensation as well as offer SAP SFSF solution in the market. Finally, the other SAP SFSF modules can be implemented through the SAP SuccessFactors professional network, engaging SAP partners with relevant certificates.

3.4 Market Survey

Analyzing the local market of human resources management software, the author of the current thesis has applied to the survey, the purpose of what was to get an overview of the tools used in the Estonian HR sector. According to this research that took place in October 2016 in cooperation with HRConf, Business Software Partners OÜ, and PARE, most Estonian companies that were participated in the survey were relatively high in innovation and IT use. The study was anonymous, and the questions covered the following topics software usage, including human resource management, time tracking, payroll, training, development, recruitment, analytics, satisfaction research, etc. Additionally, the questions related to the speed of implementation, quality, satisfaction with partner and customer support and product convenience, suggestions for software improvement, and its strengths [22].

The study mostly involved medium-sized and large companies: only 16.3% of companies had up to 50 employees. The largest group were companies with 51–200 employees (34.9%). 201-500 employees and those with more than 500 employees were 25.6% and 23.3%, respectively. A total of 103 respondents participated in the study. Most of the companies in the survey had a relatively high share of innovation and IT use. In 53.5% of companies, the percentage of employees who use computers daily was 90–100%. The rest were distributed relatively evenly, i.e., in about a quarter of organizations, the number

of computer users was 0–40% and in the last quarter 40-90% of all employees [22]. Considering aspects that have an impact on software choice, there 34.9% of companies stated that decisions on the selection of IT systems were made in Estonia, and only 7% mentioned that decisions are made outside of Estonia. 16.3% reported that the decision is influenced by both foreign colleagues and the local office [22].

The results of the survey showed that most companies choose HR tools for a long time. Nearly half of participants use human resources management tools for more than five years, 39,5% for 1-5 years, and 10,5% for less than a year. There is one more crucial factor that has a significant impact on decision making, which is an implementation period. Thus, 33.7% of respondents said that it took less than a month to implement the HR tool, 25.6% to three months, and 33.7% said that the process would take four months or more. The most attention-demanding trend here was the correlation between software implementation time and implementation satisfaction. In other words, in companies where the implementation of the software took a month or less, the implementation process was given an average score of 8 out of 10 possible. Those who went 1-6 months had already dropped to 6.5 points. Organizations where the implementation of the solution took more than six months, gave a rating of 4.88 for the satisfaction of the application. In other words, the procrastination of implementation projects is painful for companies. Finally, according to the study results, the Estonian human resources management solutions market is very diverse. Study participants use a wide variety of applications that will be described in the next subchapter. [22]. So, based on the information written above, it is evident that there is a market in place, and it grows from year-to-year.

Trying to determine a possible niche for the company Prominion OÜ in the Estonian market of human resources management software, the author of this master's thesis has created the SWOT analysis table (displayed below) to evaluate the future success benchmarks. Thus, in the provided matrix, the author brings into consideration strengths, weaknesses, opportunities, and threats related to competition and the ability to realize the project of launching the SAP SuccessFactors solution into the Estonian market.

Table 1 - SWOT Analysis, (created by the author).

Strengths	**Weaknesses**
• Strong reputation and technological platform of SAP SuccessFactors vendor in the worldwide market. • Highly motivated & skilled team. • Extensive experience in implementing complex projects of cloud-based SAP products for different customers from several industries. • The possibility of building a cloud-based IT products community around SAP SuccessFactors HCM solution, that helps to extend the functionality of all systems involving in process. • Availability of implementing projects through collaboration with other SAP Partners.	• SAP SFSF solution is not localized for the Baltic market. • SAP SFSF Payroll Application is not supported for the Baltic market from the Vendor side. • The lack of experience in implementing all available SAP SuccessFactors solution modules; especially, for large international companies. • Fairly long implementation period compares to other cloud-based human resource management systems provided in the market. • Fragmentation of SAP SuccessFactors solution, some of the modules are independent systems that were synchronized with each other.
Opportunities	**Threats**
• The cloud-based (SaaS*)* market trend in growth. • Leadership position, Prominion OÜ is the first of SAP Partners who are starting to offer SAP SuccessFactors in the Estonian market. • Developing a working relationship with other SAP	• Customers businesses cash flows still dropping, new projects canceled or pushed further. • Management issues and falling trust between all participants of the business process, due to impending crisis.

SuccessFactors implementing partners from other countries. • Opportunities to attend in foreign tenders, by implementing the project from a home office. • Improving sales performance.	• Human Resource Management software is not always a priority number one for an organization. • Increasing competition in the human resource management software market. • Possibility of a discrepancy between the expectations of the customer and partner regarding the solution licenses and implementation costs.

3.5 Competitive Analysis

Analyzing competitors' human resource management IT-solutions in the Estonian market, the author applies to the blog of Vladimir Jelov - "Personnel Software market in Estonia - Overview." The list of solutions, considered in the Vladimir Jelov's post, including a description of following solutions Dynamics AX/NAV Personal, Persona V3, Virosoft Personal, Taavi Personal, Tresoor HRM+. Based on the provided data, the author of the current master's thesis has designed the table (represented below) that displays leading local players and a description of the solutions they provide [21].

Table 2 - Local market competitors' analyses [21].

Software name	Description	Strengths	Worth to know	Licensing
Microsoft Dynamics NAV/AX Personnel	Microsoft Dynamics NAV/AX Personnel is represented in the Estonian market by two companies - Columbus Estonia and BCS	Both solutions use internally synchronized with Dynamics, Microsoft Office, SharePoint, etc. and are available in	To analyze the scope of the implementing project, and the initial investment can be complicated.	The Personal module has its license. Additionally, Microsoft licenses must be subscribed to or leased. It is necessary to

	Itera. The HR modules are not a part of the standard Microsoft Dynamics NAV/AX platform, but add-ons developed in Estonia. This solution can be the right choice for organizations that are already using Dynamic Business software. Approximately 13% of market share.	both ways, in on-premise and cloud-based form. Dynamics AX Human resource management is also available for the Latvian and Lithuanian markets, with the support of Columbus' sister companies.	The deployment itself can take several months.	look at software and license renewal prices for a period, as this is quite costly. Personnel deployment and licenses are the highest in the market.
Additional options	The benefit of the solution is the availability of additional modules as payroll and time management as well as other specific modules developed by other partners.			
Persona V3	Persona V3 is a web-based solution build-up by Fujitsu Estonia. Over the past 20 years, the product has changed its name several times and has been evolved noticeably. As the solution using the	The user-friendly solution with a simple, intuitive interface can be highlighted. As a cloud-based solution, it can be deployed quickly with minimal additional costs.	The functionality of the system is not easily changeable. Customization can be considered on the scale of a large project or system upgrade. If a	There is a price calculator available on the Persona website where monthly fee can be easily calculated. However, customers with a larger

	classic SaaS model, all updates and improvements reach all customers automatically, and there are no renewal/maintenance or other fees. Market share is about 18%.		customer searches for a more configurability, then other solutions need to be considered.	number of employees should ask for a personal offer. For instance, the price of one module: 50+1 users / 70 EUR.
Additional options	There are both payroll and time management modules. The system is regularly updated related to customer's feedback.			
Taavi Personal	Taavi Tarkvara has been long time one of the most popular business software in Estonia. Its payroll module has to some extent been the default solution for many of medium-sized companies. The personnel module has also good functionality and used to be quite popular among the customers. However, Taavi has not yet integrated his	Most of the HR managers and payroll professionals who began their careers 15 years ago can be familiar with this program.IT is necessary to mention easy installation, and relatively low price is also attractive, especially for small businesses.	The software is designed primarily for smaller businesses and has not developed at the same pace as other products in the market in recent years.	Licensing is based on the number of employees, and the price list is available on the website. For instance, the basic price of Taavi Personnel for the company with up to 35 users is 400 EUR. There is a set of additional modules and services available. The

	modules into one application and does not offer a cloud solution. Market share: 15%.			version update will cost 25% - 40% of the purchased package yearly.
Additional options	In addition to payroll, Taavi also has several financial modules that can be linked with the HR module if needed. Many accounting firms use Taavi to manage their clients' HRM and payroll, which makes the transition from outsourcing to in-house service very simple.			
Virosoft Personal	Virosoft Personal software has been developing for over 20 years and is currently available on two platforms - Oracle and Microsoft. The customers are mostly medium and large companies. The basic functionality of the product has been greatly expanded over recent years. However, it doesn't have a cloud capability, so upgrades are chargeable. Market	Extensive basic functionality and the ability to configure the system according to the customer needs free of charge.	The implementation of Virosoft is relatively long and complicated, and due to the size of the initial investment, this software is probably not suitable for a small company.	Virosoft itself is licensed on a per-module basis; additionally, it is necessary to take in an account a Microsoft or Oracle licenses and maintenance fees. The cost of each project is considered separately.

	share is about 14 %.			
Additional options	The Virosoft personnel module is integrated with the Virosoft working time, salary, and training modules.			
Tresoor HRM+	Tresoor HRM+ is another long-term player in the Estonian HRM software market, which is suitable for both small and medium-sized companies. It does not have a cloud version, but the installation and initial setup of the base solution are fairly simple and possible without a lengthy deployment process. The size of market share wasn't provided.	The benefit of the software is a quick and straightforward installation that can be suitable, especially for small businesses.	For a larger organization, it is essential to consider the long implementation process, in case of implementation of additional packages.	Employees and key selected licensing. The price calculation form is provided on the website. The cost of each project is considered separately.
Additional options	There is also a time management and payroll functionality and a separate analytical solution that expands the existing reporting capabilities.			

As an alternative, several systems presented in the market were mentioned in the post, where the functionality of the HRM software allows performing only time and payroll accounting. Among them are product Quinix (www.quinix.ee) Begin (https://begin.ee) that provide a service of planning the Estonian working time, and salary solutions, such as Noom (Astro Baltics), Taavi Palk, HansaWorld Books salary module, and Merit Palk.

There are also start-ups presented in the market, which can cover successfully one of the customer issues; nevertheless, other needs must be sorted out by other systems. Among them are Edutizer, (http://www.edutizer.com/et/), Skillific (https://www.skillific.com/), SportID (https://sportid.com/), Upsteem (https://upsteem.com/) etc [21].

Referring to the analysts from Gartner (https://www.gartner.com/), the author of the blog has mentioned of two big players that operate in the international arena, such as SAP (local market share 3,5 %; on-premises solutions) and Oracle (local market share 4,7%) but unfortunately hasn't provided detailed information about these solutions. However, some interesting facts were presented in the blog's article. For instance, the strategy of these players' development is based on acquiring smaller software developing companies and using their solutions for growing their own product family to the comprehensive, seamless HR solution. Additionally, it was also noted that considering some of these solutions, a customer should notice some of the possible challenges that can be faced later. Among them are quite high prices comparing to the local players' solutions, potentially large and lengthy deployment, and setup process as well as the challenging process of integration with local systems, especially if it comes to new features [21].

Analyzing the possibilities of the project successfully launching the SAP SuccessFactors HCM software into the market, the author of this thesis has designed a table that provides a basic description of the product and its pricing policy to compare SAP SFSF solution with other software described above. The results of the comparing analysis will be described later in the summary subchapter.

Table 3 - SAP SuccessFactors HCM, product brief, (created by the author).

Software name	Description	Strengths	Worth to know	Licensing
SAP SuccessFactors HCM solution	"SAP SFSF is a cloud-based software for human capital management using the Software as a service model"	SAP SuccessFactors solution supports a full employee lifecycle management starting from recruiting,	All the modules are synchronized and together provide a comprehensive seamless HRM solution. Even though SAP	SAP SuccessFactors HCM Suite (all modules) pricing starts at $84.53 per year per user; nevertheless, customers can

	Currently, the services translated into 41 languages and have more than 6,400 customers, with over 100 million users in 60 industries in over 100 countries. [6]. Payroll is not supported for Baltic countries. Solution localization is also needed.	onboarding, learning, performance and goals, time & attendance management to compensation & payroll, succession & development, and retention. Specific application modules for managers and HR-managers are also provided, such as Workforce Analytics & Planning.	SuccessFactors is a cloud-based solution, the process of its implementation is time-demanding and quite costly, and perhaps won't be considered by small businesses.	start from a single module whose price starts from under the 2$ per year, per month, implementation costs need to be taken in account anyways.
Additional options	There is a decent list of additional modules and systems available from the SAP Partners that are compatible with the core SAP SFSF system. Moreover, the SAP SFSF Suite API based on OData protocol enables access to data in the SuccessFactors system.			

3.6 Environmental Analysis

Considering the global economic prospects is necessary to divide the situation into before and after the spreading of coronavirus (COVID-19) globally. While writing a current chapter (03.04.2020) the coronavirus is affected (updating daily) 204 countries and territories around the globe, the number of confirmed cases is 1 085 989 people, recovered patients: 227 760, and deaths: 58 225 people [17]. All these terrifying numbers flag the situation world live right now, and its consequences are still difficult to predict. Indeed,

stock markets fell dramatically since mid of February 2020, and due to the war over oil prices, its prices rolled back sharply too. Besides that, most countries have travel restrictions; airlines stopped international flights. Moreover, many "non-essential" businesses are closed due to government restrictions. millions of people around the globe have lost their jobs, even more people still under the risk of losing their job, staying in their homes trying to avoid been infected. [19]. To better understand the impact of coronavirus on economic, it is necessary to look at the GDP per capita growth 2020 forecast that was made in November 2019.

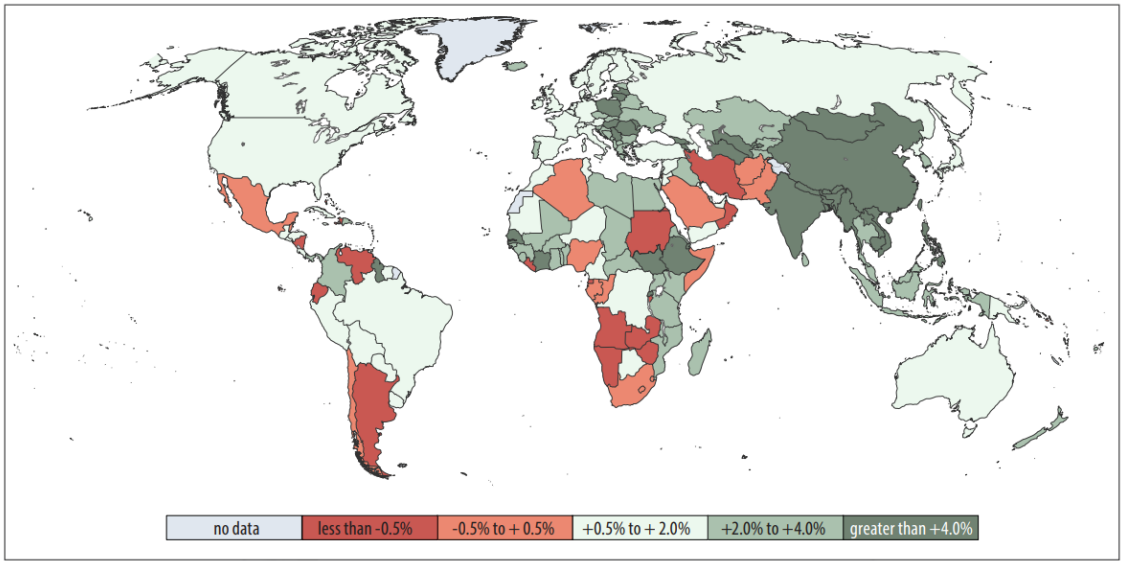


Figure 12 - GDP per capita grows, 2020 A. [18].

According to the forecast displayed in the Figure, the economic growth for the majority of the European Union countries was projected in a range between+0,5% to +2.0%; some of the EU countries expected economic growth was even higher than +4.0% [18]. Now compare the situation with the current forecast that was recently published. The difference between the two projections is displayed in the Figure below.

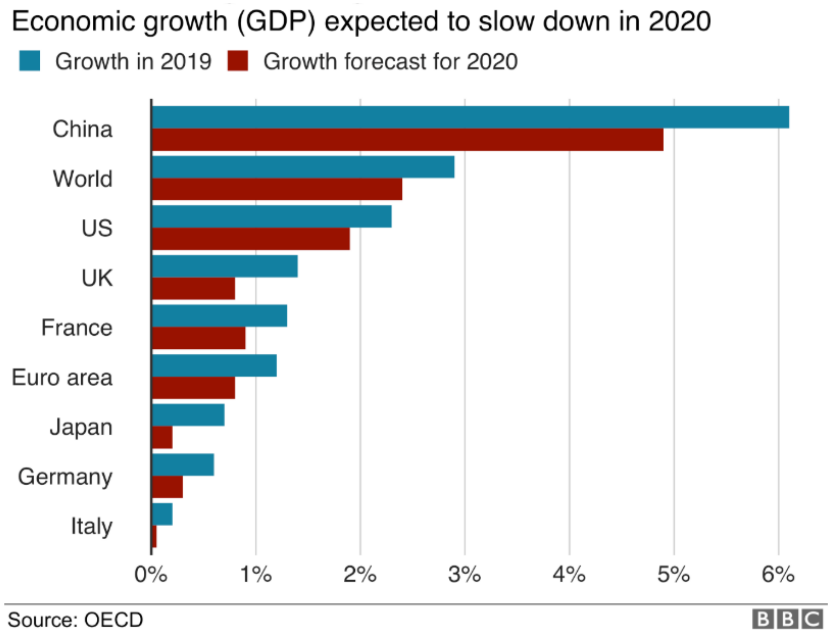


Figure 13 - GDP per capita grows, 2020 B [19].

The economic growth expectations had been adjusted downward, and perhaps, due to a more prolonged outbreak, they will be corrected even more. However, even in the reality of the global economic downturn, new business growth possibilities can be found. Moreover, the fact that Prominion OÜ core business is based on providing cloud-based services in the face of ever-increasing demand for remote work adds optimism and increases the chances of implementing the company plan – successfully launching SAP SFSF solution into the market. In supporting this assumption, the success stories of products using the SaaS business model can be provided as an example. Among them are Microsoft Teams (the daily active users (DAU) growth from 12 million in November 2019 to 44 million during the Quater1 2020), Skype (daily active users number increased up to 70% from just a month ago to 40 million of DAU), and Slack (12 million of DAU, up 37% over this time last year) [20].

3.7 General requirements for HCM Solution

To be sure that SAP SuccessFactors is competitive in terms of functionality in the realities of the Estonian market, the author has analyzed two public procurements for the HRIS system published by companies Eesti Energia As and Luminor Bank AS in June 2019 and March 2020, respectively. The documents were provided electronically via the e-Procurement Environment (e-PPR) at (https://riigihanked.riik.ee) in the case of company Eesti Energia AS tender, and through the e-Procurement Environment

(https://my.mercell.com/m/mymercell/default.aspx) in the case of Luminor Bank AS. It is essential to note that the packages of documents related to these procurements are large, and it is unnecessary to provide all the system requirements and other (security, integration, interfaces, usability, training, documentation, etc.) requirements for consideration in the scope of this study's analyses.

However, to determine the future perspectives of the SAP SuccessFactors solution, the author has created a table that displays the functional requirements, and some of the implementation questions for the HRIS system, that companies mentioned above striving to buy. The requirements are combined into a single table and marked with one of three colors that indicating the status of the requirement in terms of the capability of SAP SuccessFactors to cover it. Thus, the green color flags that the requirement is entirely achievable. The yellow color means that the execution of the requirement is limited or can be achieved using one of the custom approaches or integration with a third-party system. And red color means that currently, this requirement cannot be provided. This approach was proposed by the author to simplify work with the table, and its further presentation to the stakeholders. There is also a list of questions regarding additional options, and implementation processes, and requirements to the customer's team competency. The table is represented in Attachment 12.

The primary purpose of analyzing these requirements is to get a clear, comprehensive picture of the SAP SuccessFactors system capability from the potential customers' perspectives. In other words, what SAP SuccessFactors solution can do, and what cannot do as well as is this solution engaging enough to win the customer? Is the project of launching the SAP SuccessFactors system into the Estonian market worth it? Therefore, the results of these analyses allow us to encourage decision-makers and define the possible improvement that can make the solution more attractive to customers. Thus, the result of requirements analysis, as well as entire feasibility study outcomes, will be used for the existing HRIS future improvement (s) design in the further chapters of this master's thesis.

3.8 Chapter 3 Summary

All the aspects and facts that were considered and analyzed in the third part have brought confidence that the project of launching the SAP SuccessFactors will succeed, and here

is why. Firstly, the company Prominion OÜ has nearly twenty years of experience working with several SAP cloud-based solutions and knows the Baltic countries market very well. Secondly, the company Prominion OÜ has a highly professional and enthusiastic team that is well versed in the SAP products, and able to implement even complex projects as well as ensure a full solution lifecycle. Moreover, the company has a valid SAP SuccessFactors certificates that allow implementing most demanding applications of the HCM solution, and the partners can implement other modules through the management of company Prominion OÜ. Thirdly, the market survey presented in the master's thesis has shown that the market of human resource management software really is out there, and its current leaders operate on this market for twenty years already. Despite the harsh competition, it is evident that there is still a space for the player who can not only provide a full human resources life cycle but can also perform a customers' specific needs. Based on the analysis of the functional requirements provided by two potential customers through the e-procurement environment, we can conclude that most of the requirements can be covered by the SAP SuccessFactors applications' standard functionality.

