A STUDY OF A WORK SYSTEM AT TRYG

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1 Introduction

In today's dynamic business landscape, where rapid advancements characterize the corporate arena, companies need to stay on their toes, especially when it comes to team management. As we surge forward in this knowledge-driven era, it becomes crucial for companies to be aware of the skills ingrained within their workforce.

Enter Tryg, a well-respected player in Copenhagen's business scene. Despite their esteemed status, the current system employed by Tryg for tracking essential team details remains elementary, focusing primarily on basic information such as names, surnames, emails, and phone numbers. The challenge arises when attempting to capture the dynamic and ever-changing skills that each employee contributes to the organization.

Although the current basic approach is functional, it comes with inherent challenges. These difficulties, which are further explained later in the study, include the time it takes for an employer seeking a specific skill to locate an individual within the company. Additionally, there is a risk of overlooking individuals possessing the required skill simply because they lack a personal connection or haven't previously worked with the employer, resulting in the employer being unaware of their skill set.

This study delves into the intricate challenges faced by Tryg in modernizing its employee information system, enabling an effortless and prompt skill-based search. The overarching strategy involves breaking down the hurdles Tryg faces when confronting a qualification-based search within the existing workforce.

Our approach entails the meticulous design of a user-friendly platform, executed with precision to seamlessly integrate into Tryg's daily operations. Leveraging Odoo, we create a prototype to demonstrate the company's possible future resolution.

Our objective extends beyond the creation of a static repository of information; we aspire to develop a dynamic and contemporary solution that remains in sync with each employee's evolving skill set. This endeavor represents a commitment to innovation and responsiveness, aligning with the fast-paced nature of the contemporary business environment.

1.1 Company Description

Apart from being one of the most long-standing Nordic insurance enterprises, serving approximately 5.3 million customers sets Tryg as the largest non-life insurer in Scandinavia. In percentages, Tryg provides insurance coverage to 22.4% of Danish, 14.7% of Norwegians, and 17.3% of Swedes (Tryg A/S 2023). Their diverse range of insurance solutions incorporates private, commercial, and

corporate markets. The 7000 employees company handles around 1 million claims each year in the Nordic Region. Regarding their Financial Performance, in 2022 the gross premium income of the company stood at 33,938 DKK, their investment return was negative 1192, and their profit for this year stood at 2247 DKK (AnnualReports.com 2022).

1.2 Scope of the Project

In this project, we will focus on a comprehensive analysis and enhancement of Tryg's work system, particularly concerning the management of employee profiles. The overarching aim of this improvement initiative is to modify the way employees are categorized and understood within the company by introducing a classification system based on skills.

Skills, in this context, are defined as distinct, specialized abilities, knowledge sets, or competencies possessed by individuals, which they can effectively apply in a professional work-related setting. By transitioning to this new classification framework, Tryg will gain benefits for its workforce and management.

The primary objective of this project is to provide Tryg's management with the means to easily and efficiently identify the ideal employee for a specific task or project, as well as analyze how this system works now and what issues it has. This strategic alignment between employee skills and project requirements will attempt to enhance the company's operational efficiency, reducing time-to-deployment and increasing task success rates.

2 Research Design

To be able to accomplish all the analysis and enhancement of Tryg's work system, making a plan or design for how we are going to research and gather data from the company's system is crucial. In our case, we divided this research into two: interviews and self-investigation.

Our main source of data collection is interviews. Through these interviews, we were able to determine what the company does and doesn't want us to improve about the actual profiling system. A total of two interviews have been carried out with the Business Analysts & Configuration Team Lead who was our main contact and data provider inside Tryg.

Concerning the improvement process, a considerable amount of self-investigation and learning has been essential to be able to make the prototype of the new improved system. This includes the suggested modifications and enhancements we observed through the interviews.

In the next section, we will go deeper into what we mentioned in the previous paragraphs, ex-

plaining how we managed to collect data as well as how we proposed the analysis. Apart from this, we are going to explain the theory of the tools we used in our work in addition to why we used them (in the methods section).

2.1 Theoretical Framework

To be able to accomplish a successful analysis of a work system, we must use mechanisms and tools that will help us gain a deeper comprehension of our case and, consequently, offer a more tailored solution. In the following paragraphs, we will outline and explain the various tools employed in our study. A prominent knowledge source utilized in this research is Alter's book *"Work System Theory: Overview of Core Concepts, Extensions, and Challenges for the Future."* (Alter 2013). In this work, Alter provides definitions for working systems and presents diverse elements that can be applied to analyze them. In this paper, we will engage with three of Alter's models, namely the Work System Framework, Work System Life Cycle Model, and the Work System Snapshot in order to further understand and examine our company and consequently provide better-fitting solutions. Moreover, we will use UML Activity Diagrams, ER Diagrams, and Use-Case Diagrams to embody the current system and the envisioned solutions.

2.1.1 Work System Framework (WSF)

As expressed by Alter, a working system is *"a system in which human participants and/or machines perform work (processes and activities) using information, technology, and other resources to produce specific products/services for specific internal and/or external customers."* (Alter 2013). Alter's WSF breaks down the works system into nine core elements, as can be shown in Figure 1. We can group those nine elements into three divisions.

1. The first unit includes Processes and Activities, Participants, Information, and Technologies. This unit appears at the base of the pyramid in gray and contains the factors that have a direct connection to the work system and can be seen as the work system itself.

2. The next group includes Customers and Products/Services. This segment is characterized by elements that can interact with the work system both externally and internally to the company, at the same time.

3. The last segment includes Environment, Infrastructure, and Strategies. This segment is characterized by components that are essentially external to the work system and yet have a direct influence on it.

The connection between the different core stones is indicated by the arrows linking the various elements (Figure 1).

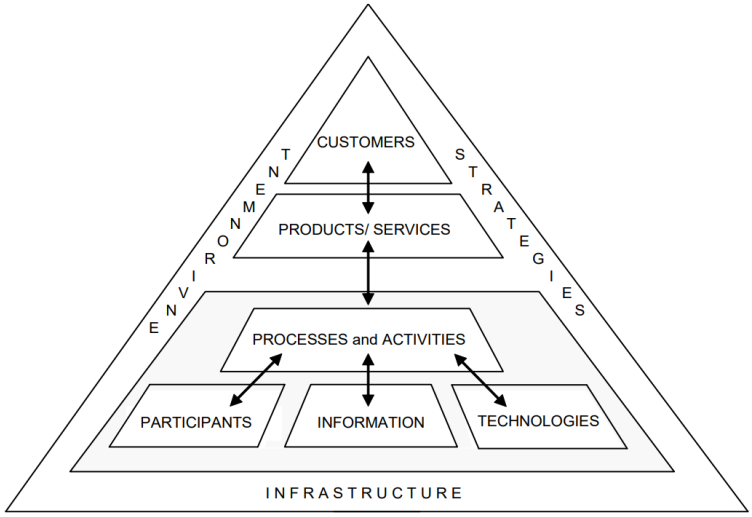

Figure 1: The Work System Framework

2.1.2 Work System Life Cycle Model (WSLC)

A work system life cycle model (WSLC) is defined as a *"Representation of the iterative process by which work systems evolve over time through a combination of planned change (projects) and emergent (unplanned) change that occurs through bricolage, adaptations, and workarounds."*(Alter 2013)

As we can observe in Figure 2, this WSLC is composed of four main iterative phases:

- Initiation: Statement of what the problem is and what general approach will be used to attain work system improvements.
- Development: Involves creation or acquisition of resources required for the implementation of desired changes in the organization (Alter 2013).
- Implementation: Refers to implementation in the organization, not implementation of algorithms on computers (Buchholdt 2023).
- Operation and Maintenance: It starts with short-term adaptations and workarounds of cumbersome processes. It also includes longer-term changes in practices or goals that occur as adaptations and workarounds are incorporated into organizational routines (e.g., Feldman & Pentland, 2003) without requiring formal projects (Alter 2013).