However, SAP SuccessFactors solution price policy and implementation period duration are a cause for concern. According to the survey results [22], the question of the software price is relatively delicate for the customers, but even more determining factor for the customers is system implementation time. Based on that, to become successful in the Estonian market with this solution, the company Prominion OÜ team must ensure the implementation of SAP SFSF solution in a maximum of three months. And the price cannot be higher than Microsoft Dynamics NAV/AX and Virosoft Personal, which is genuinely possible. It's also necessary to mention that relying on the same functional requirements analysis, there is a set of issues been defined, including non-supporting payroll system for the local market, lack of system localization, the inability of allocating and editing time calendars and work shifts by the employee's direct manager or time manager. Besides that, too basic document management features and a limited number of documents and storage space in the system as well as lack of digital signature module based on the EU standard.

Considering the global economic conjuncture, it's essential to note that the worldwide economy is slipping into recession, due to coronavirus. Nevertheless, the new realities where companies should cut their costs, their employees are forced to work from home,

etc. make companies seek new approaches to manage their daily business processes and employees. In these conditions, and we can see it on the examples of other communicational and collaboration tools (such as Zoom, Microsoft Teams, Skype, etc.), the solutions that often using the SaaS business model, and aimed at the ability of people to work and communicate remotely can become a key technology to keep organizations' wheels on rails nowadays. And SAP SuccessFactors is not an exception.

In the fifth part, the author of the current thesis identifies and structures all the system functional requirements that were identified as needs that cannot be covered by SAP SuccessFactors solution standard functionality. Moreover, further research related to other unique requirements will take place through the interviewing of potential customers to identify their needs. It will be taken into consideration before the final decision of the SAP SFSF solution improvements will take place. Finally, combining all written above, the author's recommendation to decision-makers on this stage, to continue developing the SAP SuccessFactors project as according to the author's opinion, the solution has great potential in the local market.

4 Design Methodology

Historically, the development of design methods has been closely associated with recipes for a systematic design process. These process models generally include various stages, starting from recognition of the need for a new design and converting into a completed solution proposal. The number of phases can be different, but the logic of the process designing process always has a similar structure, including the following steps [6]:

- Discover - define the problem
- Define - set a scope
- Develop - potential solution proposal
- Deliver - a solution that works

The need to use a design methodology in the process of IT project implementation is difficult to overestimate. Widespread implementation of the principle of work - better, faster, chipper, and more motivates teams to systematize their activities in every way and adhere to a certain proven methodology throughout project execution. Among modern design methodologies, there can be highlighted five common design methodologies, including Instructional System Design, Design Thinking, Agile Design, System Thinking, and X Problem. Each of these design methodologies has an own purpose, primarily focuses, and phases the definition of which may vary depending on the source. However, the definition and primary value details of these methods are provided in the table below [23].

Table 4 - Design methods' definition and key value details [23].

Name of Methodology	**Definition**	**Primary Value**
ISD or ADDIE	A systematic method for development and learning platforms.	Business results are based on improved performance.
Design Thinking	A critical creative approach to define, analyze, and describe complex, non-structured	Activities are focused on the person/user needs, rather than

	problems and create a solution to solve it.	interests of the company, boss, or bureaucracy [25].
Agile Design	An approach for breaking tasks into small increments, with one to four weeks planning iterations.	Creates a dynamic learning environment through collaboration, and small but fast recurring iterations to support an agile approach to be ready for a rapidly changing environment.
System Thinking	An approach that allows viewing problems as part of the entire system. The outputs generally contributing to further development.	Uses a systemic approach to goals seeking rather than focusing on the independent elements to build up a complex interaction between all elements of the system.
X Problem	A method used for a complex problem, which does not lend themselves to standard planning methods.	Uses extreme adaptive methods to innovate when solving complex challenges, rather than standard steps that generally do not work well solving unique problems.

Considering the possibilities of using one of the design methods presented above, the author has decided to move further, supported by the design thinking methodology. One of the reasons for this decision is the fact that design thinking methodology can be easily integrated into the Agile framework of the further development process as company Prominion OÜ team internally and SAP generally using in the implementation of their projects' Agile methods. This approach was described in the post of Product Designer Lucía Bustamante, and the main idea of it was to put designers and developers work together, integrating Design Backlog into the Development Backlog throughout the following sprints, as displayed in the figure below [24].

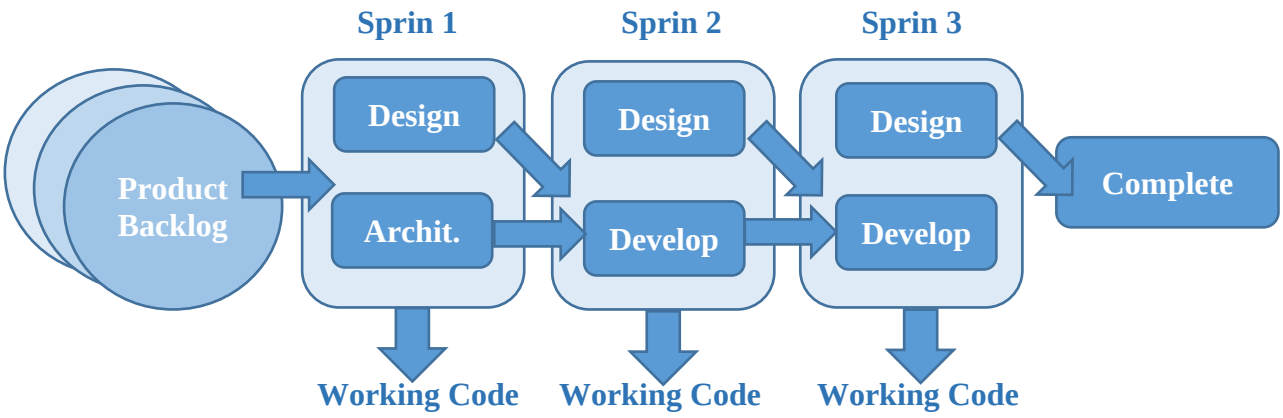


Figure 14 - Design and Development sprints in an Agile framework [24].

More importantly, the Design Thinking approach by the author's opinion can identify customer's problems most thoroughly and allows to create the most optimal final solution proposal. So, once again, Design thinking is a non-linear iterative process that seeks to understand users, challenge assumptions, redefine problems, and create innovative solutions for prototyping and testing it. The method consists of five phases or stages, including Empathize, Define, Ideate, Prototype, and Test. This methodology is more helpful for sorting problems that are not appropriately defined or either unknown. The five phases of Design Thinking methodology are displayed in the figure below [25].

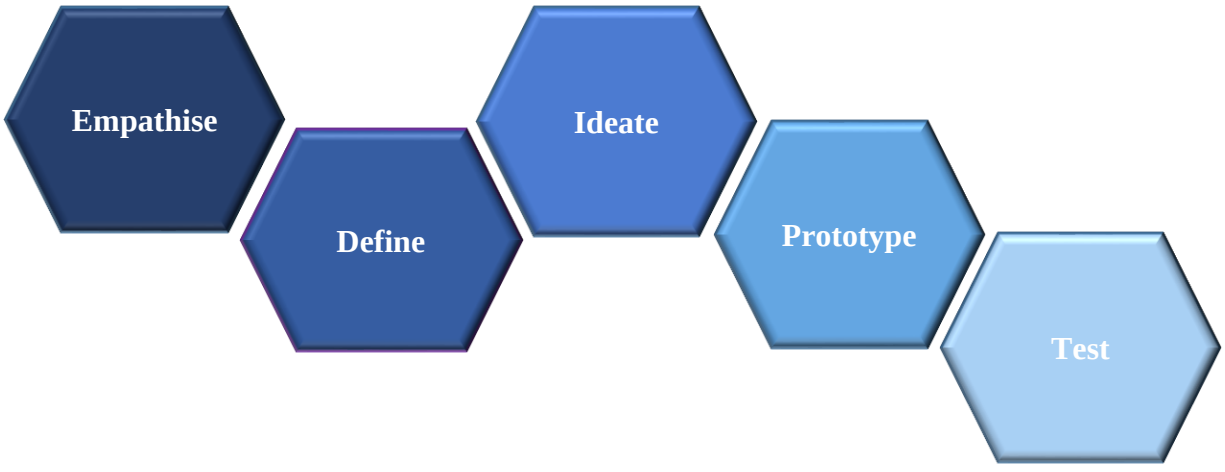


Figure 15 - The Design Thinking phases [25].

Considering these methods in more details, the author describes each of them separately.

1. Phase 1: Empathize - Research users' needs. The first phase of the design thinking process enables us to engage in other people's experiences to understand what excites them, their needs, and their desires. It is the main characteristic of design

thinking since empathy helping us to move away from personal assumptions and beliefs about the world and look at the problem through the eyes of the user [25, 26].

2. Phase 2: Define - Specify users' needs. This phase envisages systematizing the information that was received through empathy and analyze the observations as well as structure users' critical problems. The purpose of the focus is to formulate the question to which the answer to which will need to be found at the next phase [25, 26].

3. Phase 3: Ideate - Challenge Assumptions and Create Ideas. Once the main problems of the user have been identified, it is the very moment to "think outside the box," and to come up with ideas as well as work out a solution proposal. To succeed, it is essential to give up the critical thinking that we are all used to. Criticism can ruin a good idea. It is crucial to write down everything, even the most delusional thoughts, and only after the creative ends, select viable ideas and proceed to the next stage [25, 26].

4. Phase 4: Prototype - Start to Create Solutions. The primary purpose of this phase is to check the efficiency of previously provided ideas in practice. It is not necessary to create a fully finished solution. Instead, it is enough to make a budget version of the product with functions that will help to solve the designed problem. The prototyping allows us to find the way to the right solution, notice defects, refine it, and finally create a successful product. In case of failure to refute the hypothesis, save time and money. There are two ways to proceed further; depending on the result, if the prototype is successful, then it is necessary to take a step to the next phase. If not, then the process can be returned to the Define phase to identify a problem once again [25, 26].

5. There are two ways to proceed further; depending on the result, if the prototype is successful, then it is necessary to make the step to the next phase. If not, then the process can be returned to the Define phase, where identifying a problem process takes place once again [25, 26].

4.1 Chapter 4 Summary

Summarized all whiten above, it is essential to note that the five phases of the Design Thinking process are not always strictly consistent. Besides that, these phases do not have to follow any specific order and often can be used in parallel or switched and be repeated several times, iteratively. Thus, the phases should be considered as the various modes that contribute to the project, and not as successive steps [26].

Taking into account the current master's thesis's primary goal, the author using the empathizing, defining, and ideating phases of design thinking methodology provides a concept of possible enhancement of existing human capital management cloud-based system - SAP SuccessFactors. Along with that, the architectural structure of the future core HRIS extension, including representation of its most essential components and the scheme describing the interactions between core HRIS and its enhancement, will be presented as well. Finally, the author of this thesis creates the low-fidelity wireframe of the designing software; in other words, a visual representation of the future system extension as well as provides a set of next system additional functionalities and features. The prototyping and testing phases, despite their presence in the design process, according to design thinking methodology, won't be considered in the scope of the current master's thesis but can be included in the particular system future development plan.

5 SAP SuccessFactors HCM Solution Enhancement Design

Regardless of whether you want to create the latest system for your business from scratch or merely enhancing the existing system, the methodology of the design process needs to be defined before the project starts. According to the methodology been chosen by the author, five phases of the Design Thinking approach will be used in this master's thesis to provide the architectural concept of the existing system proposed enhancement, including Empathise, Define, Ideate, and Prototype, and Test stages. According to the scope of the current thesis, the prototyping stage will include the low-fidelity wireframe designing, and the testing stage will provide feedback from internal company users only. The output of these two stages can be used for additional improvement of concept, and further development of an interactive prototype, before the phase of final solution programming starts.

5.1 Empathize - Research Users' Needs

Among the main cons of the existing HRIS that were already identified within the third part (Feasibility study) of the thesis, four primary concerns need to be mentioned once again. Including a non-supporting payroll system for the local market, lack of SAP SuccessFactors solution localization, the inability of planning and managing of time schedules, and work shifts by the employee's direct manager or time manager. Besides that, too basic document management features and a limited number of documents and storage space in the system as well as lack of digital signature module based on the EU standard. However, as described above, the main purpose of the empathizing phase is uncovering users' needs by exploring their dissatisfactions, difficulties, and problems, trying to look at these problems through the eyes of the user. Thus, to advance in this process and collect enough data for the further defining stage, the author set himself the task to find the most optimal way of collecting information needed to substantiate the relevance of an already discovered requirement to the HRIS. Furthermore, identify other requirements that can be considered as possible issue that need to be improved during the HRM system further enhancement process.

5.1.1 Survey Data Collection Methods

According to the Wikipedia: "Data collection is the process of gathering and measuring information on targeted variables in an established system, which then enables one to answer relevant questions and evaluate outcomes." [6, Data collection]. There are two main types of data – quantitative and qualitative data. The quantitative data is measurable and generally expressed in numbers or figures. Quantitative research questions (who, where, what, when) are usually closed-ended and are associated with the survey objective that making the outcomes easily transformable into numbers, tables, charts, or graphs. Therefore, the data received by the quantitative data collection method can be applied to test existing concepts, to get feedback from the users regarding the product, and to find out what features need to be added to improve it. Among the main methods of quantitative data, the collection approach can be noted as closer-ended surveys and online quizzes [27].

The qualitative data generally not directly measurable and typically can be obtained through the observation or open-ended research as well as interview questions (why, how). It is a great way to uncover your audience's wishes, desires, and thoughts. Thus, data received through the qualitative collection data methods can be applied to search for new ideas and opportunities, to identify users' issues or requirements, etc. Among the core methods of qualitative data collection approach can be highlighted a). Face-to-face interview data collection method: obviously, one of the common types of qualitative survey, b). Focus group data collection method: generally, it is the same interview method only with a difference that, instead of being done face-to-face interview sessions, here participates in a group of people. c). Direct observation: It is an approach of qualitative data collection, where data collector observes the subjects of their observation and during this period makes notes, obtains different types of files, such as video/audio, photos, etc. [27].

Indeed, well-structured and analyzed data are becoming a powerful tool for correct decision-making. Considering different data collection methods described above, the author has decided to use a qualitative data collection method. Notably, to conduct face-to-face interviews identifying potential customers' issues and requirements. Similarly, to conduct a focus group interviews to reveal Prominion OÜ users' opinions regarding the SAP SuccessFactors solution generally, and obtain feedback as well as suggestions

regarding previously identified customers' requirements particularly. Finally, using the brainstorm technique the company Prominion OÜ team will help to shape the final vision of the current HRIS improvements as well as define the list of crucial functionalities and features.

5.1.2 Face-to-face Interviews and the Outputs

To obtain necessary data from potential customers, four interviews were organized and conducted with an HR-mangers and IT-managers that were represented companies from different industries with several branches across Europe. Among them were presented businesses of education, manufacturing, construction materials production, and heavy electrical equipment production industries, with a total number of employees from 130 employees up to 1300 employees. However, the average range of employees in interviewed companies was from 130 to 400 employees. The number of countries the companies were presented in was from two up to ten countries, including Estonia, Finland, Spain, Latvia, Lithuania, France, Portugal, Romania, Ukraine, Russian Federation, and the UK. The biggest of interviewees was a company with more than 147 000 employees, and presented around the globe: nevertheless, the interview with this organization representatives covered only the interests of local representation with 1300 employees. The primary objective of the interviewing process was collecting necessary data, including a) Types of systems the customer uses now. b) Possible problems or challenges that the customer faces with the current solution. c). Feedback regarding the SAP SuccessFactors software functional possibilities uncovered through the solution demo during the interview d). Identified cons of the SAP SFSF solution by the customer and suggestion of possible improvement noted by the customer side through the interview. The list of core question that been asked is displayed below:

- Brief Introduction.
- How many employees are currently employed at your company?
- What human resource information system do you use now? How many active users are in your HRIS (if there is any system)?
- What are your main concerns/objectives regarding the current HRM system?
- SAP SuccessFactors canned demo.

- What are the additional requirements you can note, which are not covered yet but are crucial for workforce management daily processes in your company?

- Closing speech and follow-up plan (is not a part of the master's thesis).

To better visualize the progress of face-to-face interviews the author has created a table the main goal of which to display the functionality mentioned by the customers as necessary or not covered yet by current system either due to lack of any system.

Table 5 - Face-to face interviews overview, (created by the author).

<table>
<tr><th>Interview 1</th><th>Industry</th><th>Location of Branches</th><th>Number of employees</th></tr>
<tr><td>Company: A</td><td>Manufacturing</td><td>Estonia</td><td>250</td></tr>
<tr><td>The current system (s)</td><td colspan="3">Now a company uses for human resource management two systems - Axapta 4.0 tools along with that self-developed additional modules, and SAP ByDesign human resources management module that in fact, does not cover all necessary business requirements.</td></tr>
<tr><td rowspan="3">The main concerns/ objectives regarding current HRM system (s)</td><td colspan="3">On the one hand, one of the primary goals of switching the systems is to reduce the strain of the human resources department and automate the workforce process as there is lots of repetitive operation still going manually.</td></tr>
<tr><td colspan="3">On the other hand, there is a need for collecting as much as possible data combined in one central system instead of how it is managed now through several systems and additional self-developed modules.</td></tr>
<tr><td colspan="3">Moreover, the SaaS business model seems attractive to the customer as in this case, there are no worries about neither hardware nor software, and that always ensures the latest version of the software in use without any extra costs.</td></tr>
<tr><td colspan="2">Additional requirements for the system uncovered during the interview.</td><td colspan="2">Comments</td></tr>
<tr><td colspan="2">The system should be able to configure notifications for</td><td colspan="2">All certificates can be stored in the system with a validity period and custom alerts can be created.</td></tr>
</table>

documents and certification expiration date.			
The system should have an option to create a custom report.		The special reporting tool is available in the system that allows creating a custom report regarding the user's needs.	
The system should provide the concurrent employment option, in other words, if a person works in a company in several positions at the same time.		This option is provided by default in the system.	
The system should support the Russian and Estonian languages.		SAP SuccessFactors supports more than 40 languages, and additional language cab easily activated in the backend of the system. However, the Estonian language is not provided yet, but core objects can be translated through the text replacement tool.	
The system should be able to generate employment contracts using a contract template stored in the system to avoid a human factor error; document digital signature option is also necessary.		The document generation tool is available in the system. The document can be generated and sent to the required user via e-mail and using the template stored in the system. However, there is no possibility of an e-signature module within the system.	
The system should provide an overview (by departments, production units, and other similar groups) of the workforce been planned to compare to how many are already fulfilled. The appropriate report should be provided.		This requirement can be fulfilled via SAP SuccessFactors Workforce Analytics and Workforce Planning.	
Interview 2	**Industry**	**Location of Branches**	**Number of employees**

Company: B	Education	Estonia, Finland	130+ and 50 contingent workers
The current system (s)	There is not a human resources management tool now. All employees' contracts stored in the file server. All the communication takes place through e-mail and public communication tools.		
The main concerns/ objectives regarding human resource management	The primary goal is to create a human resource database, including both employee data and their qualification information.		
	Moreover, there are other needs were mentioned as well, such as solution for employees' development and succession, maintaining of training and certification records and their validity monitoring (including data expiration date notifications). Time off management is also required.		
Interview 3	**Industry**	**Location of Branches**	**Number of employees**
Company: C	Construction materials production	Estonia, Latvia, Lithuania, Spain, France, Portugal, Romania, Ukraine, Russian Federation, and the UK	400 +
The current system (s)	There is not a human resources management tool now. However, the company uses based on the Microsoft platform payroll system.		
The main concerns/ objectives regarding human resource management	The primary goal is to create a human resource database, including Time management and Time Off management solution. In the long term, the customer is looking forward to implementing the full employee lifecycle management, starting from recruiting and onboarding, and until the person leaves the enterprise. At the same time, all the activities between these phases also need to be managed; thus, applications like training, performance and goals, succession and development, and analytics modules will be demanded as well.		
Additional requirements for the system uncovered during the interview.		**Comments**	

The Time Management and Attendance tool should allow managers to plan the work shift of their subordinates. The minimum scheduling period in one month should be provided. The intuitive user interface is crucial for the Time Management module.		So far this requirement cannot be provided by SAP SuccessFactors default functionality. However, some of the partners' additional solutions can be adapted for this task.	
The system should be able to transfer data into the payroll system.		So far SAP SuccessFactors a payroll module is not supported for the local market by the vendor. However, compensation data can bet transferred to the ERP system through the export/import operation.	
Interview 4	**Industry**	**Location of Branches**	**Number of employees**
Company: D	Heavy electrical equipment production	Presented globally	1300 in Estonia, 147 000 employees globally
The current system (s)	Currently, the company uses SAP ByDesign human resources management module along with that self-developed additional modules. In fact, almost all the necessary systems are in place, but they are fragmented. Therefore, these systems maintenance an even use are quite problematic and costly.		
The main concerns/ objectives regarding current HRM system (s)	One of the pain points is the employee development interview process held at least once in half a year, and which is already digitalized. However, the data obtained during the interview reaching the final Excel document manually.		
	The customer has a similar problem with training and organizing the feedback information. The process itself is digitalized, but the way how it's done so far needs to be upgraded. Currently, the final data overview is available through the Excel spreadsheet that is accessible		

	by both the organizer and the trainees what makes it nearly impossible to diverting of data according to the individuals' roles.
	The customer has also mentioned the unfriendly user interface of SAP ByDesign human resources management Time Off module.
	Besides the fact that the ByDesign solution also supports scorecards performance reviews and other employee productivity indicators, the customer looking for more advanced presentation possibilities inside of the system.
	In addition, the customer noted that the current system roles-based permission tool does not support the detailed separation of users into roles and groups.

Summarized the result of potential customers' interviews, it is important to note that the picture compared to the feasibility study outcomes has not changed much. In other words, the most of the customers' challenges can be solved by the standard functionality of SAP SuccessFactors, and a number of the customers' requirements that currently cannot be covered by the HRIS default features are still the same, including:

1. The system should support the Russian and Estonian languages.
2. The system should be able to generate employment contracts using a contract template stored in the system to avoid a human factor error; document digital signature option is also necessary.
3. The system should allow managers to plan the work shift of their subordinates. The minimum scheduling period in one month should be provided. The intuitive user interface is crucial for the Time Management module.
4. The system should be able to transfer data into the payroll system.

It is evident that among these requirements, two of them related to the HRIS localization (lack of Estonian language in the system) and non-supporting payroll system for the local market must be solved by the software vendor rather than the partner. Due to the complexity of the entire SAP SuccessFactors solution's architecture and integrations between different clouds, systems, and their elements as well as permanent innovation of this infrastructure, make localization from the partner side almost impossible. However,

the company Prominion OÜ continues to negotiate with the vendor through regional manager and other interested partners about possibilities of localization entire SAP SuccessFactors HCM Suite generally and payroll system particularly. Thus, using the method of eliminating, there only two requirements remained, that can be considered as qualifiers for further improvements, - work shift planning tool that allows managers to allocate the work shift of their subordinates, and developing of document management solution, including the e-signature module based on EU standards.

5.1.3 Focus Group Interview and the Outputs

To organize the survey data collection from Prominion OÜ own users was decided to set a group of five people inside of the company Prominion OÜ organization and give them access to the demo instance provide by SAP. The primary goal of providing users with a demo system access is because all modules of the demo instance are preconfigured, and the whole necessary data is already there. Among these users, different roles were defined, including System Admin, Manager, HR-manager, and Employee. This approach allowed us to test functionality through several scenarios and gave a wide picture of the system possibilities as well as its possible cons. The primary goal of this activity was to provide users the possibility of testing functionality of the SAP SuccessFactors HCM Suite in a safe mode and to obtain the feedback as well as suggestions regarding the HRM system and its possible improvements via focus group interview afterward. To display the current situation and the objectives of the company Prominion OÜ related to human resource management needs as well as provide the team feedback and suggestions collected throughout the focus group interview, the author has created a table presented below.

Table 6 - The overview of the main objective regarding the HRM, (created by the author).

Focus Group Interview	**Industry**	**Location of Branches**	**Number of employees**
Company: Prominion OÜ	Wholesale of computers, computer peripheral equipment, and software	Estonia, Lithuania	18, focus group team 5.
The current system (s)	There is not a human resources management tool now. However, the implementation of SAP SuccessFactors solution is currently ongoing.		

The main concerns/ objectives regarding human resource management	The primary goal is to create a human resource database, including all necessary data and documents associated with employees. The is no urgent need for an e-signature module.
	There are also needs for Time management and attendance, including Time Off management. In the long term can also be considered Performance & Goals and Onboarding applications of SAP SFSF HCM Suite.
	Besides that, it is essential to have appropriate knowledge and skills level regarding all SAP SuccessFactors applications available in the Suite since Prominion OÜ has a right to offer full SAP SuccessFactors HCM Suite. It will be great to get additional experience implementing all modules of the solution internally, even if there are not business needs for it now. However, to do that, there should be several things in place as a budget, a bigger team of consultants, and a clear rationale for it.
Additional requirements for the system uncovered during the interview.	The Generate Document tool needs to be improved. The current solution user interface and functionality are too basic. The tool is not available on the Home page and can be found only through the search. Since an externally signed documents can be uploaded into the system, the e-signature module is not crucial for the company Prominion OÜ team.
	The Estonian language in the system will be handy, but this is not an essential requirement for the company Prominion OÜ.

Summarized the result of the focus group interview it is essential to mention that due to limited time and reach functionality as well as countless features of the SAP SuccessFactors Solution, the team has tested scenarios, most related to the company Prominion OÜ internal needs, such as:

1- Recording the weekly working time through Time Management in the Employee Central. The goal of this testing was to try several scenarios of using different time recording methods, including a). Negative: Where employees record only exceptions from their planned working time, plus any overtime, on-call time, or allowances; time itself stores automatically. b). Positive: In this case, the

employees record manually their attendance time, in addition to overtime, absences, on-call time, or allowances. c). Only absence: This allows employees to record only their absences; for instance, where absence data is required for internal administrative purposes.

2- Maintaining the absences through the Employee Central. The process included testing of different types of absences like Vacation, Sickness, and Personal Leave. The approval workflow was also activated and used throughout the testing sessions. Depending on workflow type, in certain cases, manager confirmation was necessary; in some, the manager simply received a notification from the system.

3- Creating a new goal through the Performance & Goals application. Setting up a new personal goal or some group objective is a straightforward process. The only thing is that to create an entire company goal the appropriate role-based permissions need to be given by the Administrator.

4- Testing Add New Employee process by creating a test user in the core HR module. Basically, the process itself is straightforward that includes filling a decent number of fields related to different types of employee data, including biographical and personal information, job information as well as compensation information. Since testing took place in a demo system, there were several difficulties due to a lack of appropriate data from the tester side. As some fields were mandatory and equipped with validation rules, the system been warning that the inserted information is not correct by displaying alert like “Expected format is MMM dd, yyyy or Use the format NNNNNNNNNN”, etc. Finally, the tester by choosing alternative values was able to finish the hiring process successfully.

5- Testing the onboarding process through the Onboarding module. The process itself resembles the Add New Employee process. The only difference is that the onboarding process is much longer and has several phases. Basically, the first stage is to look through necessary initial documents and then sign them digitally using the in-build DocuSign e-signature management. After the documents were signed the testing of the onboarding process was finished. Other long-term

processes: for instance, plan for the first week or a month were not tested during testing sessions.

6- Generating the document through the Generate Document tool in the Employee Central. The functionality of this tool is minimal, and the user interface including only six drop-down fields, such as Country/Region, Language, Template, User, Date, and Document Type in the middle of the page. All functionality comes down to two actions, send the document by email to the employee, and download it in PDF or Word format. However, the document generator is there and could be used for basic operations generating and sending or downloading documents. Additionally, the downloaded documents can be signed digitally and uploaded back into the system by the specific user this document was addressed to. The document can be saved through the specific attachment field under the one of employee profiles sections.

So, mainly due to the quite small size of the company, the results of the focus group interview have shown that there are not any specific requirements mentioned by the company Prominion OÜ team that SAP SuccessFactors cannot cover by its standard functionality, except previously identified poor functionality of the Generate Document tool and lack of Estonian language in the system. Nevertheless, the focus group during their test sessions was sufficiently familiarized with Employee Central Time Sheet and Time Off as well as the Generate Document tool present in the system. This experience was also used in a brainstorming session to make the final decision and define crucial functionalities of the HRIS improvements.

5.1.4 Brainstorm Session and the Outputs

According to Wikipedia: "Brainstorming is a group creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members" [6, Brainstorming]. The primary goals of the brainstorm session were defined as a). Based on the whole previously obtained data to determine the most crucial problem related to the current HRIS that need to be improved. b). Moreover, the focus group members were tasked to bring in front their vision of future enhanced systems by proposing its crucial functional and non-functional requirements via the brainstorm session.

Considering the remaining options, namely improving the existing Generate Document tool, and designing of Work Shift Management (WSM) tool, several ideas were proposed by the organized focus group. Among them is improving existing systems to refine the capability and performance of noted IT tools, replacing these tools via integrations with third parties' systems, and even developing new solutions from scratch.

Summarize the ability to enhance the Generate Document tool; the focus group members have concluded that due to poor initial functionality of existing documents generating tool, it seems irrational to improve it. The development of a full-fledged document management system is costly, and time demanding and not always guarantee the best results. Finally, the focus group has concluded that the best methods to improve the existing document generating system is to replace it via integration with a third-party document management solution that already has in-build digital signature modules supporting all Baltic countries' digital signature format. One such player is company DocLogix that offers the Document and Process Management System in several countries, including Estonia, Latvia, and Lithuania. Moreover, their solution has a build-in e-signature module and the system can be deployed in the cloud. Moreover, the author has already contacted the DocLogix representative and discussed the collaboration possibilities and the ability to integrate two systems, and the potential partner reaction was quite positive. The rationale for this decision was several facts, including cost efficiency, the speed of result achievement, and sharing of the risks. However, this project will not be considered in this master's thesis and will remain as possible SAP SFSF software further enhancement proposal.

Finally, the focus group members have considered possible approaches to enhancing the SAP SuccessFactors Employee Central application's Time Sheet tool. The idea of developing end-to-end Time Management and Attendance solution from scratch was not considered due to the varied resource demands. Among remained once two possible methods were analyzed, integration with third-party Time Management and Attendance systems that already has an integration package with SAP SuccessFactors Employee Central time management modules, and creating of own Work Shifts Management tool to enhance existing time management functionality. Even so, if the integration project seemed the most suitable option as it already out there and can be used straight away. However, upon closer examination, the development of its own Work Shift Planning tool has become even more attractive.

Firstly, some of the partner's time management ready-to-use solutions are quite costly, and their license price can be as much as SAP SFSF core HR module's licenses price, which for sure will make potential customers think twice before purchasing it. For instance, the Time and Attendance solution of company Kronos provides advanced, but despite that, a relatively expensive solution. Secondly, the functionality of the other Partners' time management solutions is quite limited. For example, the Clock Time Tracker for Employee Central Time Sheet of company Metafinanz. Even though product price is quite reasonable (One-Time Fee / Unlimited Users), along with that, the provided functionality will not cover potential customers' requirements identified previously. Finally, developing own Work Shift Planning software gives a possibility not only to cover the requirements of current potential customers. Placing it into the SAP APP Center allows the company to create additional cash flow by offering a solution to other partners and customers globally. So, the final decision was made. The author went further with the resolution to create the concept of Work Shift Planning software to enhance the functionality of the existing Employee Central Time Sheet tool.

During brainstorming, based on the feasibility study results, potential customers' interviews, as well as the focus group members SAP SuccessFactors solution user experience and their expectation related to the Work Shift Management tool the most essential requirements for functionality, were formulated, including:

1. Accessing into the Work Shift Planning system must be provided through the SAP SuccessFactors application with the same Username and Password.

2. The Work Shift Management system must be embedded in the SAP SuccessFactors Fiori user interface.

3. The access into the Work Shift Management system must be provided directly from his or her SAP SuccessFactors EC Home Page through the built-in tile.

4. The Work Shift Management system must be synchronized with the existing Employee Central Time Sheet system.

5. The Work Shift Management system must be synchronized with the existing Employee Central Time Off.

6. The Work Shift Management system should allow:

- To define the Work Shift Management application users' permissions directly through Manage Role-Based Permission Access settings in SAP SuccessFactors.
- To create employees' groups based on organization business needs.
- To customize the application if needed.
- To determine the minimum and maximum length of the work shift.
- To create the work shift plan for all possible organizational departments and groups of employees.
- To edit the work shift plan.
- To approve on behalf of the manager reported by Employee worked time (in case of using positive time recording method in Employee Central Time Sheet tool).
- To overview statistics about the amount of planned working hours filtered by different periods.
- To reply to employee requests.
- To review work shifts plan related to an employee or group of employees.
- To download or print out a work shift plan if needed.
- To send a request to the Manager in case if the work shift plan needs to be edited or shift change needs to be undertaken.

7. The Work Shift Management system additional statements:

- The Work Shift Management System should provide self-service.
- The Work Shift Management System should provide the possibility to reuse and adapt previously created and saved work shift plan for creating new plan.
- The Work Shift Management system should provide drag and drop and copy-paste functionalities to edit the existed shift schedules.
- The minimum scheduling period in one month should be provided in the system.

- The Work Shift Management system should allow recording stored work shifts time using the Employee Central Time Sheet system.

- Several recording methods should be in place, including Positive, Negative, and Absence only, both automated and manual approaches are needed.

- The Work Shift Management system should allow creating basic reports and export necessary data from the system using the CSV and Excel format.

- The Work Shift system should provide notification service through email and system message. Example: the employee receives email and system notification as soon as a work shift plan is ready and got approved by the Manager.

- The intuitive user interface is crucial for the Time Management module.

- Optionally, the Work Shift Management system should allow creating vacation plan for the department or a group of employees.

Summarised results of brainstorming, it is necessary to highlight that all primary goals were achieved. Firstly, the most crucial and response requiring problem-related to the SAP SuccessFactors software that needs to be improved has been identified. Secondly, the vision of most essential system requirements based on results of the feasibility study, potential customer's interviews, and experience of the SAP SuccessFactors system by focus group users were also formulated. The next step, according to the Design Thinking Methodology, is focusing all the obtained information and bringing it in front clearly defined the concept of future Work Shift Management application.

5.2 Define- Specify Users' Needs

Considering one of the primary goals, namely, to identify the most demanding issues related to existing HRIS and to propose its enhanced version in the way that it covers internal Prominion OÜ needs as well as potential customers 'requirements, the author has obtained and analyzed all necessary data. Along with that, using different methods and support of his team (focus group brainstorming), the author has also provided a set of the most important system requirements needed for creating of Work Shift Management tool, planned to enhance the existing SAP SuccessFactors Employee Central Time Sheet

module. During the current Define phase, the author will focus on the possible Work Shift Management tool concept and its detailed description to provide a clear vision of further developing of Work Shift Management application. Using mostly best Agile approaches and practices, the author will provide [28]:

- Vision and primary objectives.
- IT SWOT analysis.
- Principles and rules.
- Business roles and actors.
- Structured functional and non-functional requirements using FYRPS+ method.
- User stories.
- Possible solution definition.
- Scope definition.

5.2.1 Vision and Objectives

The main objective of designing the Work Shift Management tool for existing SAP SuccessFactors Employee Central Time Sheet module, - to allow future system users to manage works shift plans, create necessary groups, define the permissions, and customize work shifts as needed. According to the vision of the Work Shift Management tool must be built-in into the existing SAP SuccessFactors Fiori UI, the application itself should be accessible with the same username and password directly from the User's SAP SFSF EC Home Page via embedded WSF tile. The new application should be synchronized with an existing SAP SFSF EC time management module. The WSM UI must be intuitive and straightforward to meet potential customer's needs [29].

5.2.2 IT SWOT Analysis

To get an overview of how future Work Shift Management tool fits into the current environment, the author has provided the IT SWOT analysis represented below to define possible strengths, weaknesses, opportunities, and threats. One of the main ideas of IT

SWOT analyses is to know the strengths, try to eliminate weaknesses, identify new opportunities, and to defend of possible threats.

Table 7 - IT SWOT Analysis, (created by the author).

Strengths	**Weaknesses**
• Wide functionality of the core system supporting employee full life circle • Strong multi-layered approach to security of SAP SFSF solution • Personal approach • Maintenance & Support • Highly professional team • WSM tool time recording and reporting processes automation	• Fairly limited functionality • Dependence on SAP SuccessFactors • Not always effective cooperation between the IT and business side
Opportunities	**Threats**
• Growing Cloud-based technology trend • WSM application further improvement • Empowering partnership with other implementing SAP partners • Ability to publish WSM application to SAP App Center globally	• Lack of SFSF consultants in the local market • Dynamically changing core HRIS • The risk of duplication functionality from vendor

Summarizing the results of the IT SWOT analysis starting from strengths, it is essential to note the rich functionality of the core HRIS with which the Work Shift Management tool will be synchronized. Similarly, its strong security multi-layered architecture that especially crucial for cloud-based software to win the potential customers' trust. These two factors ensure that the planned WSM tool will be smoothly embedded into the already successful solution, and its extended version will help to engage even more customers. Besides that, the WSM application several processes automation, highly professional

team, personal approach, and providing maintenance and support services ensure that the customer will remain with the service provider for a long time.

Considering the mentioned weaknesses is necessary to highlight that the planned Work Shift Management system based on previously identified requirements apparently might not be designed as an independent system but as an extension to the existing SAP SuccessFactors solution. Consequently, in this case, it will be depending on SAP SuccessFactors and will not be able to operate without deploying core HRIS. As an additional functional module to the core HRIS the Work Shift Management tool might have limited functionality. However, all necessary options based on previously identified requirements will be provided in the system. Additionally, not always effective cooperation between the IT and business departments was noted as a possible weakness inside of the organization. It is vitally essential to improve such collaboration as the success of the entire enterprise depends on the quality of the whole team interaction.

Analyzing opportunities, it is almost impossible not to note the cloud computing crowing trend. The events of the latest months related to coronavirus just busted interest to cloud-based collaboration and communication solutions, and cloud-based solutions able to support managers to lead employees remotely is not an exception. Moreover, developing of a new partnership with other SAP SuccessFactors implementing partners allows to reach more opportunities and participate in more complex and interesting in every sense, projects. The ability to offer the WSM application to other partners and customers using products of SAP Success Factors family via SAP App Center globally as well as Work Shift Management application further improvement.

Identifying possible threats, the author has mentioned a lack of certified SAP SuccessFactors consultants in the Estonia market. Additionally, the risk of creation of an extended version of Employee Central Time management applications by company SAP SuccessFactors itself. Dynamic change of core HRM system might create difficulties supporting existing integration with the Work Shift Management application.

5.2.3 Major Principles and Rules

To make sure that the whole team sees the situation the same way, it is essential to discuss and set up the most important principles of the system design. It is essential to decide whether the system will be developed from scratch or one of the existing systems will be

used as the foundation of the new software. It is also necessary to determine will new technology be used or existing one throughout the development as well as a decision regarding the delivery of the system. Finally, rules need to be defined and delivered to the rest of the company [30].

Considering all previously collected data regarding the planned Work Shift Management tool, it becomes evident that to cover provided above requirements related to accessing the system, embedding application into the SAP SFSF UI, using the SAP SFSF EC Home Page as an application entering point, as well as synchronizing WSM tool with SAP SFSF EC Time management modules brings us to the decision of using SAP SuccessFactors as the foundation system. Thus, the Work Shift Management tool (thereinafter Work Shift Management extension), in this case, will be used as an extension for the existing SAP SuccessFactors Employee Central Time Sheet and Time Off module (as these modules have unified database). As always, any decision has its pros and cons and this case is not an exception. So, the negative side of this decision is that the Work Shift Management tool will not be an independent system but contingent on core HRIS. But there are its own benefits as well. Firstly, in case of using this approach the SAP SuccessFactors system database can be used that allows the developing team to move faster, ensures cost efficiency, and helps to avoid excessive technical issues, at the same time. Also, this method allows synchronizing these modules more seamlessly and helps to provide continued hassle-free integration support.

Moreover, acting in this way, all the necessary developments can be done in-house without the need for experts from SAP. Similarly, this approach removes questions related to the technology used throughout the developing process. It is obvious that the development of the WSM system will be based on existing SAP SuccessFactors HCM Suite technology (will not be considered in detail in the scope of this master's work; more detailed information can be found at https://help.sap.com). Taking into account previously identified (IT SWOT) possible risk related to duplicating this extended functionality from company SAP SuccessFactors, the final decision related to creating of the system seems especially effective.

The next step is to define the necessary rules:

1. The system has customers. Each customer includes several users. The user can be in the role of Administrator (Manager job position) or User (Employee job position).

2. Each user is related to at least one customer. Each user has separate access to the customer's system.

3. The accessing of the customer's system is provided through the SAP SuccessFactors system (core HRIS). The User can login through SSO or standard username/password log in based on system settings.

4. The Work Shift application is embedded into the SAP SuccessFactors Fiori UI and is accessible directly from SAP SuccessFactors HCM suite Home Page via the built-in tile.

5. The Work Shift Management system users' permissions are defined by the Administrator. The Administrator can manage permissions of only existing in core HRIS users. This process takes place through the core HRIS in appropriate settings tool (Set User Permissions).

6. The Work Shift Management system should meet the data privacy and protection regulation and to be *GDPR* compliant.

5.2.4 Business Roles and Actors

Typically, under business roles, understand the roles that are somehow associated with a developing system. The development team is responsible for delivering a system that in the end must meet initial objectives. Generally, the team consists of system users, managers, system analysts, programmers, technical specialists, and other stakeholders. [31] In the framework of the current project the business roles were defined as follow:

- The author of the current master's thesis is in the role of Systems Analyst / Project Manager. The primary responsibility is analyzing deliverables of designing Works Shift Management extension as well as providing HRIS functionalities and their specifications to the developing team members. The communication and supporting the relationship with potential customers' users are also part of the

author's tasks in the framework of this project. Additionally, in the scope of the current master's thesis, the author will provide his vision of the possible architectural concept as well as the design of future Work Shift Management extension.

- The CIO of the company is in the role of System Architect and IT Project Manager. The most important task of his first role is to determine the architecture of the future system as well as defining the technologies that need to be used in the system designing process. Being in the role of IT Manager, the CIO in case of this project will define the critical chain and build a plan to use team resources most efficiently, oversee the budget of the project, make sure that all the planned tasks completed in time, and with the quality required.