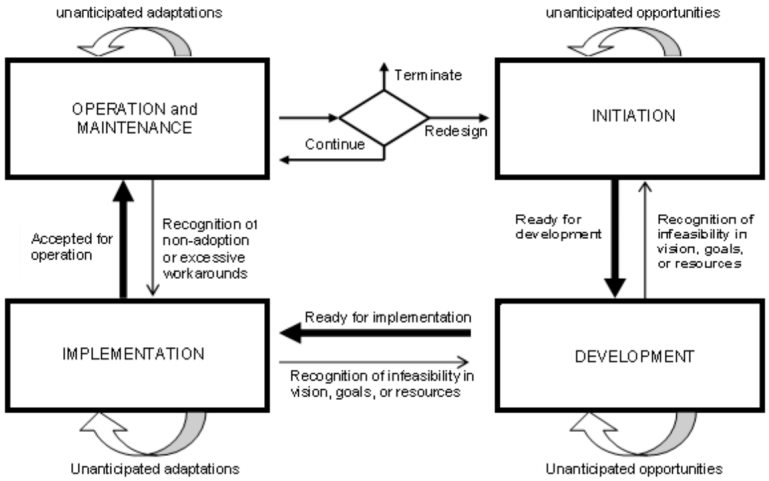

Figure 2: The Work System Life Cycle Model (Alter, 2008a, 2008b)

2.1.3 Work System Snapshot

According to Alter, a Work System Snapshot is *"A formatted, one-page summary of the work system in terms of six elements of the work system framework: processes and activities, participants, information, technologies, products/services produced, and customers of the work system. Used for summarizing the "AS-IS" work system and the recommended "TO-BE" work system."* (Alter 2013). Expressed differently, Work System Snapshot serves as a tool that employs elements we are already familiar with from Alter's WSF in order to encapsulate or outline a work system in a concise and coherent way.

2.1.4 UML Activity Diagram

"UML, which stands for Unified Modeling Language, is a way to visually represent the architecture, design, and implementation of complex software systems." (Lucidchart 2023b). UML Activity Diagram is one type of UML diagram and is associated with behavior diagrams. It serves to model the various activities or actions that systems must undertake.

2.1.5 Entity Relationship Diagram

According to Lucidchart; *"An Entity Relationship (ER) Diagram is a type of flowchart that illustrates how "entities" such as people, objects or concepts relate to each other within a system."* (Lucidchart 2023a). Phrased differently, ERD allows us to simply demonstrate the inner connection between the attributes of our system as well as visibly indicate what each attribute stands for.

2.1.6 Use Case Diagram

"The main purpose of a use case diagram is to portray the dynamic aspect of a system. It accumulates the system's requirement, which includes both internal as well as external influences." (JavaTPoint 2023).

In other words, the use case diagram serves as a visible representation of a system's requirements, focusing on the envisioned behavior rather than the technical or theological aspects that are inherent in its implementation. It showcases the primary and secondary actors, and the way they can interact with the system. Furthermore, it can illustrate the subsequent actions that must be undertaken (included) in response to a given action, as well as those actions that are optional but represent possible reactions of the system (excluded).(Paradigm 2023).

2.1.7 Cost-Benefit Analysis

In this paper, the cost-benefit analysis will be used to evaluate the financial implications and potential return on investment for the proposed system. This includes an assessment of the direct and indirect costs associated with the development and implementation of the system. It will also quantify the benefits, such as increased efficiency, better utilization of employee skills, time savings, and potential for enhanced project outcomes within the company. However, since it was not within our reach to collect precise data on the cost and implementation of this project we want to precise that our analysis is just an estimation and not a completely precise calculation. In order to achieve the best possible outcome using this tool we will employ the article by the authors Ward, J., Daniel, E. and Peppard, J. called "Building Better Business Cases for IT Investments".

- **Define Business Drivers and Investment Objectives**
  This step involves identifying the key reasons behind the need for the proposed system and what the project aims to achieve.

- **Identify Benefits, Measures, and Owners**
  This involves specifying the expected benefits of the project, how these benefits will be measured, and who will be responsible for them.

- **Structure the Benefits**
  This step is about organizing the benefits in a logical structure, potentially categorizing them into immediate, short-term, and long-term benefits.

- **Identify Organizational Changes enabling Benefits**
  This involves pinpointing what changes within the organization are necessary to realize the benefits.

- **Determine the Explicit Value of each Benefit**
  This section involves assigning a quantifiable value to each benefit of the analysis.

- **Identify Costs and Risks**
  Finally, this step includes detailing all costs (development, implementation, training, etc.) and identifying potential risks (such as resistance to new system adoption, data privacy concerns, or technical challenges).

		Type of Business Change		
		Do New Things	Do Things Better	Stop Doing Things
High ↑ Degree of Explicitness ↓ Low	Financial Benefits			
	Quantifiable Benefits			
	Measurable Benefits			
	Observable Benefits			

Figure 3: Framework for Developing a Business Case (Ward et al. 2008)

2.1.8 Implementation Strategies

In his publication, Madkan 2014 reflects on the various strategies that companies may employ to achieve successful implementation of a new system while discontinuing the legacy system. He explores four strategies: the Big Bang, Phased Rollout, Parallel Adoption, and the Hybrid approach.

- **Big Bang transition strategy**
  In the Big Bang approach, the company abandons the legacy system and migrates to the new system in one major event. While its major benefits include swiftness and efficiency, this approach is not without its flaws. It requires a comprehensive understanding of the old system and an extended preparation time to avoid failures. Additionally, due to the rapid transition, certain process components may be overlooked, and it is providing less training time for the new systems. Most importantly, if the new system encounters issues, recovery might be challenging.

- **Phased Rollout / Incremental Strategy**
  The Incremental Strategy involves breaking the implementation into modules introduced gradually, thereby replacing the legacy system in a phased manner. Its main advantages include reducing the scope of each module implementation, thereby minimizing associated risks. It requires fewer resources, and provides more time for change adaptations, but is lengthier, more expensive, and necessitates compromises.

- **Parallel Adoption**
  In this strategy, the legacy and new systems run concurrently until the new system is thriving, at which point the legacy system is terminated. The parallel adoption's transition phase is slower than the Big Bang but faster compared to phased adoption. The user adaptation process is easier than the Big Bang but more complex than the phased rollout. However,

it is the most expensive approach, requiring substantial resources, and involves functional duplication as both systems operate simultaneously.