- The software developers team consists of two people; each of them will combine ordinary tasks with additional roles. Thus, one of them with more significant experience is in the role of Developer / UX Designer, and the second one is in the role of Developer / Tester. The primary responsibility of the development team throughout this project is the production of reliable and maintainable code and its proper testing as well as UX designing tasks.

- Last but not least, users and other stakeholders. Among these groups are potential customers' users and company Prominion OÜ internal system users and management. It is through users will be collected necessary feedback related to the development deliverables to define changes needed for the next sprint and give it a start. And management is an administration that allocates the budget for a project.

Defining the Work Shift Management system actors, it is necessary to mention that an actor is what an Actor in the framework of Unified Modelling Language (UML). Basically, an actor is a defined role that interacts with the system. In the case of the Work Shift Manager system, there can be two actors defined.

- **Admin**

The user with the role of "Admin" in the system is usually a person on the Manager job position who has extended permissions that allow along with ordinary manager's rights

to also define users' permissions, create employee groups, customize the application, determine the minimum and maximum length of the work shift, etc.

- **User**

The user with the role of "User" in the system is generally a person on an Employee job position who has standard permissions that allow reviewing, download, or print out work shifts plan if needed. As well as send a request to Manager in case if the work shift plan needs to be edited or shift change needs to be undertaken.

- **Core HRIS** (external system)

The external system SAP SuccessFactors allows to access the Work Shift Management Application, define the users' role-based permission, store the data, and deliver notifications to the users.

5.2.5 FURPS +

To structure identified previously functional requirements as well as add essential non-functional requirements, the author of the current thesis, based on the *FURPS+* technique, has provided a table that consists of a well-structured set of functional and non-functional requirements related to the Work Shift Management system. Among them is functionality, usability, reliability, performance, supportability, and additionally, under the "+" acronym are possible constraints that can be defined for design, user interface, etc. [32].

Table 9 – FYRPS (+), (created by the author).

Functionality	• To create/edit/delete/ a work shift plan for subordinates on behalf of Admin (Manager). • To review/export/report/reuse/copy/drag and drop existing work shift plan on behalf of Admin (Manager). • To great/edit/delete groups on behalf of Admin (Manager). • Optionally, the Work Shift Management system should allow creating vacation plan for the department or a group of employees.

	• To review, download, print a work shift plan on behalf of User (Employee). • User (Employee) should have an option to send a change request to the Admin (Manager) change request and Admin (Manager) should be able to reply. • User (Employee) should have an option to report worked time and Admin (Manager) should be able to approve/decline.
Usability	• UI must be simple, intuitive, ergonomic, and user-oriented. • Users must be informed of status and results.
Reliability	• Service recovery time: 4 hours. • Maximum acceptable data loss is 1 hour.
Performance	• User interface response: max 2 sec. • Number of transaction: 50 trans/per sec. • Concurrent users: average 50.
Supportability	• Application should be designed to be able for building up additional system functionality. • Application should support EE, LV, LT special characters. • Application should be *GDPR* compliant.
"+"	• Accessing into the Work Shift Planning system must be provided through the SAP SuccessFactors system with the same Username and Password. • The Work Shift Management system must be embedded in the SAP SuccessFactors Fiori user interface. • The access into the Work Shift Management system must be provided directly from his or her SAP SuccessFactors *EC* Home Page through the built-in tile. • The graphical user interface (GUI) of the system must be usable on screens that support at least 1920x1080 or higher resolution. • System interface core language must be English.

	• To define the Work Shift Management application users' permissions must be provided through Manage Role-Based Permission Access settings in SAP SuccessFactors.

5.2.6 User Stories

The user story itself can be named as a bridge between the customer's requirements and the development team that need to build a system based on these requirements. However, the requirements defined by a user are not always helpful for the development team, especially in terms of special technical specifications, such as security, infrastructure, etc., since the user is not always familiar with these aspects. So, the question becomes: how is it possible to improve this situation? One of the possible answers can be the user story. While standard requirement focuses primarily on functionality, the user story put attention on the experience. In other words, answers the question of what the person using the system wants to be able to do. The user story is usually written out in one or a couple of sentences using the language understandable by a user who is reading it. For instance, as a/an Admin, I want to review a work shift plan so that I can be sure that the work shift plan is correct [33]. Further, based on obtained and structured requirements, the following list of user stories was created:

1. As an Admin, I want to create a work shift plan so that I can plan workforce time.
2. As an Admin, I want to edit a work shift plan so that I can manage necessary changes in the existing work shift plan.
3. As an Admin, I want to delete a work shift plan so that I can remove incorrect or incomplete work shift plans.
4. As an Admin, I want to review a work shift plan so that I can be sure that the work shift plan is correct.
5. As an Admin, I want to create a report so that I can export the calculate of hours planned for the following months.
6. As an Admin, I want to reuse previously made up work shift plan so that I can manage my task more efficiently.

7. As an Admin, I want to create necessary groups so that I can assign a work shift plan to a group of users.

8. As an Admin, I want to reply to user requests so that I can give feedback, both improve or decline.

9. As an Admin, I want to confirm reported by employee working time so I can initiate a salary calculation process.

10. As an Admin, I want to reply to user request so I can manage the work shift plan changing process.

11. As a User, I want to review my work shift plan so that I can see view my work schedule.

12. As a User, I want to download my work shift plan so that I can accesses my work schedule directly from my device.

13. As a User, I want to print my work shift plan so that I can have my work schedule with me on the paper.

14. As a User, I want to send a request to my manager so that I can initiate a work shift plan change if needed.

15. As a User, I want to report my work time so that I can ensure the correctness of data for further salary calculation.

16. As a Customer, I want to be sure that the system is *GDPR* complies so that I can ensure that the company complies with a regulation.

5.2.7 Possible Work Shift Management System Definition

At this stage, based on all obtained, analyzed, and defined data, it is time to put different pieces together and explain the future WSM system concept. Thus, we are dealing with the Work Shift Management tool that will be created as the extension for the SAP SuccessFactors system using its database and business logic. The designing WSM extension will be accessible through the core HRIS, and its UI will be embedded into the SAP SuccessFactors UI using the user's Home Page as an entering point to the WSM system through the build-in special tile. The Work Shift Management tool will be

synchronized with both time management modules of SAP SuccessFactors Employee Central application as well. As the designing Work Shift Management tool at least on this stage, is not an independent system and cannot be used without the deployment of core HRIS, it will in demand of potential customers as well as existing customers using SAP SuccessFactors around the globe, according to the plan. As was written above, the possible delivery channel of the creating WSM tool is an internal SAP App Centers – the places where customers and partners seeking for a workable solution that is able to cover the gaps in different blocks of their SAP SuccessFactors systems. Finally, the Work Shift Management tool will be used for company Prominion OÜ internal use, generally for testing and working on new system functionality development.

5.2.8 Project Scope Definition

Determining the Work Shift Management extension development project scope, it is important to note that on this stage, all initial critical steps to define the scope of a project effectively were already undertaking. Among them, identifying the project needs, confirmation of the project's objectives and goals, setting the functionalities required for the developing system. However, some of the project scope necessary steps were mist so far and need to be taken into consideration, including a budget, time, and resources. It will not be superfluous to communicate the team better-articulated objectives and goals that they understand clearly. Based on that, the author will define the scope of the project as following [34]:

1. Identify the project needs. The minimum viable product (MVP) of Work Shift Management extension should be created throughout the determined in the project time framework; in other words, the WSM tool should be useful enough for offering it to the potential customer to obtain the data regarding what people actually think, feel and which feedback give using the developed system [35].

2. Confirm the objectives and goals of the project. The primary objective of the project is creating of extension for SAP SuccessFactors Employee Central Time Sheet module that allows managing work shift plans on behalf of the manager, More details related to this step can be found in chapter 5.2.1 ("Vision and Objectives") of current master's thesis.

3. Description of the necessary features and functionality as a next step can be found in the following chapters 5.1.4, 5.2.5, and 5.2.6 of the current master's thesis.

4. The group of steps related to budget, time, and resources was combined into one particular document named "Project costs and statement" that is represented in Attachment 13. According to this document calculation the initial project costs (41 580 €) made throughout the software development period, operation costs (60 480 €) based on the 12 months calculation, and infrastructure costs (438 €) similarly based on 12 months calculation can be covered by one external pilot project and one bigger won tender in next 12 months. Moreover, the profit in 60 192,64 € will be achieved in the same 12 months period according to this calculation. It is important to emphasize here that this calculation doesn't take into account the additional cost of a possible developing environments and tools. In the first place, these expenses, if they occur, will be covered by other funds as these tools can be used for other projects too. Later, named costs will be split between all projects and added to the expenses related to the Work Shift Management software maintenance costs.

   In conclusion, the project seems reasonably optimistic; even if something goes not as planned, there is always the possibility to switch previously booked for a system supporting purposes people to other projects and cut the operational costs with this step. Development costs will be covered with next system implementation or even through a deal with customers or partners via SAP App Center. According to the plan within three months from the start, the stakeholders want to get a minimum viable product. As was written above, the Work Shift Management extension will be developed in house. There will be four people in the team, and according to plan, each of the team members to his primary role will take on an additional one. This approach helps to eliminate downtime and avoid the involvement of other external specialists.

5.3 Ideate – Challenge Assumptions and Create Ideas.

During the previous two stages, the author of the current thesis has found out the needs of potential customers and company Prominion OÜ internal users' requirements in the Empathise stage and has analyzed and structured them in the Define stage. [26]. In the

following Ideate stage, the author visualizes the future Work Shift Management system, providing all essential elements needed for building up the WSM application final concept. Among them, visual representation of the future Work Shift Management tool through the providing of the low-fidelity wireframe as well designing of necessary IT models and architecture and finally, providing a list of system possible functionalities and features that can be built up in the future.

5.3.1 Defining Use Cases

A use case (UC) is one of the approaches used in system analysis to identify and structure the system requirements. The use case is a suggested order of interactions between the user and software and possibly other systems in a specific environment and related to a specific objective. The use cases can be applied throughout software development several stages; structured use case documents can help the development team to predict or notice at early stage errors so they can be resolved. Every use case consists of three essential elements, including [37, 38]:

- The actor (s)
- The goal
- The system

Further, the author writes one most essential use case in detail, such as work shift plan creation on behalf of the manager. As a next step, the use case diagram will be created using other use cases set in logical sequence; for this purpose, the author uses a unified modeling language (UML) through the free software service (draw.io).

Table 10 – Use case detailed description [38].

Use case name	**Work shift plan creation**
ID	UC-2.
Rational	The application displays calendar that allows the admin (manager) to review and select a range of necessary dates and associate them with groups of users (employees) and/or specific users (employees).
Actors	Admins, Users, HRIS (external system).

Preconditions	The admin is logged into the core HRIS. Then admin navigates to SFSF Home Page and selects the Work Shift Management tool tile and clicking on it opens the WSM application.
Postconditions	The system generates the notification for the user.
Basic Course	1. The admin selects the set of dates in a way that ensures the user a certain amount of working time. 2. The admin associates previously defined working time with a group of users or specific users. 3. The admin confirms the saving of the work shift plan.
Alternative Paths	1. The admin selects the set of dates in a way that ensures the user a certain amount of working time. 2. The admin associates previously defined working time with a group of users or specific users. 3. The admin confirms the saving of the work shift plan. 4. The system error occurs on the display, informing that specific user is not active in the system. 5. The admin sending a note to HR-manager to find out more details regarding this accident (this step takes place in core HRIS).

Below the Work Shift Management application, the main use case (UC-2: Work shift plan creation) is represented as a process using free software service the Bizagi (Modeler Online).

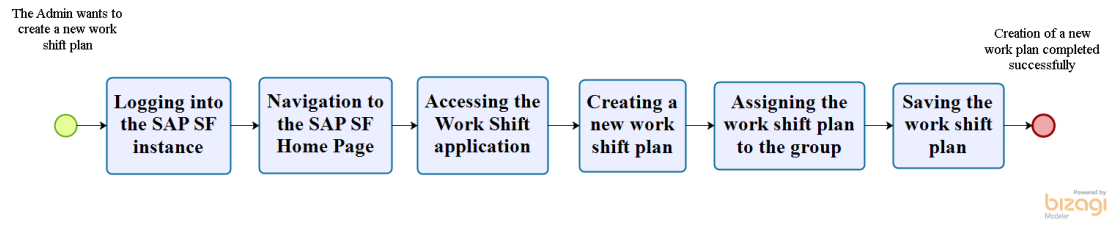


Figure 16 – UC-2: Work shift plan creation, (designed by the author).

Use Case Model

In this section, the author displays through the use cases modeling a certain sequence of interactions between actors (Admin/User) of the Work Shift Management system and external core HRIS. Along with that, the author unlike the detailed description of UC-2

used in the previous section provides a brief description of represented the use cases in use case model.

Use case model related to Admin:

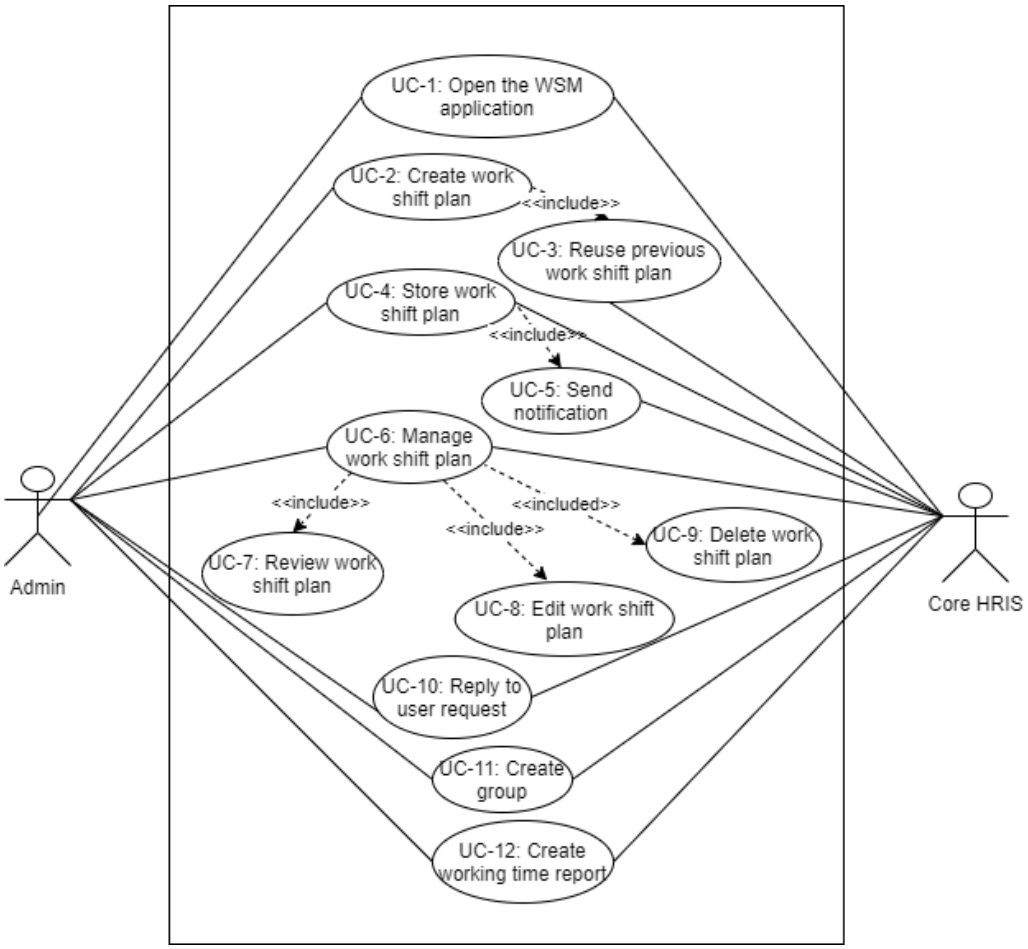


Figure 17 - Use cases related to Admin, (designed by the author).

Use cases related to Admin:

UC-1: Open the WSM application:

The admin logs in to the SAP SuccessFactors instance and navigates to the Home Page. As a next step, he or she seeks appropriate WSM tile and clicks on it accessing the Work Shift Planning application.

UC-2: Create work shift plan:

Please see section 5.3.1 above.

UC-3: Reuse previous work shift plan:

The admin seeks a previously created work shift plan depending on needs. The WSM system requests the HRIS database and pulls the necessary data and displays it through the WSM application UI. The admin reuses previously created work shift plan updating necessary data and confirms the saving of the updated work shift plan.

UC-4: Save work shift plan:

After the admin has confirmed the saving of the work shift plan, the WSM system sends the data into the HRIS database where it saves.

UC-5: Send notification:

Since data is saved in the HRIS database. Next, the system internal notification and additional e-mail are sent to the user.

UC-6: Manage work shift plan:

The admin seeks for specific work shift plan to manage it. The WSM system requests the HRIS database and pulls the necessary data and displays it through the WSM application UI. The admin undertakes necessary operations with a work shift plan.

UC-7: Review work shift plan:

The admin seeks for specific work shift plan and reviews it.

UC-8: Edit work shift plan:

The admin seeks for specific work shift plan and edits it.

UC-9: Delete work shift plan:

The admin seeks for specific work shift plan and deletes it.

UC-10: Reply to user request:

The admin replies to the request received from the user. The WSM system triggers the appropriate replying process in HRIS. Next, the system internal notification and additional e-mail are sent to the user.

UC-11: Create group:

The admin navigates to the settings menu and selects to create a group of employees based on the needs. The data saved in the core HRIS database.

UC-12: Create working time report:

The admin navigates to the reporting menu and selects to create a needed report based on the needs. The data saved in the core HRIS database.

Use case model related to User:

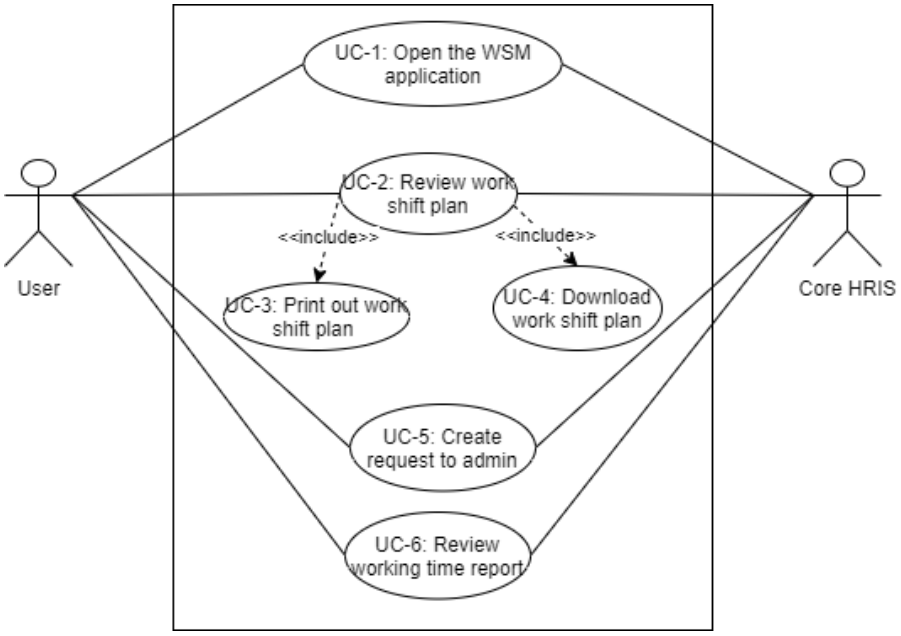


Figure 18 - Use cases related to User, (designed by the author).

Use cases related to User:

UC-1: Open the WSM application:

The user logs in to the SAP SuccessFactors application and navigates to the Home Page. As a next step, he or she seeks appropriate WSM tile and clicks on it accessing the required Work Shift Planning application.

UC-2: Review work shift plan:

The user seeks for specific work shift plan. The WSM system requests the HRIS database and pulls the necessary data and displays it through the WSM application UI. Next, a user can review it.

UC-3: Print work shift plan:

The user seeks for specific work shift plan and prints it out.

UC-4: Download work shift plan:

The user seeks for specific work shift plan and downloads it.

UC-5: Create request to admin:

The user sends a request to the admin. The WSM system triggers the requesting process in HRIS. Next, the system internal notification and additional e-mail are sent to the admin.

UC-6: Review working time report:

The user navigates to the reporting menu and selects the working time report prepared by admin. The WSM system requests the HRIS database and pulls the necessary data and displays it through the WSM application UI. Now, a user can review the working time report.

5.3.2 Final Work Shift Management System Definition

Considering all previously obtained and analyzed aspects related to all types of requirements for the Work Shift Management tool and a visualization of how it can be possibly fulfilled put us to investigate project possible execution options. As was written above (in sections 5.2.5, 5.3.1, etc.) there is a variety of requirements that lead us to investigate more about capabilities of integrating future Work Shift Management tool with an SAP SuccessFactors core HR module and additionally to do that in a better, faster, less resource-intensive way. Among them are a). Accessing into the Work Shift Management application must go through the SAP SuccessFactors core HR system using the same user ID and password and along with that a single sign-on option. b). Despite the WSM tool must have its own user interface the Work Shift application must be embedded in the SAP SuccessFactors UI and give a user option access the WSM application directly from the SAP SFSF Home page by clicking on the built-in Work Shift application tile there on the Home Page. c). At this stage, the Work Shift Management system is not considered as an independent system but as an extension system to the core HRIS. In these conditions the WSM tool must have seamless access into the core HR module to exchange required data, use metadata framework and role-based permission

framework, and other essential functionality that support the main processes of the WSM tool, such as notification processing, notes delivery, etc. Thus, as was already written in section 5.2.7 the Work Shift Management extension cannot run independently without the deployment of core HRIS, however, the process of deployment and configuration of SAP SuccessFactors system will not be considered in the scope of current master's thesis.