- **Hybrid Approach**
  The hybrid approach represents a mix-and-match of other strategies, allowing a less rigid, more flexible approach tailored to the specific needs of the company or system.

This categorization provides insights into the strengths, weaknesses, and considerations associated with each implementation strategy, aiding companies in making informed decisions based on their unique requirements.

2.1.9 Status Quo Bias Theory

In this study, as part of our implementation section, we will utilize Kim's and Kankanhalli's Status Quo Bias Theory. According to them, *"Status quo bias theory aims to explain people's preference for maintaining their current status or situation"* (Kim et al. 2009). In their paper, Kim and Kankanhalli categorize the leading reasons for status quo bias into three prominent categories.

1. **Rational Decision making**
   Points to sensible logic-based process prior to the decision making. It is further separated into three subcategories, namely;
   - **Net Benefits**
   - **Transition Costs**
     Expenses accumulated due to the process of adjusting to new circumstances.
   - **Uncertainty Costs**
     Embodies the uncertainty or perceived risk linked to the change.
2. **Cognitive Misperceptions**
   - **Loss aversion**
     A cognitive tendency to experience the sorrow of losing something more profoundly than the joy of acquiring the same thing.
3. **Psychological Commitment**
   - **Sunk Cost**
     Discusses the investments made in the past that are unrecoverable. It can encompass skills associated with the previous mode of operation, that will be rendered obsolete when transitioning to the new system. The initial commitment to acquiring those skills results in a perceived loss and reluctance to switch to the alternative system.

- **Social Norms**

  How the change is perceived and discussed among the employees within the company can shape opinions, either fostering a positive transition or resistance, leading to a smooth or challenging adaptation.

- **Control**

  Employees within the company may opt to maintain the status quo to preserve a sense of control and steer clear of unfamiliar approaches.

Model Hypotheses

Kim and Kankanhalli developed eleven hypotheses, relating the discussed status quo bias factors to concepts adapted in technology acceptance literature and the Equity Implementation Model (EIM). These connections are illustrated by Figure 4.

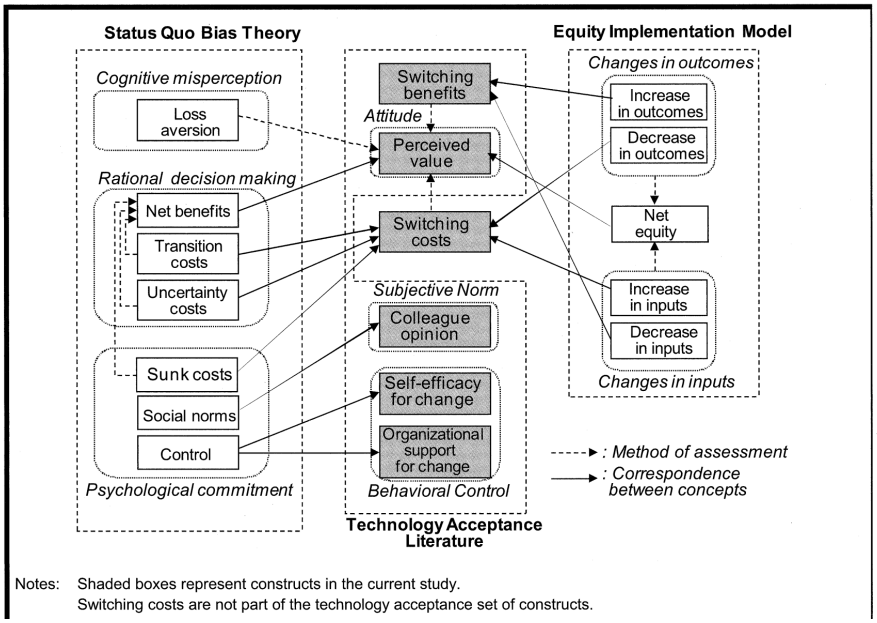

Figure 4: Status Quo Bias Theoretical Framework (Kim et al. 2009)

The list of formulated hypotheses goes as follows;

H1: Perceived value has a negative effect on user resistance.

H2: Switching costs have a positive effect on user resistance.

H3: Switching costs have a negative effect on perceived value.

H4: Switching benefits have a positive effect on perceived value.

H5: Self-efficacy for change has a negative effect on user resistance.

H6: Self-efficacy for change has a negative effect on switching costs.

H7: Organizational support for change has a negative effect on user resistance.

H8: Organizational support for change has a negative effect on switching costs.

H9: Favorable colleague opinion has a negative effect on user resistance.

H10: Favorable colleague opinion has a negative effect on switching costs.

H11: Favorable colleague opinion has a positive effect on switching benefits.

Through hypothesis testing, they were able to conclude the hypotheses H5, H8, and H9 are not supported.

2.2 Methods

In the following section, we will elaborate on the process of data collection and the different analytical approaches and methods used in this research. Additionally, we will explain the reason for the selection of the previously explained tools, employed in our study, as well as how we think they can help us with the study of the work system.

2.2.1 Data Collection

Initial meeting Our journey with Tryg commenced with an initial discussion with René Thorny, Tryg's Business Analyst and Configuration Team Lead. During this conference, René gave us a generic overview of the company's state, which was enough to identify a work system, including its components, as well as different problems for which we can propose and make solutions. The field notes from this interview are attached to this paper, see Appendix A.

Second meeting In the follow-up meeting with Réne, we dug deeper into the company's atmosphere and applied approaches when it comes to skill-based search within the organization's workforce. Moreover, we identified who would be the work system's main end-users, according to René. The transcript of this meeting is available in Appendix B for the readers' convenience.

2.2.2 Data Analysis

Upon gathering data through interviews, our objective was to construct a simplified model of the current system. This model aimed to facilitate the identification of any misalignment within the existing system. To achieve this, we utilized Atlers' work system snapshot as well as an activity diagram. Guided by Alter's Work System Life Cycle (WSLC), we analyzed the interdependencies of the various aspects of the works systems. This allowed us to deduce the impact of any misalignment on the overall functioning of the company. Once a comprehensive understanding of the current system's behavior was established, we formulated our observed requirements for an improved system.

2.2.3 Reflections

As mentioned previously in the Data Collection section, all of our interviews have been done with Tryg's Business Analyst and Configuration Team Lead René Thorny, which means that the data that has been collected through these meetings might be biased. Considering the fact that the data collected are points of view according to the work system that is being analyzed, having only one employee perspective leads unavoidably to biased data.

Taking this into account, it is important to mention that all the analysis, problem-finding, and solution proposed are based on biased data, due to the fact that we only have information about the actual state of the work system from one individual in the company. If we had the opportunity to interview more employees we would have improved considerably this 'data bias' situation, having several different points of view to work with.

3 AS-IS Analysis

In the ensuing section, we will dive into the current way Tryg is conducting skill-based searches. Using an activity diagram and an AS-IS snapshot we care to visually illustrate the present procedure to clearly emphasize the struggles it presents and which problems we identify that we could potentially solve.