5.3.3 Integration Technology for SAP SuccessFactors HCM Solution

Considering software integration capabilities supported by the SAP SuccessFactors HCM solution it is essential to note that there is various integration and extension options that can be used based on the specific scenario. Among them are:

- File Import/Export

  Employee Central has the build-in option to import/export all the necessary data using CSV format, such as a person, employee data, foundation data including MDF foundation data using Import and Export Data functionality. This manual process can be automated through the provided job-scheduler tool and *SFTP*. This approach can be used as a starting point to load initial data into the system but there are more advanced options provided by SAP SFSF that are displayed below [39].

- OData API

  Employee Central provides a comprehensive infrastructure for Odata and it perfectly suits the bigger integration project, especially in case of direct interaction with a custom UI. For instance, it can be used for extensions notably if there is a need to use core HRIS RBP framework and concurrent user access to build up its own UIs on top of Employee Central's one using an extension platform. Moreover, if there is a need to access the metadata framework in the core HRIS system or just contribute stored data for their replication in an external system, the Odata can be used too [39, 44].

- SFAPI API

  SFAPI basically stands for the *SOAP*-base API that supports all basic functions, such as create, read, update, and delete (CRUD) and can be used for reading and

writing data. This approach can be used if there is a need to retrieve SuccessFactors system data that is not in the framework of more capable Odata API or if there is a need for employee-specific field replication, in other words, some common operation [44].

- Intelligent Service

  Finally, there is available one more type of API supported by SAP SuccessFactors which is based on business events in the SAP SFSF system. The SAP SuccessFactors integration based on the HRIS event approach can be executed using standard *REST* or *SOAP* services. As soon as core HRIS triggers a specific event in the system, the associated services are called with data related to the particular change. Moreover, for this specific business events integration (in our case extension) approach, there is an option to develop such services through the SAP Cloud Platform [44].

To have a better visual overview of the SAP Cloud Platform and SAP Cloud Solution integration approach the author using draw.io (online diagram editor) service has provided a visual representation of the possible architectural relationship of these two entities.

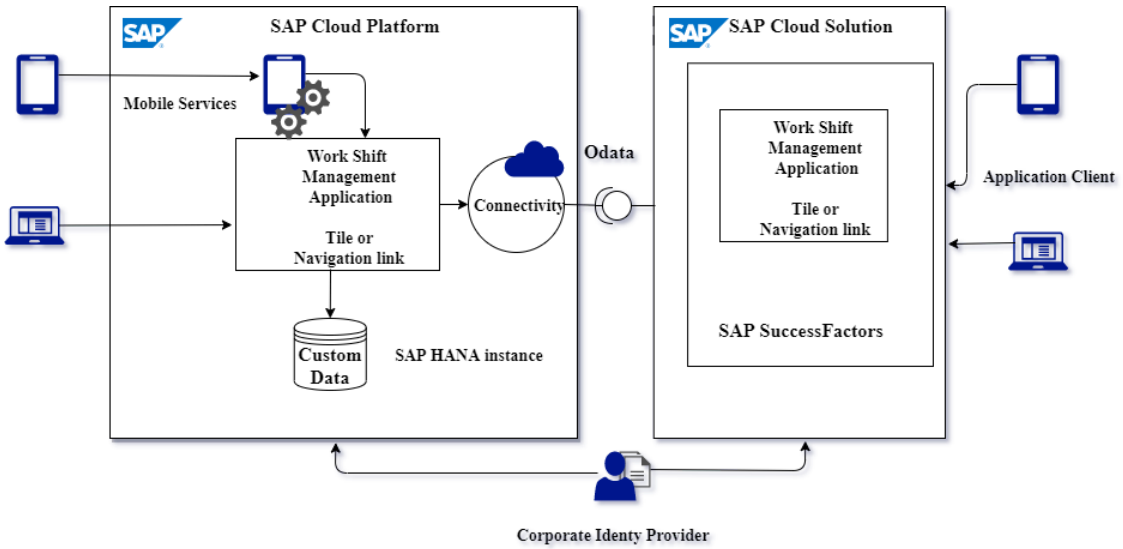


Figure 19 - SAP CP and SAP Cloud Solution integration model [44], (redesigned by the author)

5.3.4 WSM Application Development Technology Definition

Staying on the side of the better, faster, less resource-intensive, and keep it simple approach the SAP Cloud Platform (CP) was chosen as a possible technological foundation for further project implementation. SAP Cloud Platform is the enterprise business platform-as-a-service (PaaS) that provides extensive application development services and tools for clients and partners. Here are several benefits of using this method [44]:

- Automated activation of building services

  The system creates an SAP Cloud Platform extension account and provides access to the *WEB IDE* (application development tool) and subscribes both accounts to portal extension service.

- Development Environment

  SAP CP enables developers and partners to extend the SAP SuccessFactors HCM Suite existing applications by developing new applications on the top of existing system functionality using provided comprehensive development environment supporting the full software development life cycle [44].

- User Experience

  Using SAP Cloud Platform for developing and integrating extensions for SAP SuccessFactors HCM applications ensures software seamless building and integrating processes that evidently will stay unnoticed for end-users allowing them to use HRIS modules without any disruption throughout application developing, integration and upgrading processes [44].

- Application Container

  Since SAP Cloud Platform uses a PaaS model, providing all the necessary for application development processes hardware and software capabilities, it allows customers and partners not only to host their built applications on SAP CP but connect and manage them from anywhere and anytime, saving resources on IT infrastructure at the same time [44].

- Integrated Marketplace

The benefits of having integration with the SAP App Center are described in section 5.2.7 of the current master's thesis.

Moreover, SAP Cloud Platform allows building Java or HTML5 applications that can be synchronized with SAP SuccessFactors required MDF objects through the Odata API. It also enables using of the role-based permission framework to set specific permissions to certain roles as for any other SAP SuccessFactors module, its portlet, or user interface. Development environment of SAP Cloud Platform is closely linked to the SAP SuccessFactors system and use all the authentication and authorization capabilities of the SAP SuccessFactors. [44]. To have a better understanding of SAP Cloud Platform capabilities the author has provided using draw.io online editor a high-level architecture of the SAP Cloud Platform in Attachment 14.

5.3.5 Architecture Definition

Determining the architecture of the Work Shift Manager software the author relied mainly on the fact that the Work Shift Management application initially planned as an extension of existing SAP SuccessFactors Employee Central Time management module, that why the main focus is turned onto the wider architectural framework to represent how the WSM application might be not only built most efficiently but also embedded into the SAP SuccessFactors Employee Central module seamlessly. However, the author will start from the Work Shift Management extension high-level architecture. The architecture of the WSM application consists of three architectural layers and additional connectivity layer provided as following [44]:

- Presentation Layer/Front End UI

  The Work Shift Management solution uses the SAPUI5 to archive the mimic effect and make the WSM UI same as SAP SuccessFactors UI.

- Business Logic Layer

  Mainly provides service and security validation.

- Data Access Layer

Several options can be used here for storing data depending on storage needs, including SAP HANA and SAP ASE (relational databases) and unstructured data storage, based on document service. Additionally, SAP SuccessFactors internal MDF objects as a data storage can be used as well and in terms of the Work Shift Management initial version (MVP) SAP SFSF metadata framework will be used as a primary data storage option.

- Connectivity Layer

  This layer is used to get connected with the SAP SuccessFactors system. Later it can be also used to connect to other back end resources.

The Work Shift Management extension application's architecture is represented in the figure bellow.

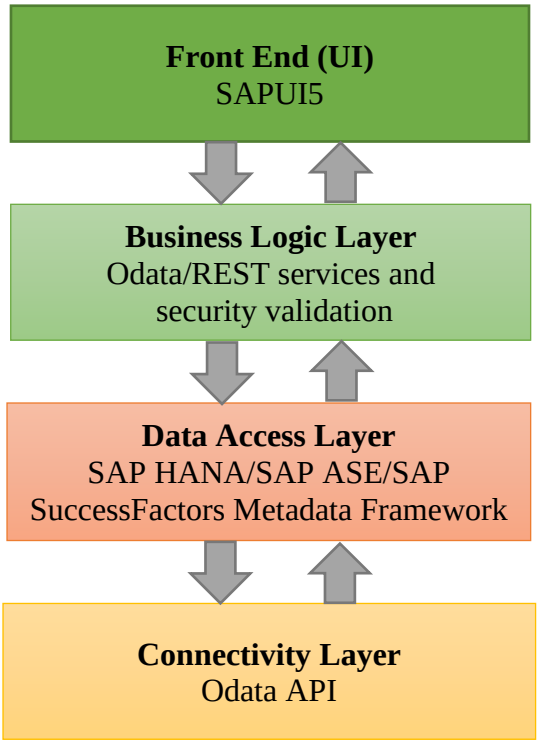


Figure 20 - Work Shift Management extension application high-level architecture [44], (redesigned by the author).

Taking into account that the SAP SuccessFactors metadata framework will be used as the application data layer for the initial version of the Work Shift extension application, the author of the current master's thesis provides a bit more details regarding the SAP SFSF MDF objects creation process. If it is needed, then using the SAP SuccessFactors

Employee Central metadata framework the developing team can create required objects and automatically deliver them to SAP Cloud Platform. Then, the needed application logic can be built on the top of these newly created generic objects. The initial process of creating a new generic object goes through the Configure Object Definition UI provided in the SAP SuccessFactors instance; where can be set object's necessary attributes such as field name and data type, the validations rules, etc. [45]. The example of the generic object's initial form is represented by the author in Attachment 15 (development instance).

As was written above in the header of the current section it is important to see a wider picture and represent the architectural model that can combine all related to the project systems and components. To achieve this the author has created using the draw.io the appropriate component diagram presented below.

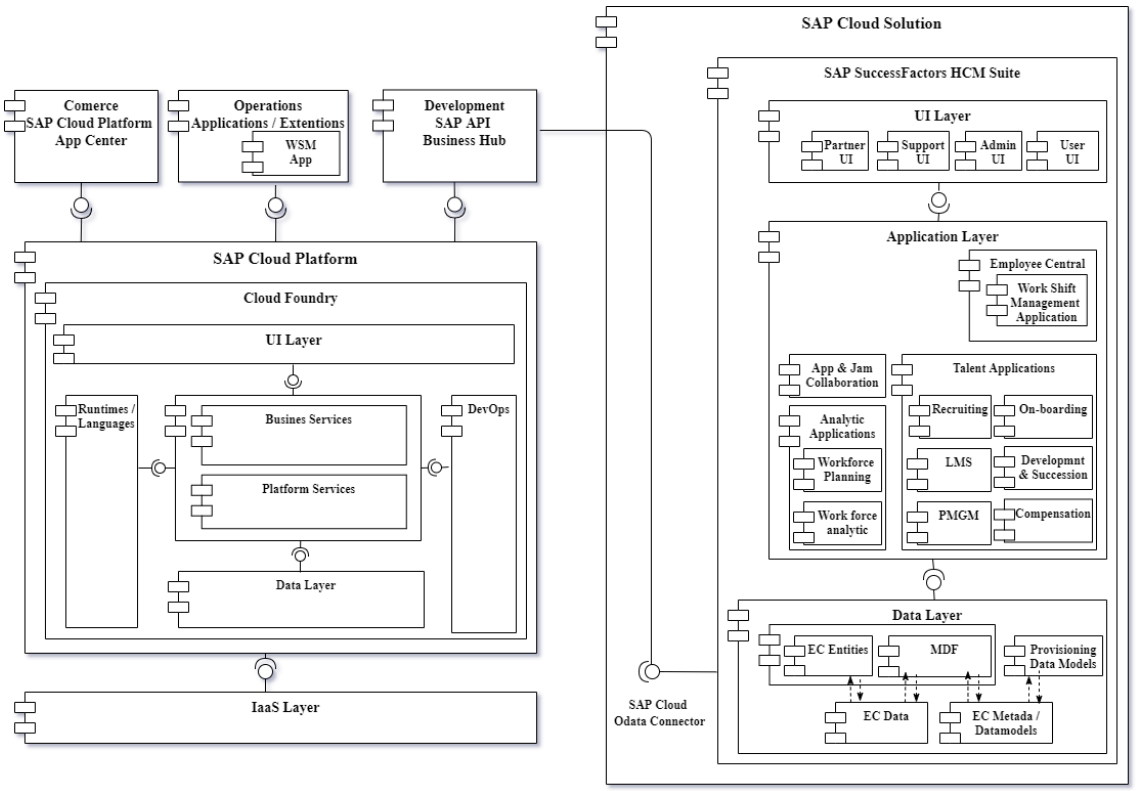


Figure 21 – SAP CP and SAP Solution Cloud component diagram, (designed by the author).

According to the figure above the Work Shift Management, extension application is built and hosted in the container provided by the SAP Cloud Platform developing services and integrated with the SAP SuccessFactors (SAP Cloud Solution/Product Cloud) through the Odata API. The Work Shift Management tool UI is built-in in the SAP SFSF UI.

Additionally, single sign-on, role-based permissions, metadata framework, etc. are also provided through the integration of the different layers between two different clouds.

5.3.6 Work Shift Management Application Wireframe

Considering the phase of creating the Work Shift Management extension application wireframe; in other words, its visual low-fidelity representation the author pursued a goal to provide an idea of how the future product may look like. Working on the application wireframe the author tried to accommodate all previously identified and set requirements to keep the representation of the WSM software as close as possible to its final version, of course only from visual idea perspectives. As a result, four different views were created, included the SAP SuccessFactors login page, the SAP SFSF Home Page, a work shift plan creation page view, and a work shift plan review. The first view is the SAP SFSF login page provided below.

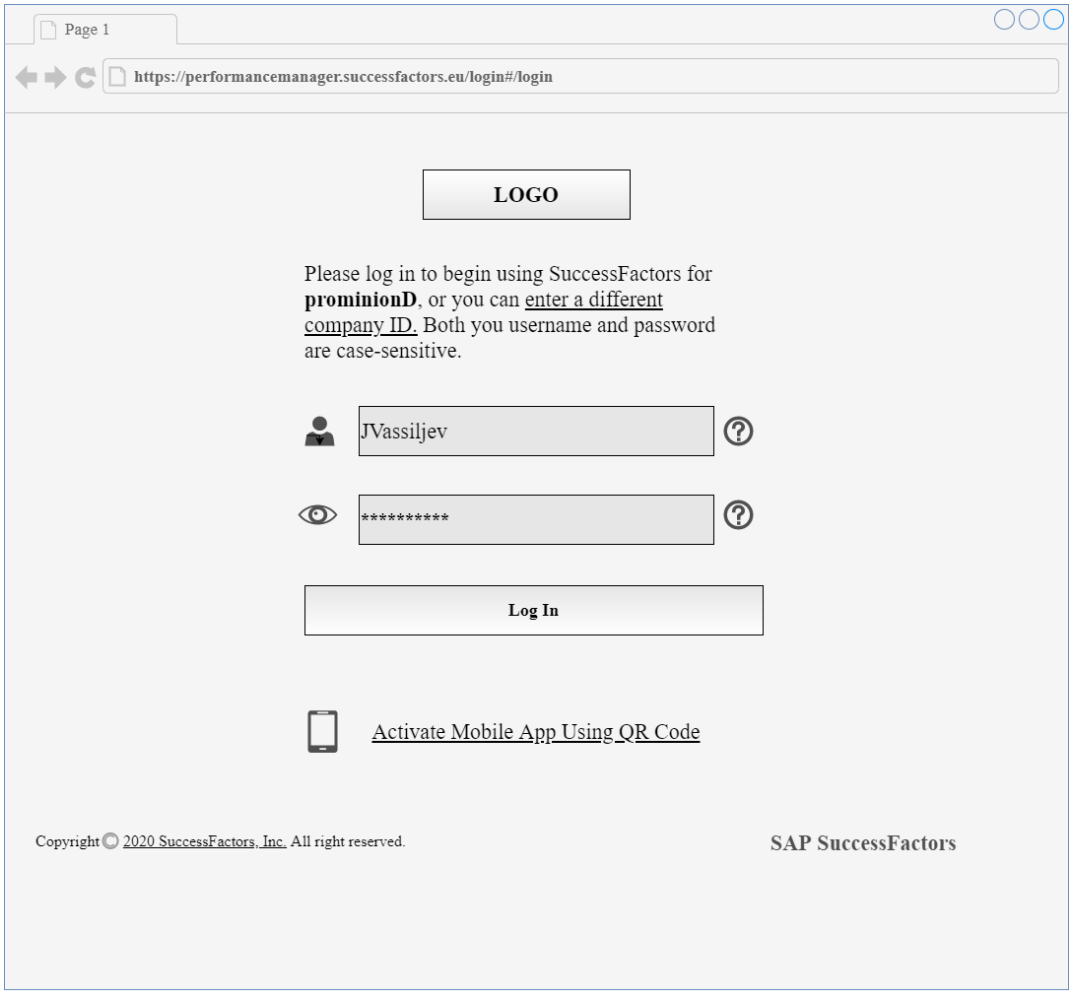


Figure 22 - SAP SuccessFactors application Login Page, (designed by the author).

As we can in the figure above the scenario of accessing the Work Shift Management application by the user starting from the logging in the SAP SuccessFactors system using the same user ID and password through the single sign-on option as was determined during the system requirements defining stage and provided through the integration between SAP Cloud Platform where WSM application is hosted and SAP SuccessFactors (Product Cloud) where named extension software is used by the end-user.

The next figure represents the core HRIS Home Page view and the Work Shift Management application tile that is embedded in the SAP SuccessFactors UI that allows providing a seamless picture for an end-user.

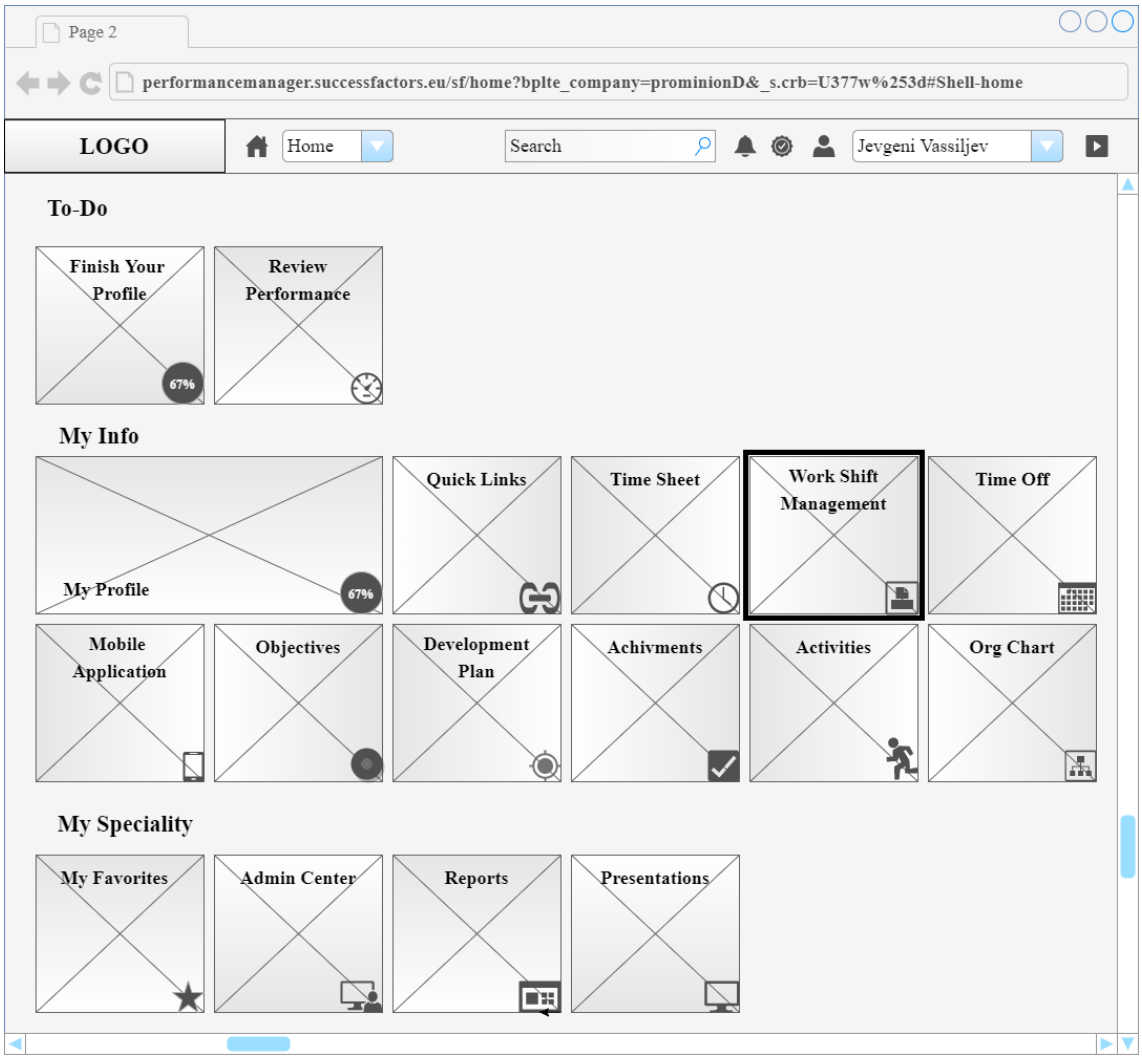


Figure 23 - The WSM application tile embedded into the EC UI, (designed by the author).

As we can see in the figure, using the benefits of SAP Cloud Platform the Work Shift Management application tile is looks like exactly as typical core HRIS internal element; in other words SAP CP technology allows the extension application using specific themes

and templates mimic the SAP SuccessFactors UI. The Work Shift Management application is registered as SAP SuccessFactors Home Page tile as well [44].

The figure below represents a work shift plan creation page managed by the administrator (manager according to organizational hierarchy).

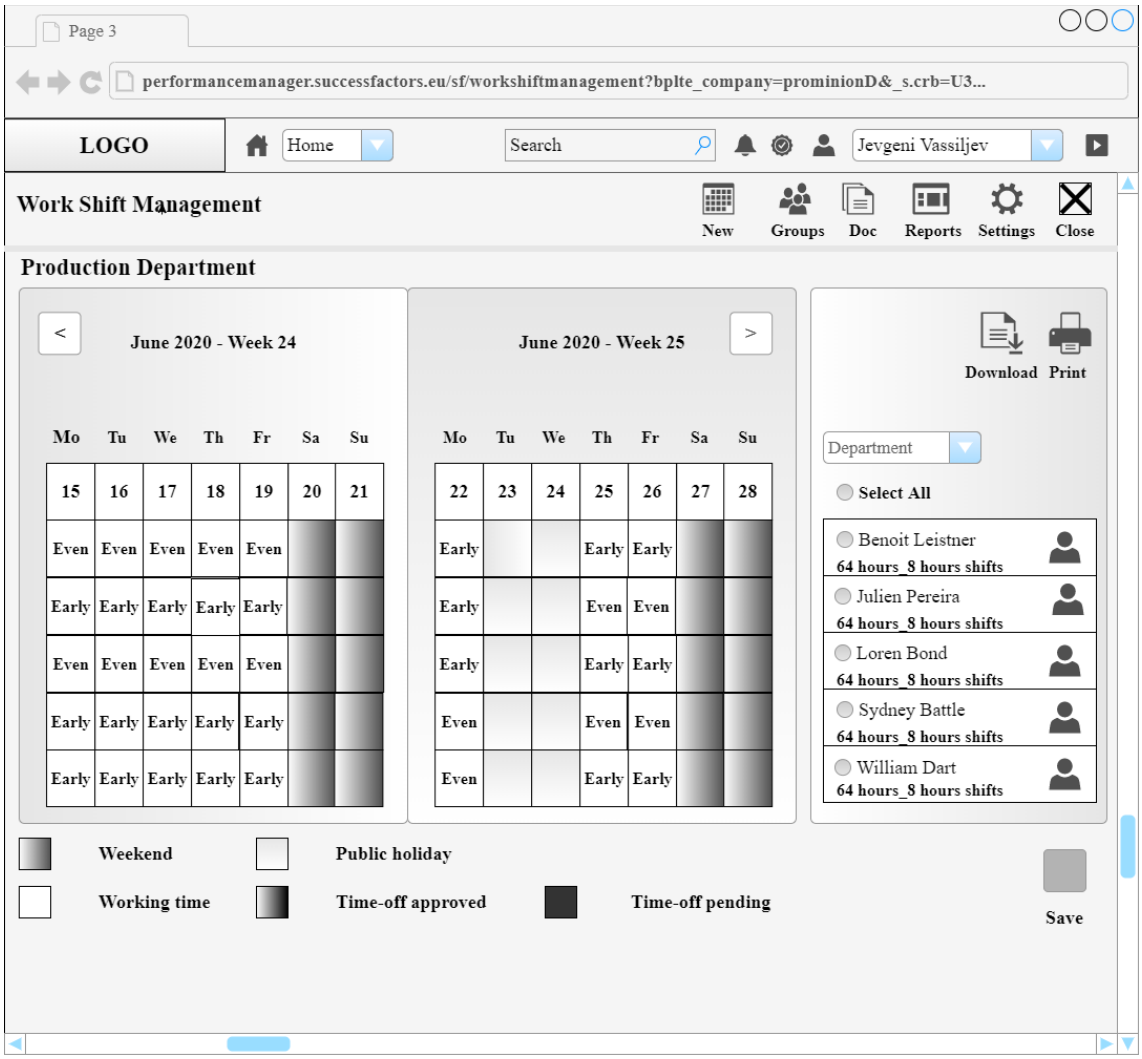


Figure 24 - The WSM application Admin view, (designed by the author).

The set of options and settings is intuitive. The User-administrator can create a new work shift plan and assign it to the specific employee or certain group. The Administrator can use previously created plans as well as manage (review, edit, delete) existing one. He or she can create a necessary croup of employees, use the reporting center, and create custom shifts as needed.

The next figure represents the user (employee according to organizational hierarchy) work shift plan review page.

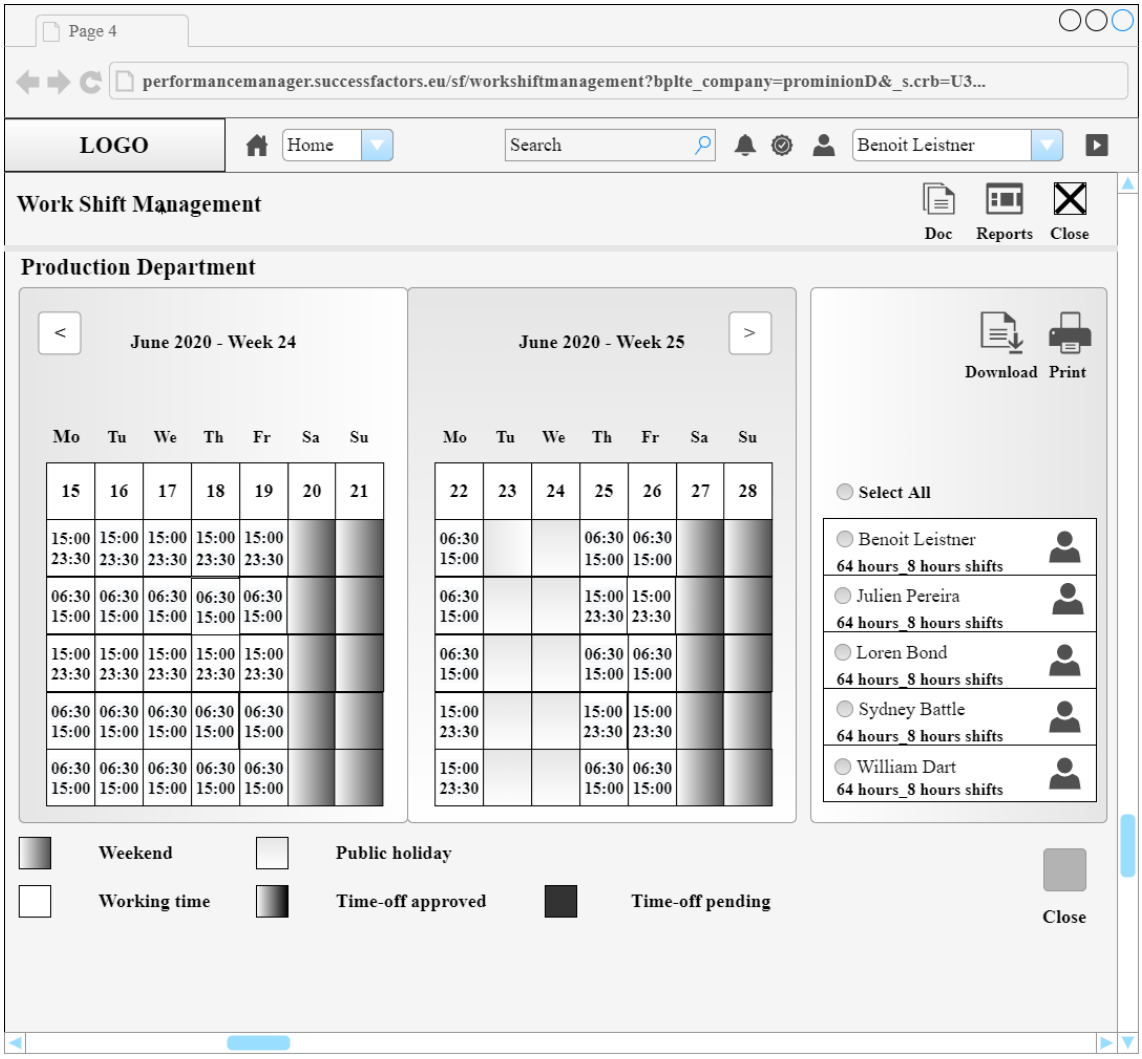


Figure 25 - The WSM application User view, (designed by the author).

The UI is similar to the Administrator UI but has a limited set of options and a different calendar view that provides the timetable. The user is also able to download or print out a timetable if needed. A simple working time report is also provided for a user.

Summarised the outputs of the Work Shift Management extension application wireframe creation phase, it is necessary to emphasize that all previously set requirements related to the WSM application UI were taken into account. Thus, the UI of the WSM extension tool is simple and intuitive. It is embedded in SAP SuccessFactors instance UI and its starting tile is built-in into SAP SFSF Home elements.

5.3.7 Scope for Future Development

Considering the pathway that was done up to this point it is crucial to highlight that any IT product development is a long-term and dynamic process. Even during the designing process lots of details can be changed several times and for sure the continuous development process should and will be continued throughout a product whole life circle, and the Work Shift Management application is not an exception. Moreover, there were discovered some additional challenges throughout the empathize stage, and before that during analyzing the requirements of the tenders that need to be overcome and be included in the system developing scope too. At this stage defining the possible future projects, it is essential to spite them into the two different frameworks, first is related to the Work Shift Management application, and second is related to the core HRIS - SAP SuccessFactors.

1. **Work Shift Management Application**

- Create the Work Shift Management application prototype

  As was already described in section 5.2.8 of the current master's thesis the final output of the Work Shift Management application development project is creating the minimum viable product. However, the author believes that before that it is necessary to invest some afford into the creation of at least the mid-fidelity design model of the final UI; in other words final WHS application the UI prototype to test it with a potential customer user, confirm the feasibility and to make necessary changes before the final stage.

- Recommendation to the further WSM application development

  According to the author opinion as soon as the Work Shift Management application is built it is necessary to support and maintain the basic MVP version offering it to the potential customers who are already using or going to use the SAP SuccessFactors HCM solution delivering the WSM extension through the all possible channels including the SAP Cloud Platform App Center. As the risk of duplicating functionality from SAP, SuccessFactors vendor is quite high further Work Shift Management application development might be released in the

framework of some bigger SAP SuccessFactors implementation project. This the best way of continuous product development according to the author's opinion.

2. SAP SuccessFactors HCM Suite

- Integration with a Document Management System

  As was written above in the section 5.1.4 during the team brainstorming session was concluded that one of the best options to expand existing Document Generation tool is to integrate core HRIS with a third-party document management solution that already has all required capabilities, such as embedded digital signature modules that supports all Baltic countries' digital signature format, provides a decent document storage capability and provides all the basic processes related to the document management best practices. One such partner is a Lithuanian company DocLogix that offers the Document and Process Management System in all Baltic countries and along with that their solution provides all necessary functionality and features that can meet all previously unidentified business needs of the potential' customers and the company Prominion OÜ internal requirements.

- Localization of the core HRIS

- Localization of the SAP SuccessFactors Payroll system

  First of all, these two topics can be combined into one and the reason for this is that to bring the progress related to these topics closer it is crucial to join forces with other partners who have the same issue and together stating to negotiate own interest with regional management of SAP SE.

  Despite the large size of the SAP organization and quite small Baltic state market, in the end namely people run the organization, and generally, the negotiations go much better if a large project is brought to the table. In this case, the collaboration between partners becomes even more important as such an approach allows us to participate even in large projects and thereby to bring attention to the problem of systems localization.

Summary

The foundation of the current master's thesis was a desire of the company Prominion OÜ of launching the cloud-based human capital management software - SAP SuccessFactors into the Estonian market. Standing on that, the primary goal of the master's thesis was to analyze the SAP SuccessFactors solution core modules functionality and based on that, to propose the existing HRIS possible enhancement as well as its wireframe (low-fidelity representation) and finally, to set a list of the possible future enhancements.

Throughout the master's thesis writing process the author has provided a detailed analysis of the whole SAP SuccessFactors HCM product family including an overview of the core functional and technical aspects, applications architecture, and their interaction and description of the system security layer. Moreover, during the writing of the feasibility study chapter, the author has considered all of the project's relevant aspects, such as economic, technical, legal, and other, resources-based factors to make sure that the project is viable to undertake. Further, considering different designing methodologies the author has defined the design thinking method as the most suitable approach for the project implementation.

The main output of the current master's thesis is designing the Work Shift Management application that enhances the core SAP SuccessFactors HCM solution, covering previously identified requirements of scheduling the work shift plan for the employees on the behalf of their manager. Throughout the Work Shift Management application designing process the author has provided the necessary high-level architecture to represent, in his opinion best approach of the application developing and its further integration as well as maintaining throughout the software whole life cycle, has created a wireframe (low-fidelity visual representation) of the future enhancement and finally, has proposed a list of the possible future enhancements.

Looking beyond the master's thesis horizon it is important to emphasize that the value of the cloud-based SAP SuccessFactors solution reinforced with Work Shift Management application almost impossible to overestimate. The ever-increasing trend of remote work strengthened by the risk of a new wave of the Covid-19 pandemic in the following fall makes the project of launching the cloud-based HCM solution extended with WSM even more valuable as it allows organizations effectively manage their people even remotely.

Kokkuvõte

Käesoleva magistritöö alus oli ettevõtte Prominion OÜ soov käivitada Eesti turul pilvepõhine personalihalduse tarkvara - SAP SuccessFactors. Selle põhjal on magistritöö põhieesmärk analüüsida SAP SuccessFactors pilvelahenduse peamiste moodulite funktsionaalsust ja pakkuda olemasolevale personalijuhtimise infotehnoloogiale võimalikku täiustust, samuti selle veebimaketti (madala täpsusega esitlus) ning lõpuks panna paika võimalike edaspidiste täiustuste loetelu.

Magistritöös on autor esitanud kogu SAP SuccessFactors tööjõu haldamise tooteperekonna üksikasjaliku analüüsi, sealhulgas ülevaate peamistest funktsionaalsetest ja tehnilistest aspektidest, rakenduste arhitektuurist ja nende koostoimest ning süsteemi turvakihi kirjeldusest. Lisaks on autor teostatavusuuringute peatüki kirjutamisel projekti teostatavuses veendumiseks kaalunud projekti kõiki olulisi aspekte, nagu majanduslikke, tehnilisi, juriidilisi ja ka muid ressursipõhiseid tegureid. Lisaks on autor erinevaid projekteerimismetoodikaid arvesse võttes määranud projekti elluviimiseks kõige sobivamaks lähenemisviisiks disainmõtlemise meetodi.

Käesoleva magistritöö peamine väljund on SAP SuccessFactors tööjõu haldamise põhilahendust täiustava rakenduse Work Shift Management kavandamine, mis hõlmab varem tuvastatud juhi poolseid töötajate vahetuste plaani kavandamise nõudeid. Kogu töötajate vahetuste juhtimise rakenduse kujundamise protsessi vältel on autor pakkunud vajalikku lahenduse kõrgetasemelist arhitektuuri mis esindab tema arvates rakenduse arendamise ja selle edasise integreerimise parimat lähenemisviisi, samuti selle hoidmist kogu tarkvara olelustsükli vältel, luues veebimaketi (madala täpsusega visuaalne esitlus) tulevastest lisaseadmetest ja pakkudes lõpuks välja võimalike edaspidiste täiustuste loendi.

Vaadates magistritööst kaugemale, on oluline rõhutada, et Work Shift Management rakendusega täiustatud pilvepõhise SAP SuccessFactors lahenduse väärtust on peaaegu võimatu ülehinnata. Järjest suurenev kaugtöö suundumus, mida tugevdab Covid-19 pandeemia uue laine oht järgmisel sügisel, muudab töövahetuse juhtimisega laiendatud pilvepõhise tööjõu haldamise lahenduse käivitamise projekti veelgi väärtuslikumaks, kuna see võimaldab organisatsioonidel oma inimesi isegi eemalt tõhusalt hallata.

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Appendix 1 - Employee Central and Other Modules

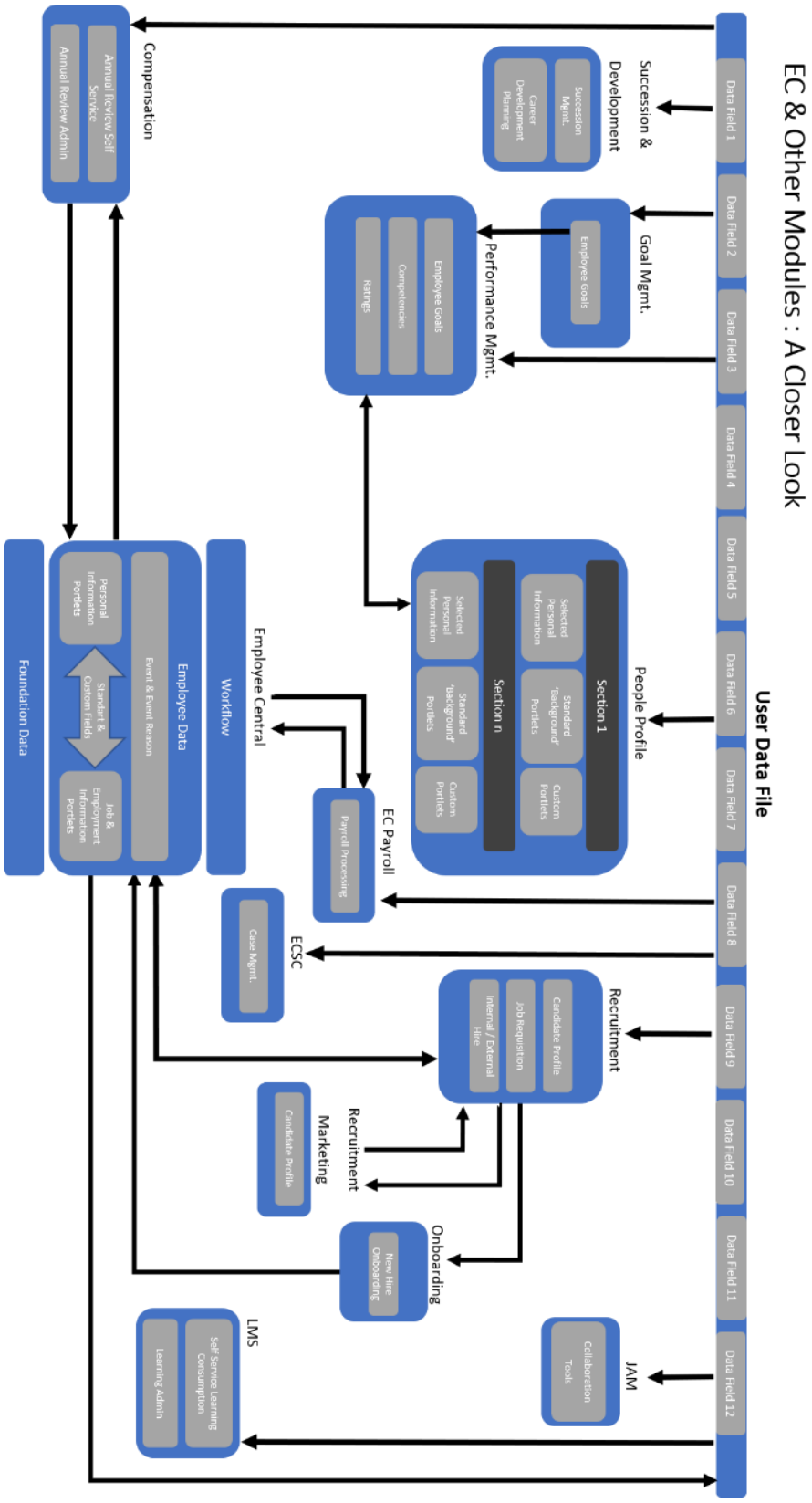

Figure 26 - Employee Central and other models [10].