3.1 Activity Diagram

In order to visualize how the process of this work system is, we made an activity diagram, which includes all the steps that the participants of the process perform during it. As we can observe in Figure 5, the process requires some back-and-forth communication between the employees and the managers / Team Leads which leads unavoidably to sub-optimal outcomes, as well as the possibility of losing data during the exchange of information between the participants. All the problems and issues are developed in section 3.5 of this paper.

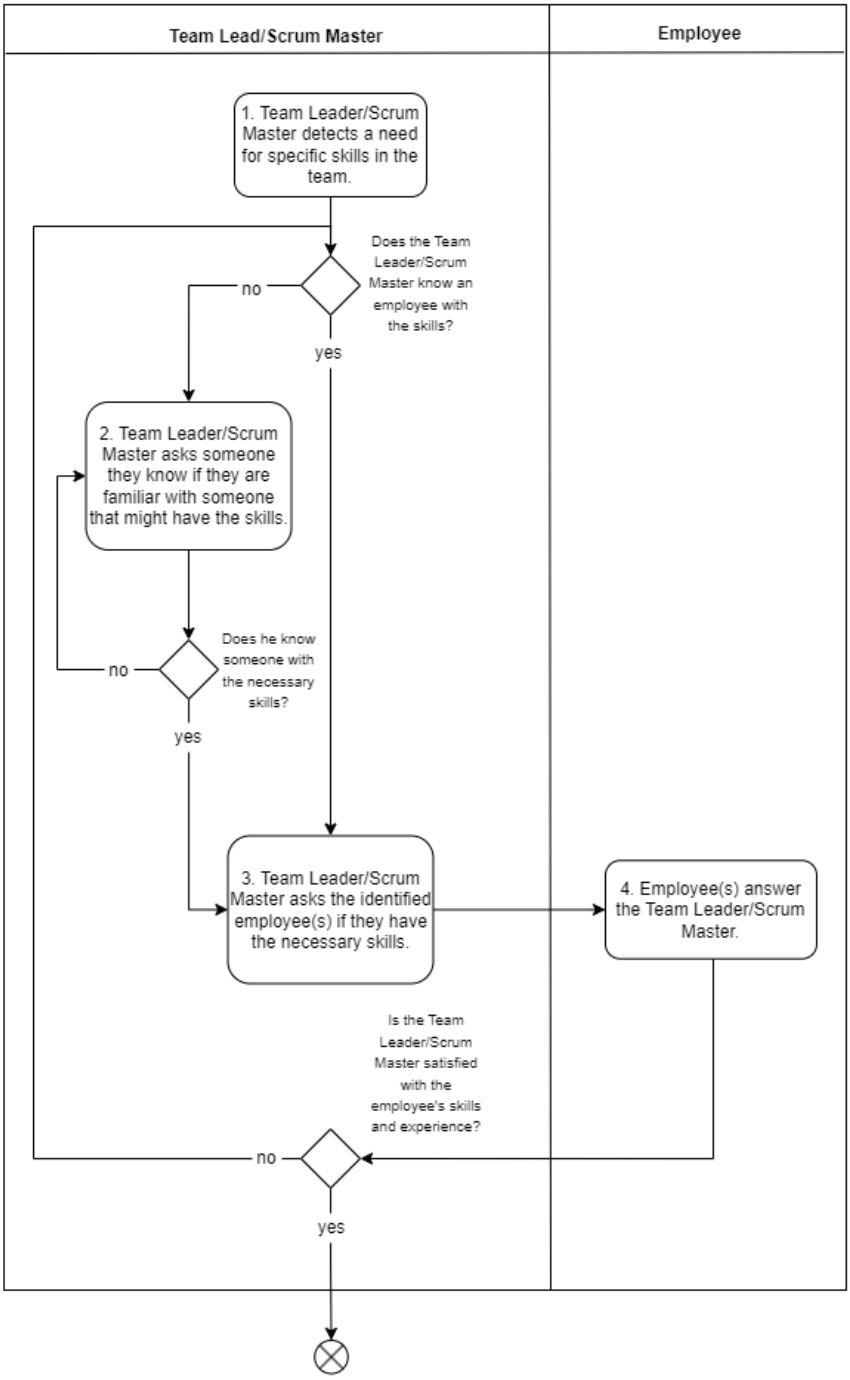

Figure 5: UML Activity Diagram

3.2 Trygs Skills Overview Snapshot

To elaborate on the functionality and components of the existing procedure, we employ Alter's snapshot. As depicted in the snapshot, the system lacks dedicated technology and suitable information, leading to a long and unnecessary process with multiple steps.

Customers	Products/Services
Team Leaders	Skill based employee search within the companies' existing employees
Scrum Masters	Finding a specific skill inside a team
Major activities and processes	
- Team Leader/Scrum Master detects a need for specific skills in the team - Team Leader/Scrum Master go find an employee they know has the specific skills or if they do not know they ask someone they know if they know someone. - Team Leader/Scrum Master asks the employees if they have the necessary experience to do that - Employees answer the Team Leader - Team Leader/Scrum Master takes into consideration the employee - Team Leader/Scrum Master either accepts or repeats the process to search for another employee	

Participants	Information	Technologies
Team Leaders	Task description	Teams
Employees of the company	Skills needed for the task	SharePoint
Scrum Masters	List of employees	Email

Table 1: AS-IS Snapshot

3.3 Work system Framework in relation to Tryg

After an analysis of Tryg, we have recognized its work system as Trygs Skills Overview. In this section of the report, we are going to talk about all the components of this work system. These components are the eight elements of a work system described by Alter.

3.3.1 Costumers

The work system generates benefits for all employees at TRYG, identifying team leaders and scrum masters as the primary internal customers of this system. In this case, TRYG's work system primarily is for internal customers. This distinction is crucial in understanding the work system's dynamics on operational efficiency.

As René highlighted in an interview, Team leaders and scrum masters often lose valuable time in locating employees with the requisite skills for specific tasks, *"you need to have been there for several years in order to know other people with those skills. (Appendix B, Line 25)"*.
This challenge underlines the need for a more streamlined process within our work system. This

insight into the work system at TRYG reveals the significant influence that internal customers, team leaders, and managers, have on the design and effectiveness of the system. Recognizing their role is crucial for optimizing the work system and ensuring its intended outcomes.

The emphasis on internal customers in this context underscores the necessity for precise and efficient communication channels within the organization, facilitating faster and more effective skill allocation.

3.3.2 Product & Services

In the current TRYG work system, the primary products are the allocation of tasks and the management of employee skills, essential for internal operations. As we analyze the AS-IS system, it is evident that these products are distributed manually, often through direct communication, Microsoft teams, or emails by team leaders or scrum Masters seeking specific skills among employees either in their department or department where they know someone; In regards to this, when asked *"What technological tools or platforms are currently used for skill identification or general communication?"* our informant answered without hesitation *"None. There's no such thing as a skill identification to the company. (Appendix B, Line 50)"*. This process, while could be functional for some employees, might not always work, and lacks efficiency.