Appendix 2 - Employee File

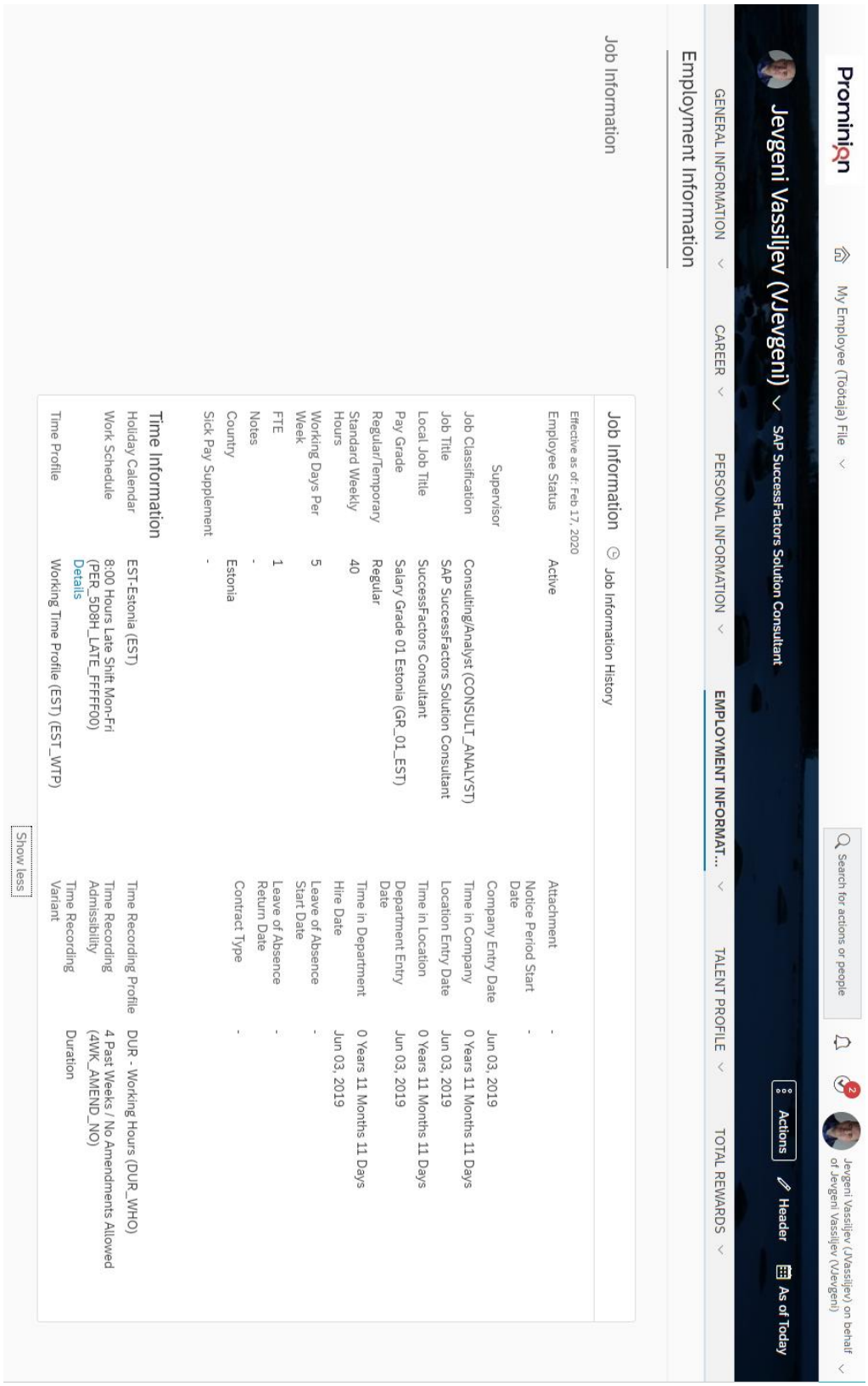

Figure 27 - Employee File, (created by the author).

Appendix 3 - Goal Plan Form

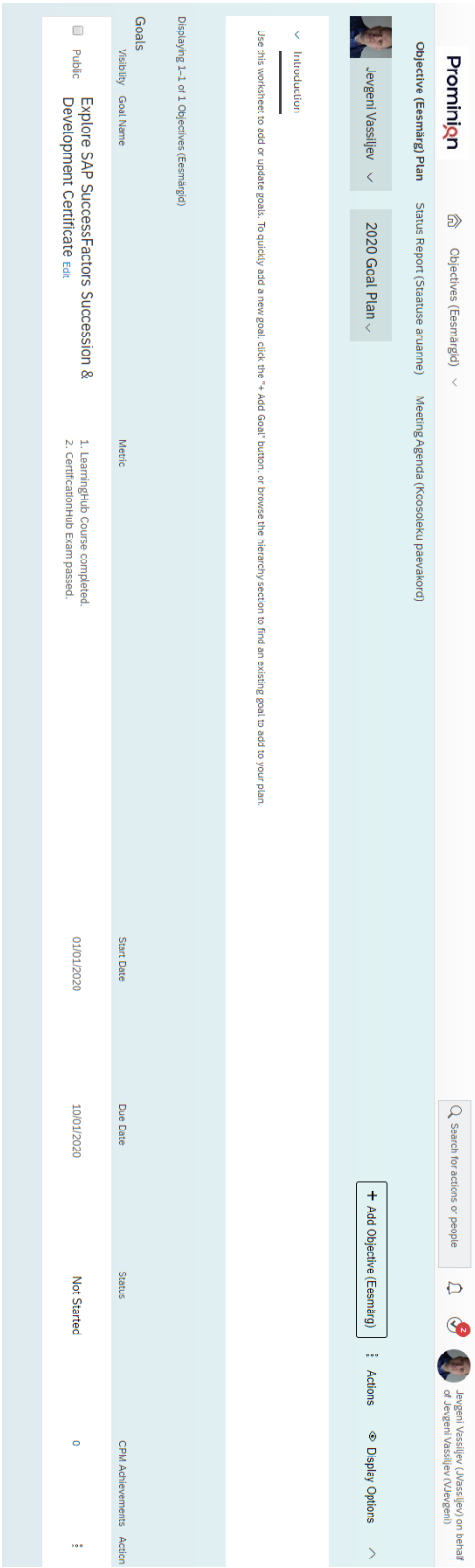

Figure 28 - Goal Plan form, (created by the author).

Appendix 4 - Career Development Plan Form

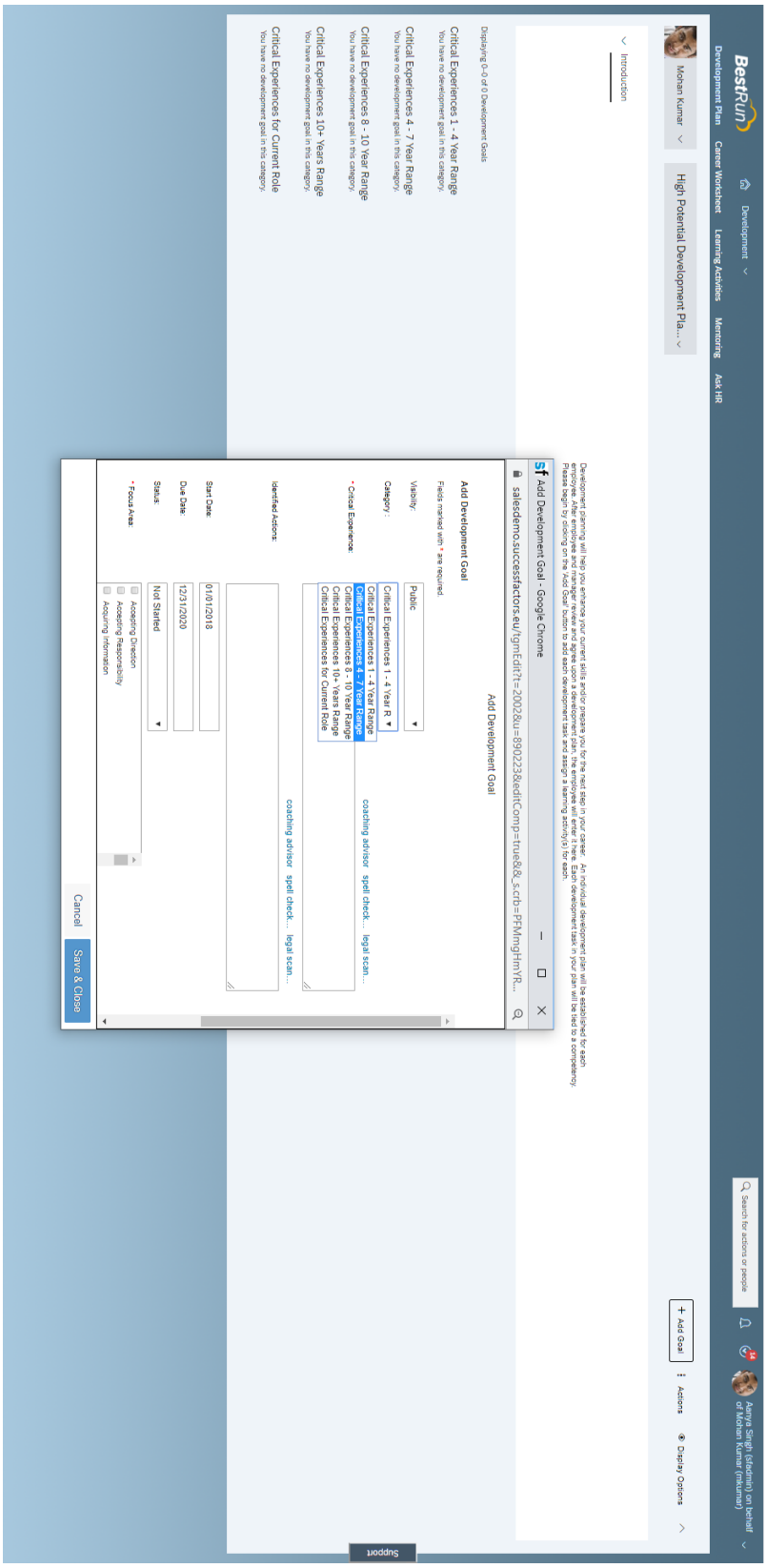

Figure 29 - Career Development Plan form, (created by the author).

Appendix 5 - Onboarding Dashboard 2.0

Figure 30 - Onboarding Dashboard 2.0, (created by the author).

Appendix 6 - Onboarding Dashboard 1.0

Figure 31 - On-boarding Dashboard 1.0, (created by the author).

Appendix 7 - Job Requisitions Page

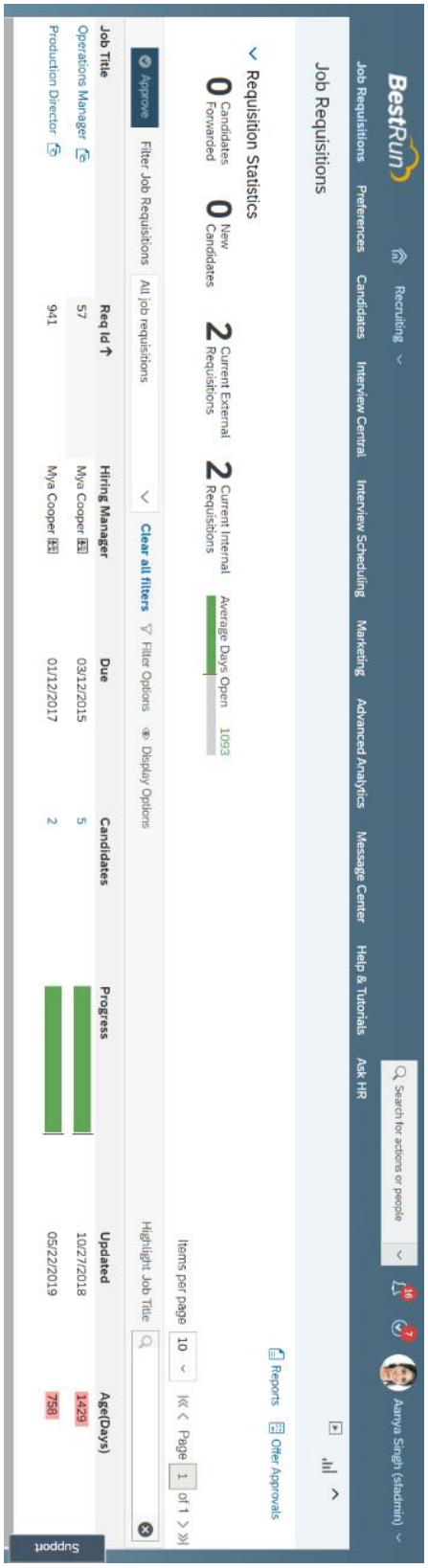

Figure 32 - Job Requisitions Page, (created by the author).

Appendix 8 - Annual Salary, Equity & Incentive Plan

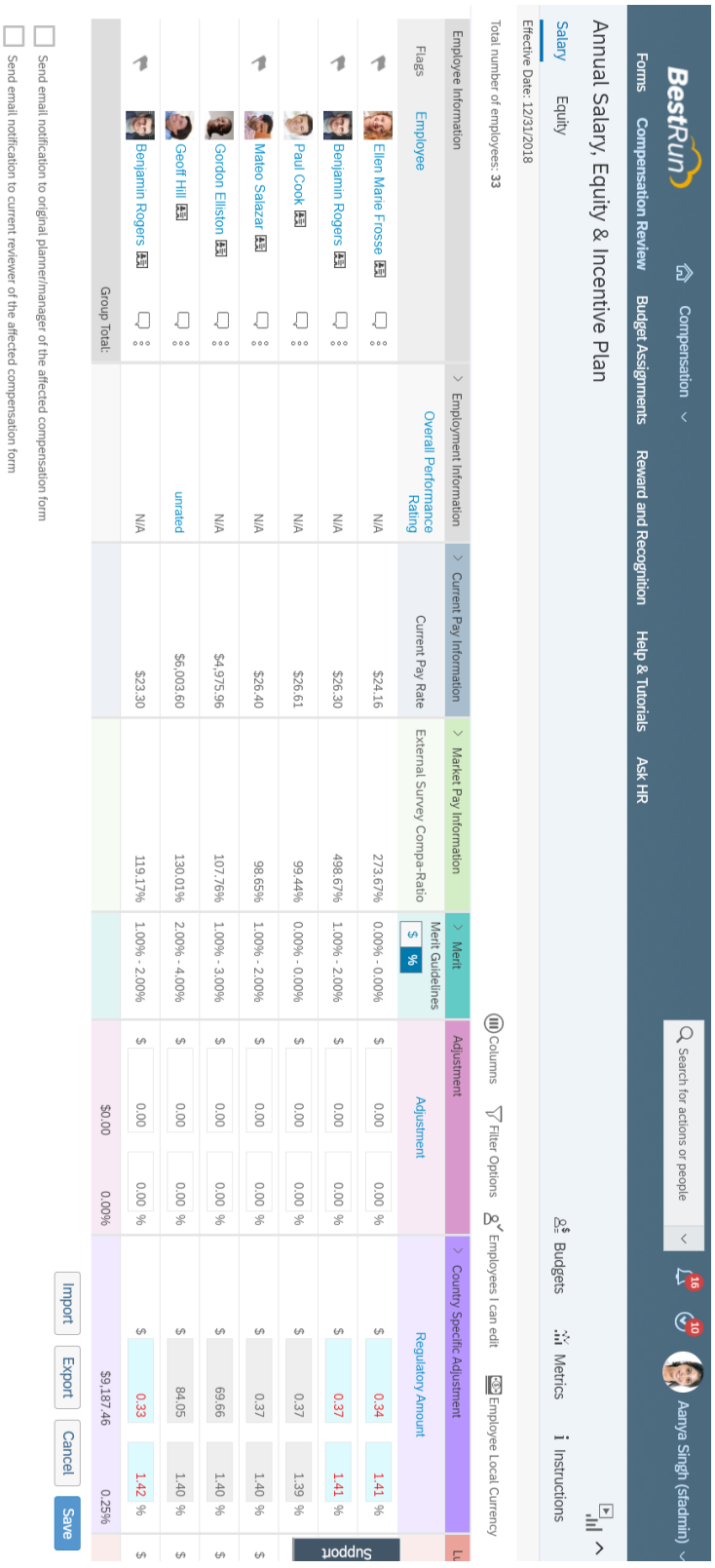

Figure 33 - Annual Salary, Equity & Incentive Plan form, (created by the author).

Appendix 9 - Succession Org Chart

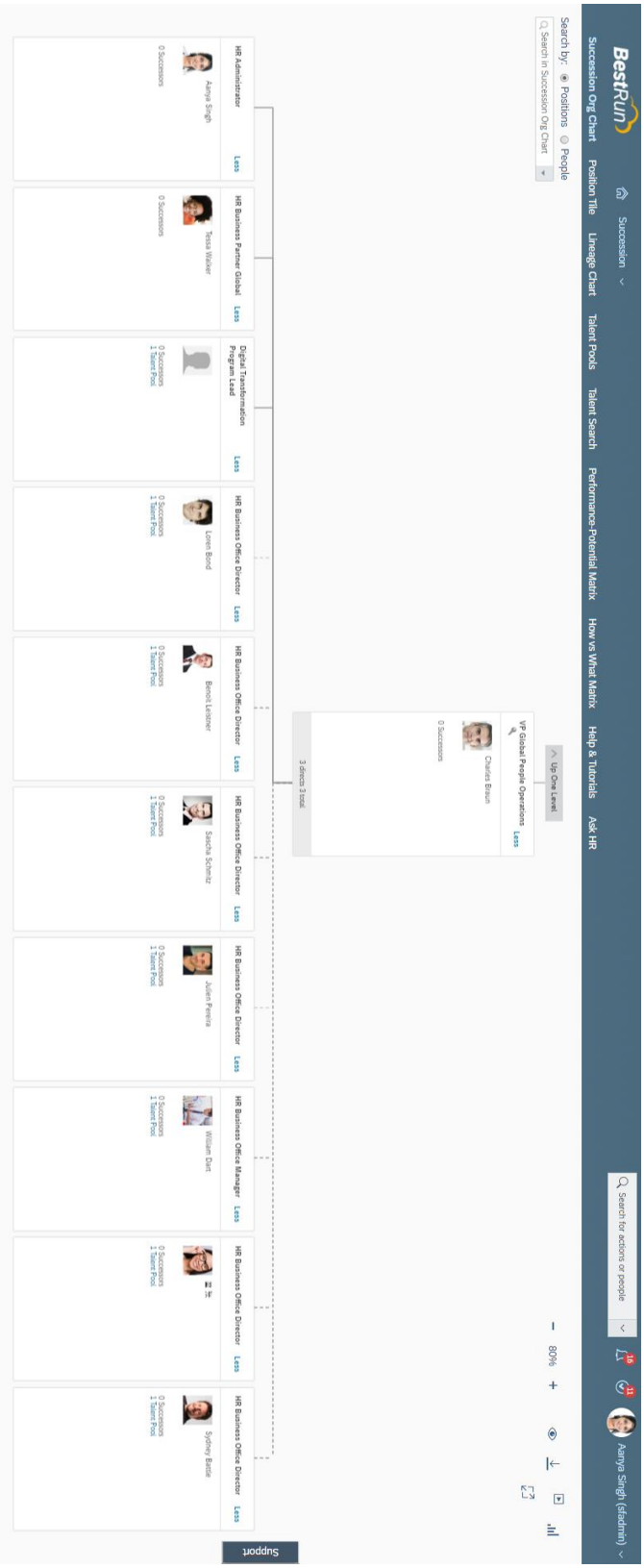

Figure 34 - Succession Org Chart, (created by the author).

Appendix 10 - SAP SuccessFactors App Activation

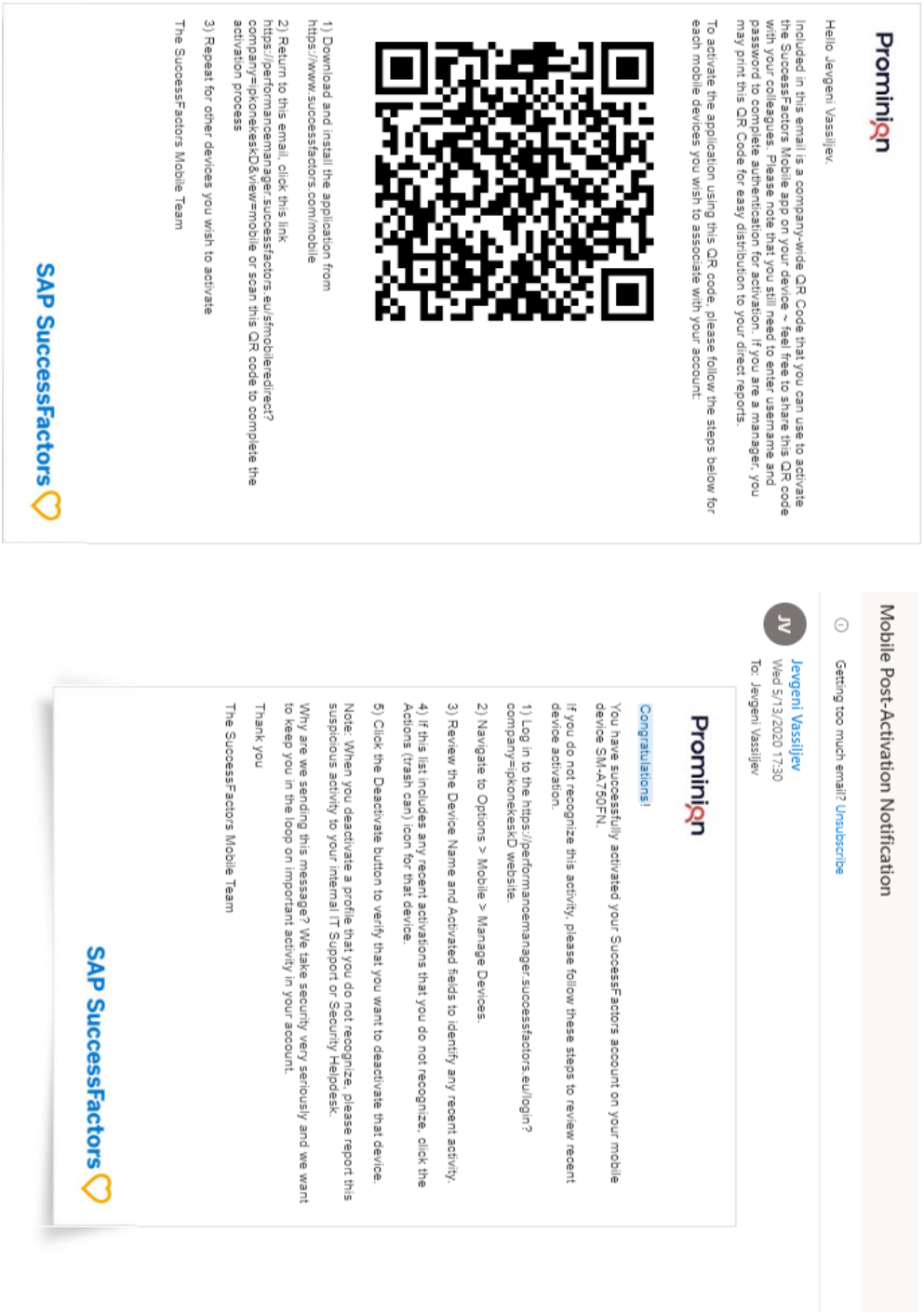

Figure 35 - SAP SuccessFactors App activation, (created by the author).