Reflecting on the principles stated by Alter (2013), work systems are designed to produce outputs that benefit their customers. In TRYG's case, the customers are the team leaders and scrum masters who require a more efficient method for finding employees' skills when needed. Currently, this identification is unstructured and time-consuming, highlighting a significant area for improvement.

3.3.3 Participants

By examining the participants of Tryg's work system, we gain insights into who is involved and responsible for various activities. In this case, the participants in this system are all the employees of Tryg; however, the key participants are the team leaders and scrum masters across different departments. Each group plays a very specific role in the functioning of the work system, especially in the context of task allocation and skills finding.

When asked who the primary end-users of the skill identification system within the company are, our Tryg informant responded *"I would say anyone who works with project management [...] mainly, Team leads and managers probably. (Appendix B, Line 70)"*, so we can say that Team Leaders/ Scrum Masters are primarily responsible for identifying and assigning tasks based on employee skills, and the rest of the employees are part of the work system by being identified by their skills and experience. This process, as currently structured, involves a time-consuming search for suitable employees.

The participants across TRYG use speech, email, or messages (Teams/SharePoint) to communicate with one another as seen in Activity 3 and 4 of the AS-IS Activity Diagram.

3.3.4 Information

Regarding Trygs work system, the information used during the process can be divided into 2 main parts:

1. Task description and details: This information is defined by the Team Lead or the corresponding manager when the new task to fulfill appears. This information is passed from the Team Lead to the Employee when they first communicate during this process.

2. Employee information: The Team Lead, after communicating with the different employees from the company, evaluates the possible candidates to work on the new task based on their skills and past experiences. This information is being managed by the Team Lead and different managers for them to conclude if they are choosing them or not for the task.

3.3.5 Technologies

As we could observe in the interview, the participants of the process of this work system rely on the most traditional methods available. The communication between Team Leads and employees is based mainly on emails, Teams messages, and in-person conversations as well as a more developed software called SharePoint, according to our informant *"everyone uses Teams and channels SharePoint. (Appendix B, Line 83)"*.

In the context of this process, relying on these traditional methods is very time-consuming and unoptimized. This is due to the fact that this requires both sides of the communication to be aware that this process is happening, as well as having to wait for each side to answer the other one, losing this way time that could be invested in completing other tasks.

In any case, as mentioned before, Tryg also makes use of slightly more modern technologies such as SharePoint. SharePoint is a software that allows the creation of two types of sites: a team site to connect people on the same team or a communication site to reach a broader audience throughout the organization (Madrid 2022).

Apart from all these communication technologies, the Team Lead has to manually filter all the employees depending on the answer given by the company worker. This is also a very tedious task that consumes time and energy sorting all the employees just to identify the best candidate to work on the specific task.

3.3.6 Environment

The company's environment is characterized by a standardized and formalized approach to communication, leveraging Microsoft tools for collaboration *"we are pretty much we are Microsoft House. (Appendix B, Line 83)"*. The perception of skilled workers' availability is acknowledged as challenging without dedicated skill-tracking tools (Appendix B, Line 60, 93). The strength of personal connections appears stronger within specific projects or departments (Appendix B, Line 96), revealing potential opportunities for enhancing collaboration across the entire organization. The emphasis on strategic choices in communication tools reflects a conscious effort to maintain a structured and regulated communication environment. Moreover, during our interviews, we observed that one of the company's main goals is to consistently professionally develop the existing staff in order to obtain the department's natural growth rather than hiring new employees or relying on external help (Appendix B, Line 100).

3.3.7 Infrastructure

According to Alter *"Infrastructure includes relevant human, information, and technical resources that are used by the work system but are managed outside of it and are shared with other work systems."*(Alter 2013).

As stated above, the company's primary communication channels include Microsoft tools like Teams, SharePoint, and Outlook. It is important to state that while there is a recording of the employees' CVs in an external HR system, those are not being used in the internal skill search process, we can see this in the next statement of our Tryg informant: *"whenever you are employed at work, they will create a profile in Active Directory [...] it's only limited information that goes from the HR application to the AD, such as the email, the name, the title, and the phone number. (Appendix B, Line 33)"* Note that the information available in AD is the only information about the employees that managers have access to. The personal connections of the employees are strong between colleagues in the same departments and between co-workers who collaborate through common projects (Appendix B, Line 98). However, the employees' linkage fades when it comes to cross-department connections. This lack of communication may indicate a problem in the currently used work system infrastructure and an opportunity for a change that would maximize the company's ability to handle the need for skilled individuals.

3.3.8 Strategies

The company follows a strategy of emphasizing internal skill development and managing the gap in skills through personal goals(Appendix B, Line 100). The focus is on reducing the reliance on external recruitment by enhancing the skills of current employees. The preference for development within the existing workforce is based on two main points. First, it is challenging to find people with the right skills externally. Second, it is considered more cost-effective and strategically important

to cultivate skills within the current workforce. Therefore, if a skill is critical and readily available within the company, internal development is favored. Nonetheless, for specialized skills, external hiring or consulting may be considered, given the complexity and specificity of the skill set.

3.4 Work System Life Cycle Model in relation to Tryg

As mentioned before, we have recognized its work system as Trygs Skills Overview. According to the Work System Life Cycle Model (WSLC), Trygs Skills Overview is currently in the *initiation* phase. After studying the case, problems were identified and a general approach to resolve these problems was discussed to find the best solution for the issues Tryg is facing, concluding this way in which phase this work system is currently at.

3.5 Problems and/or Opportunities

According to Alter, *"By the system nature of work systems, the components and interactions in a work system should be in alignment, which implies that all components and interactions should be aligned with the work system's goals."*(Alter 2013). Put differently, the components of the work system framework, as illustrated in Figure 1, depend on each other. The malfunctioning of one element may lead directly or indirectly to the ineffectiveness of the rest. Through our observation, we were able to detect the following component misalignment.

The first problem we identified is regarding the information retained for each employee. The maintained knowledge concerning each employee is insufficient and lacks the worker's set of skills. This inadequate background data undermines the companies' abilities to handle the search for a worker with a specific skill in the existing workforce.

The next problem concerns the companies' processes. At the moment the company doesn't have a standardized procedure that entails the steps one should take when attempting to fill a position, utilizing existing employees with specific skill needs. The absence of a uniform skill-search process can affect the process' effectiveness and result in substantial time waste.

The next challenge concerns the company's environment. When asked to describe the strength of personal connections and network within the company, René responded *"I think it's very good within the department. I think it's kind of poor between departments. (Appendix B, Line 96)"*. The absence of strong personal connections between each and every department is natural and in itself doesn't necessarily pose a crucial problem for the company's continuation. However, since the skill-based search relies on personal connections, the immediate result would be a loss of skills flow between departments.

The last issue involves the company's technological tools or lack thereof. At the moment, there are

no operating systems for skill-based search employees. This void results in a long search procedure, consuming the time and effort of all of the participants.

4 TO-BE Analysis

In the following section, we will introduce the proposed changes that we have formulated to address the challenges posed by the current capability-centered search procedure. To illustrate the changes we utilised again the activity diagram and snapshot. In this part, we also employed an ER diagram and a use case diagram.

4.1 Changes

Having the currently applied procedure comprehensively outlined and its associated issues and challenges acknowledged, we can proceed to the following phase, namely, change suggestions. In light of the pinpointed challenges, discussed in the preceding section, we propose the introduction of a skill-based search system. The system will catalog the skills possessed by each individual and allow filtered search based on skill. This filtered search aims to facilitate a more targeted and precise exploration within the existing workforce. The emphasis is on creating a standardized system that ensures the verification and conciseness of information related to the employees' skills. Moreover, the system will assist the company in making more suitable decisions by ensuring the employers are informed about the availability of the required skills within the company's workforce. An additional benefit of the system is that it can be used to shed light on potential skill gaps and enable the company to be aware of sparseness in the existing skill pool among its workers. Such insight may empower the company to proactively address and bridge any deficiencies in its competence reservoir. In order to demonstrate the distinction between the existing procedure landscape and the envisioned qualification-centric search system, we will present the TO-BE Activity Diagram and discuss it in the following paragraph. Additionally, we will present a TO-BE snapshot that would serve as a visual representation of the anticipated improvement brought by the proposed system, offering a comprehensive view of the transformation journey from the AS-IS to the TO-BE state.

4.2 TO-BE Activity Diagram

In the intention to visually represent the TO-BE systems' desirable behavior, we once again utilized an activity diagram. The diagram represents the path the various users may interact with the system. Additionally, it would serve as a crude blueprint for the system's implementation.

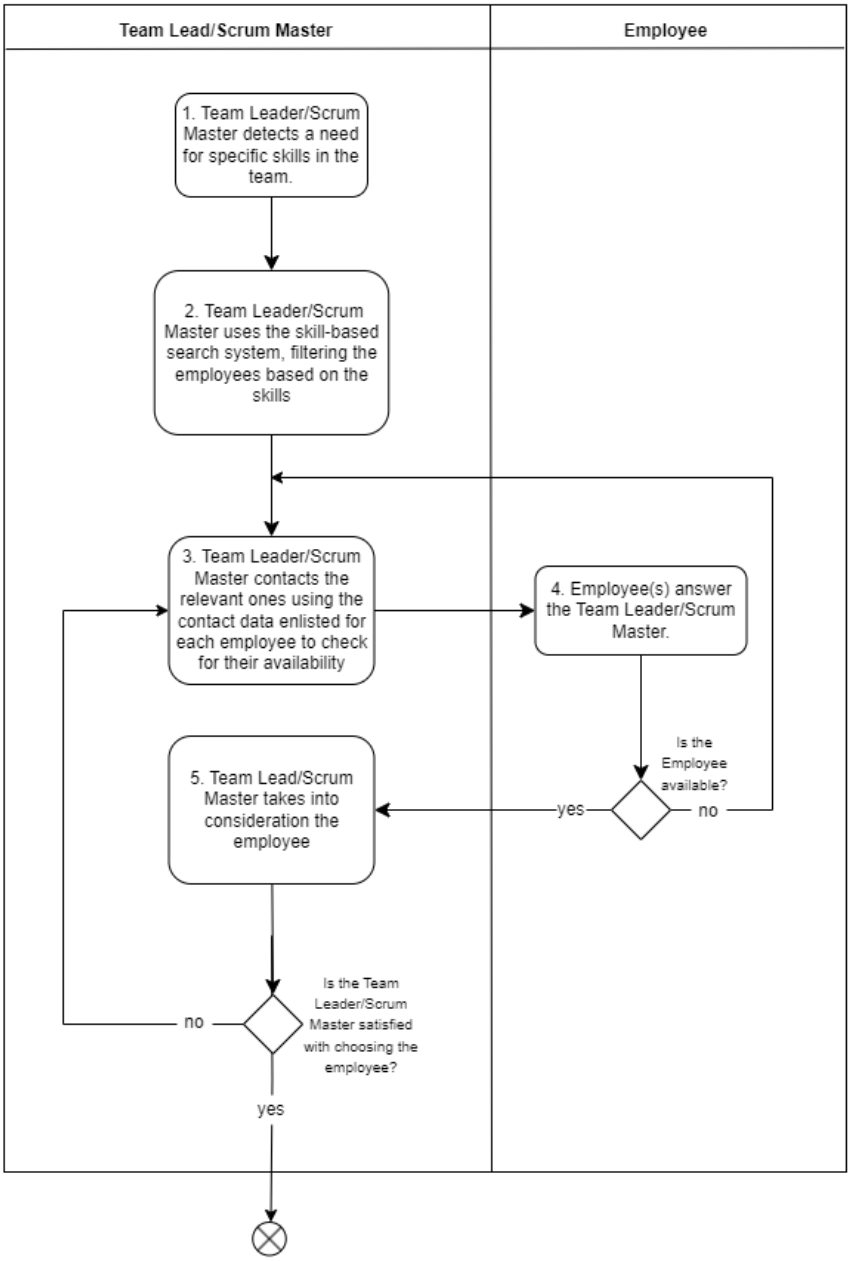

Figure 6: To-be UML Activity Diagram

4.3 TO-BE Snapshot

For the purpose of emphasizing the envisioned changes we plan to intake, we utilized again Alter's Work System Snapshot. The snapshot outlines the desired upgraded system, detailing the system's components. We see that in the resulting Snapshot, the information encapsulated in the system is more valuable and elaborated. Moreover, unlike before, the system's technologies aren't built solely from communication tools but also include an engine designed specifically for the system's reasoning.

Customers	**Products/Services**
Team Leaders	Skill based employee search within the companies' existing employees
Scrum Masters	Finding a specific skill inside a team
Employees	employee profiling

Major activities and processes

- Team Leader/Scrum Master detects a need for specific skills in the team
- Team Leader/Scrum Master uses the skill-based search system, filtering the employees based on the skills needed
-If there are available employees with the necessary competence the Team Leader/Scrum Master contacts the relevant ones using the contact data enlisted for each employee to check for their availability
- Employees answer the Team Leader
- Team Leader/Scrum Master takes into consideration the employee
- Team Leader/Scrum Master either accepts or repeats the process to search for another employee

Participants	**Information**	**Technologies**
Team Leaders	Task description	Teams
Employees of the company	Skills needed for the task	SharePoint
Scrum Masters	List of employees	Email
	Employees' Skills	Skill-based search engine
	Employees' contact information	

Table 2: TO-BE Snapshot

4.4 Requirements Specification

The software requirements specification (SRS) in the following is based on the standards of writing requirements from IEEE (The Institute of Electrical and Electronics Engineers, 1998).

The requirements can be defined as functional and non-functional. The Functional ones *" define the fundamental actions that must take place in the software"* (IEEE, 1998. p.16), and the non-functional ones describe "how" the software should work.

The SRS is based on the analysis we conducted and the interviews we had. While we didn't have the opportunity to directly validate our requirements with TRYG employees, the requirements

are founded on data obtained from them, mitigating potential concerns. Identifying the SRS before starting working on our prototype provided us with a clearer comprehension of the specifications and functionalities our software should encompass. This proactive approach has not only enhanced our understanding of the software's nature but has also allowed us to delineate the anticipated users and their potential interactions within the system.