Appendix 11 - Learning Hub Portal

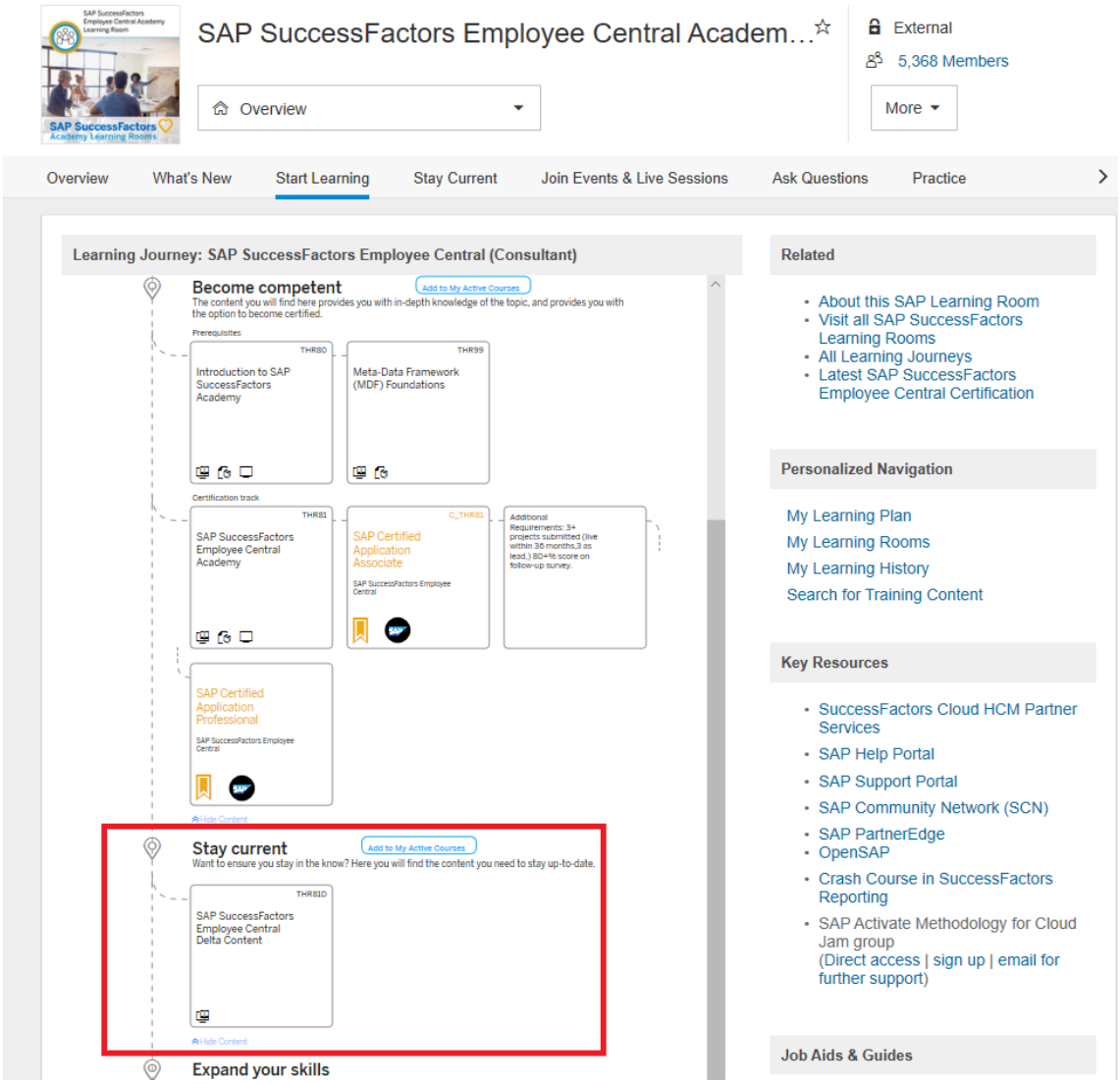

Figure 36 - Learning Hub Portal, (created by the author).

Appendix 12 - HCM System Functional Requirements

Table 11 - HCM system functional requirements, (designed by the author).

HR Core			
1. It is possible to describe/change the group structure: 1.1 in the legal entity view; 1.2 financial management view; 1.3 governance structure view.		6. It is possible to record and change information relating to the employee (such as name, gender, ID code, date of birth, home address, phone, e-mail, education, disability) and information on the persons connected to the employee (such as children/contact persons);	
2. It is possible to describe/change the positions included in the organizational structure. It is possible to manage filled and vacant positions;		7. Once the data has been entered, it is possible to generate a document (e.g. job description, employment contract); It is possible to generate amendments and terminations for employment contracts;	
3. It is possible to record information describing the position (e.g. job profile information);			
3.1 It is possible to record different attributes of the position;		8. The employee can add and change their data;	
4. It is possible to record and describe the list of different collective agreements;		9. The system sends notifications/reminders (e.g. arrival of a deadline);	
5. When managing employee's record, it is possible to record, and change information related to the employment relationship;		10. It is possible to terminate the employment relationship;	
		10.1 Application form for termination of employment;	
5.1 It is possible to record attribute of collective agreement that extends to an employee;		10.2 It is possible to record the termination data (basis for the termination of the employment, date of the termination, additional remarks on termination of the employment + system calculation of the benefits related to the final invoice, e.g. number of the days of unused / unused leave, less advance notice of the cancellation days);	
5.2 It is possible to record different attributes of the trainee (e.g. practice supervisor, educational institution, specialty, the level of education to be acquired);			
5.3 It is possible to record different attributes of the employee e.g. : 5.3.1 Employee's representatives; 5.3.2 Types (Chairman of the Management Board, member of the Management Board, First Aid Officer, Chief Trustee, Work Environment Commissioner, Member of the Working Environment Council, Trustee); 5.3.3 Name of Trade Union;		10.3 Completion of termination of employment contract (choice of appropriate form and generation of document);	
		10.4 Archiving of the employee employment relationship data.	
		11. The possibility of activating an archived employment relationship in a new employment relationship;	

5.3.4 Recognition attributed to the employee (e.g. "Aasta tegija" employee of the year);		12. It is possible to keep, and change records related to the employee health check;	
5.4 It is possible to delete new employee data when employee does not start on the position. Including cases where employment contract is already signed.		12.1 It is possible to determine the type of the health check;	
		12.2 It is possible to record employee health check results and perform validity period check.	
List of people management software modules			
1. Learning		**3. Time and Labour. Planning and accounting of working time, management of absences.**	
1.2 Training environment		3.1 Planning of working time (incl. holidays, business trips) for those working at time rates and under a schedule (different shifts, different cumulation periods, different types of absence: holidays, illnesses, absence from work: business trips, training) based on the Employment Contracts Act and as agreed upon with collective agreements. Possibility to carry out a check on whether the established rules have been taken into consideration, incl. whether the required time of rest has been guaranteed during planning. Manager can perform leave/absence and registered working time and work shift management: see/approve/enter-on-behalf of subordinate	
1.2.1 Administration of study materials (videos, presentations, documents);			
1.2.2 Development and conducting of tests;			
1.2.3 Recording of tests and courses passed by the employees.			
1.3 Record-keeping of training			
1.3.1 Compilation of development plans;			
1.3.2 Organization of development activities arising from the plan;			
1.3.3 Training budget planning;			
1.3.4 Sending invitations to planned trainings;			
1.3.5 Recording the participation in training;		3.2 Possibility to describe standard work regimes as well as standard working days. The program automatically prepares a monthly time sheet for the employees based on the previously described regimes, which can be easily changed - e.g. illnesses, unjustified absence, holidays, etc. Also, it will be possible to enter other activities with a freely assigned starting and ending time for the day. Activities may either reduce the working time or not;	
1.3.6 Recording the training-related costs;			
1.3.7 Record-keeping / statistics of training.			
2. Compensation			
2.1 Description of the employer's offer / motivation package and tying it with the employee / target group;			
2.2 The manager has online overview and information about employees, together with everything that comes with the position / role (basic salary, right to different additional pays/fees arising from the nature of work or the person);		3.3 Recording of working time by time based employees and those working under a schedule (recording working	

2.3 Exchange of information and agreements on the changes in wages (approval by higher level manager and forwarding the information to payroll);		time with different coefficients, such as evening work, night work, on-call time, overtime (in money and/or as free time), working on public holidays, etc.);	
2.4 Comparison with salary market information (online);		3.4 Exporting working time data to the payroll module.	
2.5 Assignment of variable pays (connection with performance management).		**5. Goal, Performance and Talent management**	
		5.1 Setting goals. Agreeing on goals and performance indicators;	
4. Work force planning		5.2 Sharing goals cascading in descending order;	
4.1 Description of the governance structure required for implementing the strategy (areas, companies, units, positions);		5.3 Regular review of goals and performance indicators;	
4.2 Description of job profiles (goal, tasks, responsibility, required competence, term of validity);		5.4 Asking for feedback from the manager, partners, and colleagues;	
		5.5 Describing 360-degree questionnaires to different target groups;	
4.3 Planning of work force costs pursuant to the planned work force need.			
4.4 Tying the employees (their skills and knowledge, duration of employment relationship, conditions arising from the person, such as age) with a position/role;		5.6 Evaluating the attitude and behavior when reaching the goals;	
		5.7 Evaluating completed goals and reached results. Evaluation of the period performance;	
4.5 Vacant positions / roles;			
4.6 Finding a person for the position who possesses suitable competencies (so-called talent pool);		5.8 Agreeing on the competences;	
		5.9 Evaluating the competences;	
		5.10 Agreeing on the development activities;	
Additional options			
Employee can submit resignation - exit of company (digital signature based on EU standards)			
English language as system primary language, local languages are optional/additional but not must			
Able to store documents (e.g. office documents) related to the person			
System has Baltic national government approved e-signature solution integration, able to show status of stored documents (for discussion)			
Implementation planning questions			
How long is the average solution implementation?			
Is it possible to have proof of concept of the solution before buying it?			
Can you describe the main steps for an implementation project like this?			

[https://riigihanked.riik.ee, https://my.mercell.com/m/mymercell/default.aspx].

Appendix 13 - The Project Cost and Income Statement

Table 12 - The project cost and income statement, (designed by the author).

IP Callcenters OY development project 12 months cost statement						
Position	**Quantity**	**Workload**	**Hours**	**Months**	**Rate/Price**	**Cost**
Initial costs						
Workforce expenses						
IT-Project Manager / Architect	1	1	168	3	25	€ 12,600.00
Software Developer / Disainer	1	0.75	168	3	25	€ 9,450.00
Software Developer / Tester	1	0.75	168	3	25	€ 9,450.00
Project Manager / Analyst	1	1	168	3	20	€ 10,080.00
Initial costs total						**€ 41,580.00**
Operating expencies						
Workforce expencies						
Administrator	1	0.5	168	12	20	€ 20,160.00
Support	1	0.5	168	12	15	€ 15,120.00
Software Development	1	0.5	168	12	25	€ 25,200.00
Operational costs total						**€ 60,480.00**
IT-infrastructure expensies						
Cloud Server VPS Test	1			12	18.29	€ 219.48
Cloud Server VPS Production	1			12	18.29	€ 219.48
Infrastructure costs total						**€ 438.96**
Overall costs						**€ 102,498.96**
IP Callcenters OY development projects cost / income statement in 12 months range						
Pilot Project						
Licenses	200			12	3.95	€ 9,480.00
Deploying/Configuration	1		168		65	€ 10,920.00
Cloud Server VPS Test	1			12	18.29	€ 219.48
Cloud Server VPS Production	1			12	18.29	€ 219.48
Revenue						**€ 20,838.96**
Cost of workforce	2	0.5	168	1	22.5	€ 3,780.00
Cost of infrastructure	2			12	18.29	€ 438.96
Overall costs						**€ 4,218.96**
Net Income						**€ 16,620.00**
Tender						
Licenses	4000			12	3.5	€ 168,000.00
Deploying/Configuration	1		242		65	€ 15,730.00
Cloud Server VPS Test	1			12	64.12	€ 769.44
Cloud Server VPS Production						
Revenue						**€ 184,499.44**
Cost of workforce	3	1	242		22.5	€ 16,335.00
Cost of infrastructure	1			12	64.12	€ 769.44
Overall costs						**€ 17,104.44**
Net Income						**€ 167,395.00**
Possible Profit				12		**€ 60,192.64**

Appendix 14 - SAP Cloud Platform High-level Architecture

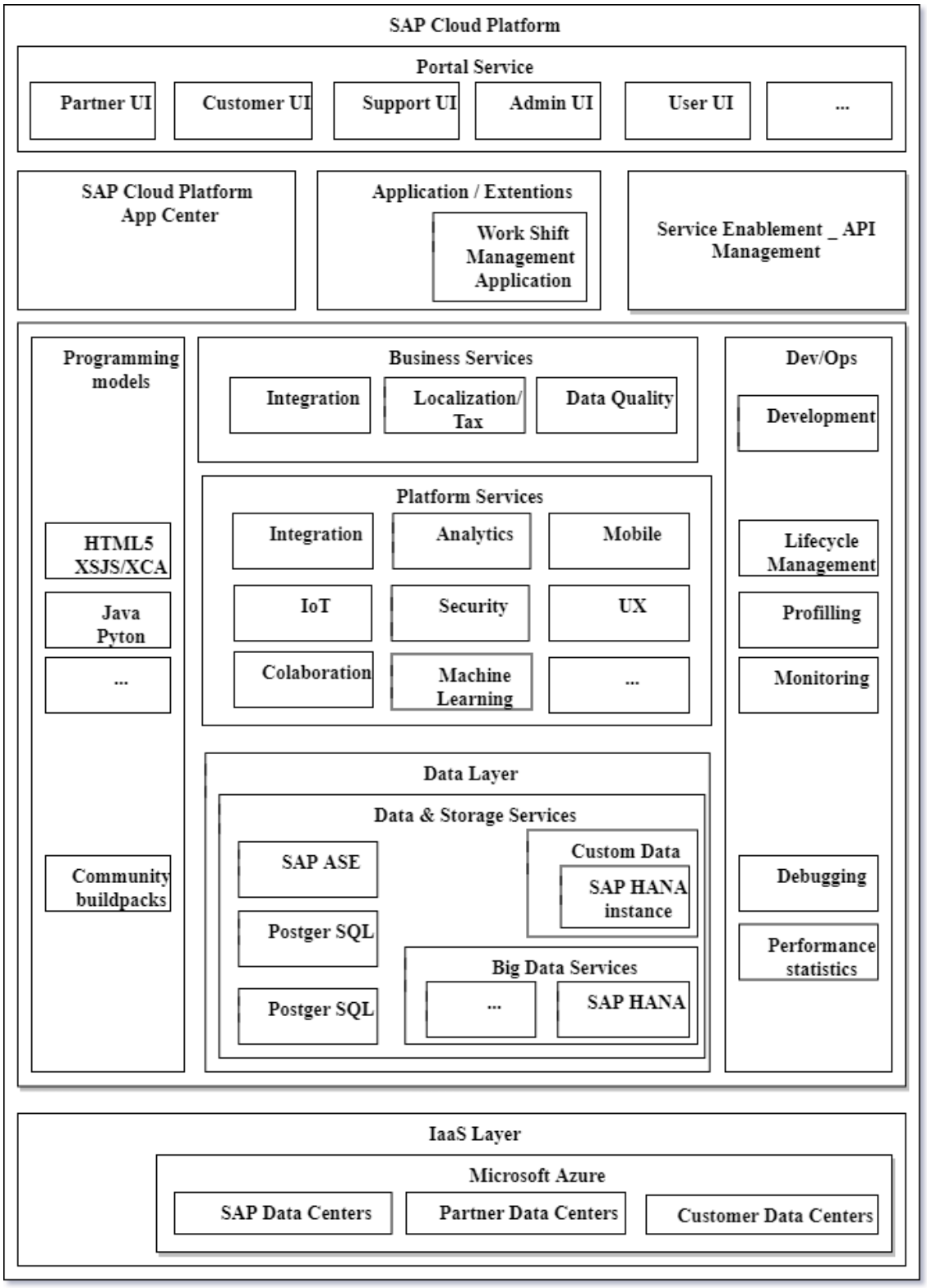

Figure 37 - SAP Cloud Platform high-level architecture [44, 45], (redesigned by the author).

Appendix 15 - Metadata Object

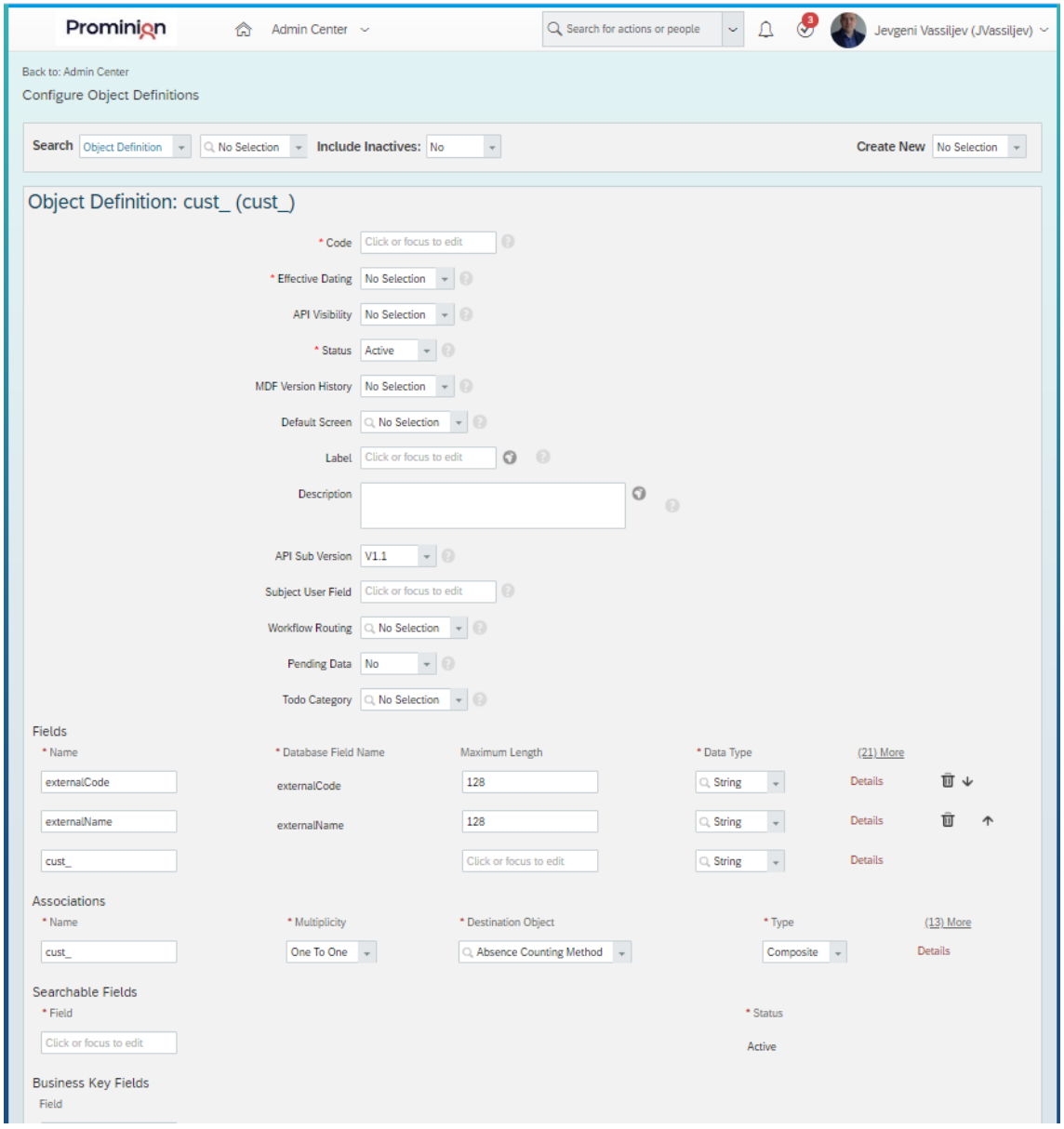

Figure 38 - Metadata object, (created by the author).