4.4.1 Functional Requirements

1. The system shall maintain a profile for each employee, listing their past skills.
2. The system shall allow users to modify their profiles, including adding and deleting skills.
3. The system shall ensure that users cannot modify the profiles of other users.
4. Users shall be able to search/filter employees by skills.
5. Users shall be able to view the contact methods of employees.
6. The system shall send an automatic email to users every month, requesting an update/review of their profile.
7. The system shall categorize and manage a wide range of skills.
8. The system should have equal access levels for all users (no distinction between Team Leads, Scrum Masters, and employees).
9. the system shall not retain information of past employees that left the company.

4.4.2 Non-Functional Requirements

1. The system should have an intuitive user interface that is easy to navigate.
2. The system should be scalable to accommodate a growing number of users and data.
3. The system will be available only in English.
4. The system can only contain users with a specific domain (@tryg.dk).

4.5 ER Diagram

In order to construct a robust system, we need to establish the data framing as well as the information that would be carried in it. We used an Entity Relationship Diagram (ERD) to illustrate the data structure and the proposed connection between the entities. Our suggested ER diagram is presented in Figure 7.

As mapped out by the diagram, we decided to separate our data into three primary tables.

- **Employee** is comprised of general information about the employees
- **Skills** incorporates information about the various skills
- **Employee Skill** represents the many-to-many relationship between employees and skills, enabling each employee to possess many skills and each skill to be acquired by multiple employees.

This structural design provides adaptability for incorporating additional details and expanding the system in the future.

Let us now observe the relations between the discussed attributes. The connection between **Employee** to **Employee Skills** is a mandatory-one to mandatory-many. One employee can be associated with multiple skills however, he has to have at least one. Conversely, the connection between **Skills** to **Employee Skills** is an optional many to many. While one skill can be acquired by multiple employees, not all skills are necessarily available in the company. Additionally, the same employee cannot have the same skill more than once.

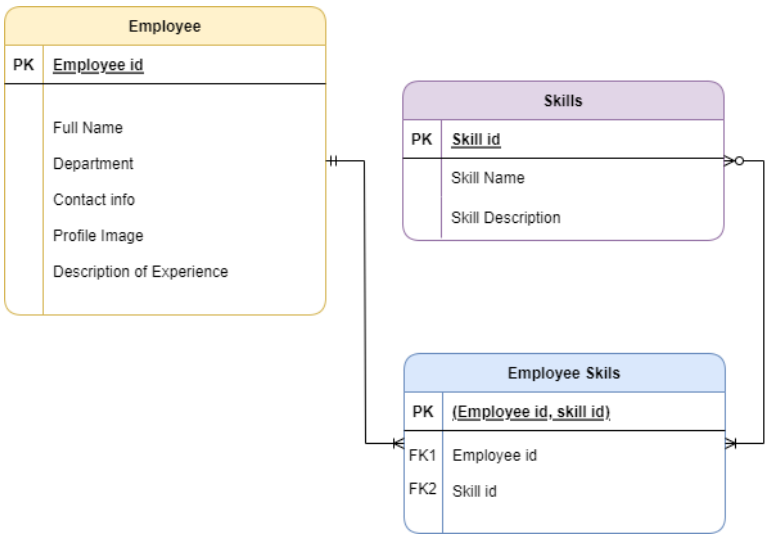

Figure 7: ER Diagram

4.6 Use Case Diagram

We employed a Use Case Diagram in order to clearly document the ways the end-users would engage with the skill-based search system. The diagram illustrates the way the functionalities of the system, appearing as use cases, enable one another in a way of mandatory reaction or possible, non-mandatory sub-actions. In our case, we have one primary user, namely Team Leaders/ Scrum Masters/ the company's employees. Although they might have different aims when engaging with the system, they all have the same use cases and therefore were grouped into one actor. We identified the following use cases;

- **Search Based On Skill**
  Initiate a search based on specific skills required for a task.

- **Going To An Employee's Profile**
  In case the skill search bears fruits, the list containing all matched employees will be presented. The user can enter the profile of each of the employees shown in the search results. As was entailed in previous paragraphs, the profile contains the description of the person, his contact information, and so on.

- **Set Up A Profile**
  Ability to create and manage their profiles, detailing their past experiences, skills, contact info, etc.

- **Modify Profile**
  In order to ensure the integrity of the profiles over time, the users have the ability to midify any misalignment they spot in it.

Use Case Relationships

- Include
  - There is no include relationship between the systems' use cases.

- Exclude
  - After the user engaged in a **Search Based On Skills**, the user has the option, but not the obligation, to **Go to an Employee's Profile**.

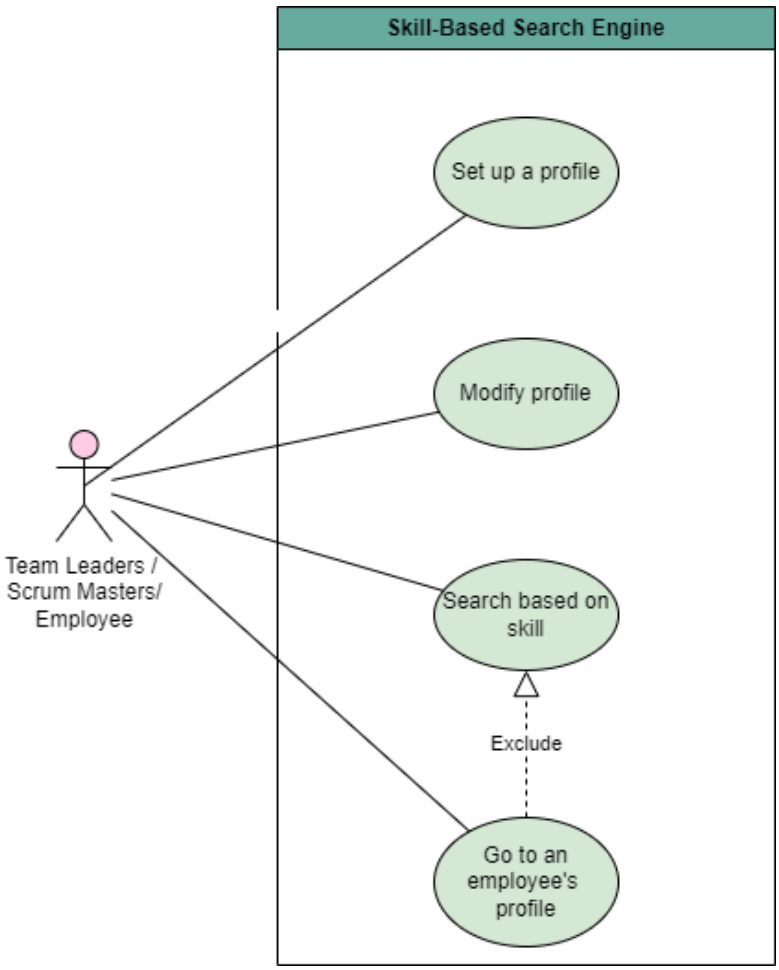

Figure 8: Use Case Diagram

4.7 Prototype

Utilizing the insights accumulated through our examination of the current state (AS-IS) and the desired future state (TO-BE), along with the specified requirements, we developed a prototype for the suggested solution. In the following, we will provide details about this prototype, as well as why we chose the features that it includes.

As seen throughout the AS-IS and TO-BE sections, the work system faces mainly these problems that we can potentially solve with our prototype:

1. **Insufficient Information about Employees:** The information retained for each employee lacks details about their skills, hindering the company's ability to search for specific skills within the existing workforce.

2. **Lack of Standardized Processes:** The absence of a standardized procedure for filling positions and utilizing existing employees with specific skill needs leads to inefficiencies and significant time waste in the search process.

3. **Weak Interdepartmental Connections:** The company's environment suffers from poor personal connections between departments, impacting the flow of skills between different areas. While not necessarily critical for the company's continuation, it becomes a challenge for skill-based searches that rely on personal connections.

4. **Absence of Technological Tools:** The company lacks operating systems for skill-based searches, resulting in a lengthy and resource-consuming search procedure.

Now that we know which problems we are solving with the prototype, we are going to talk about the prototype itself. It is developed with a tool called Odoo. Odoo is a Belgian suite of business management software tools including, for example, CRM, e-commerce, billing, accounting, manufacturing, warehouse, project management, and inventory management (Wikipedia 2023), but we are going to use only a small application inside Odoo to develop the prototype. Using this tool, we were able to create a system that includes employees of a company, such as Team Leads and Managers, as the users of the system, having a set of skills for each user as well as the implementation filtering employees based on skills (see figure 10). As seen in figure 9 each employee inside this system has a profile that includes the information required to identify them (photo, email, skills, etc.) as well as a brief personal description.

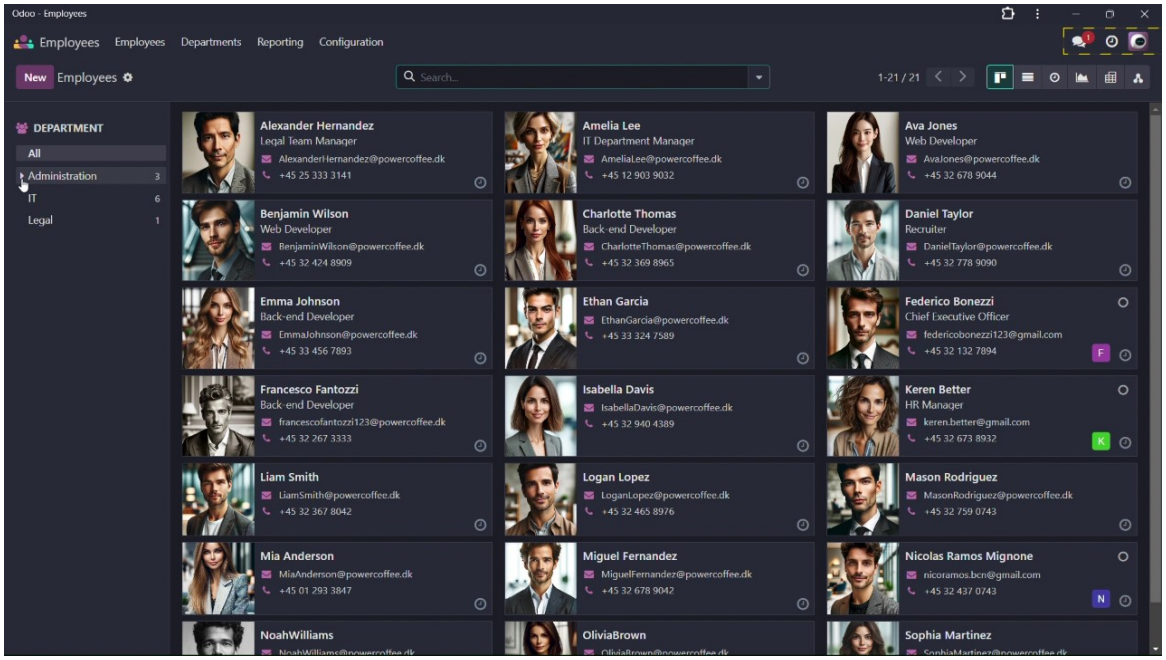

Figure 9: prototype main page

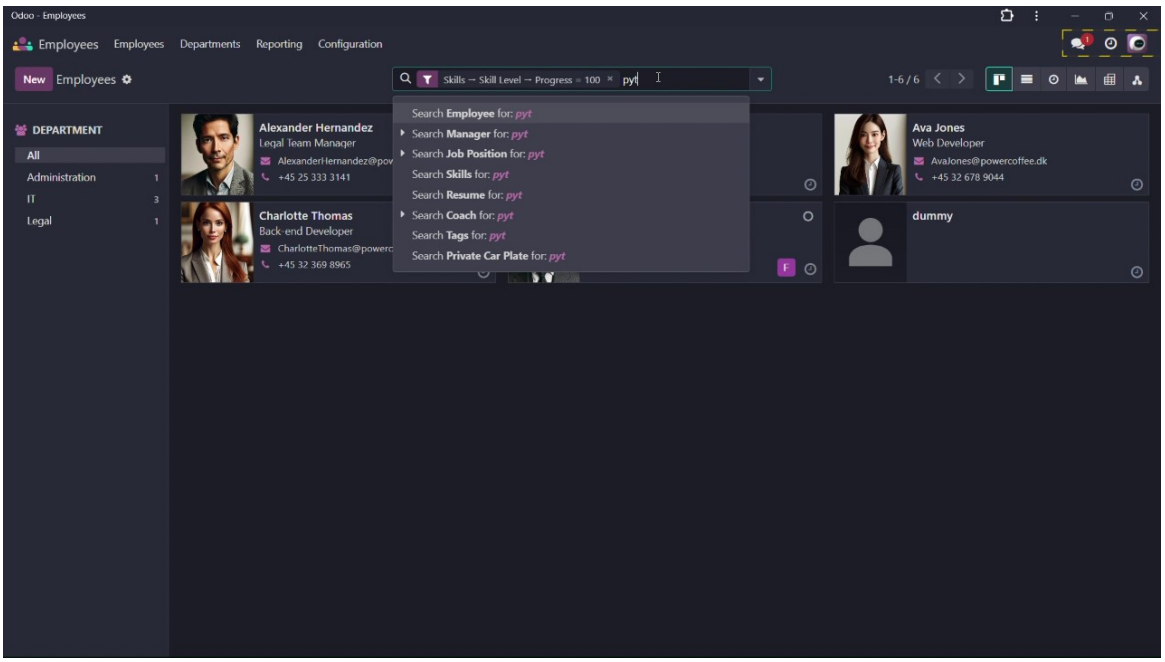

Figure 10: Search and filter based on skills

5 Cost-Benefit Analysis

After walking you through our recommended modifications, the subsequent section will delve into a cost-benefit analysis. This analysis, derived from the six steps approach outlined in *"Building Better Business Cases for IT Investments"* (Ward et al. 2008), allows us to identify the cost and benefits of our suggested system in a methodical and organized way. In this report, we have opted for a more readable and coherent presentation by providing directly the final cost analysis, achieved through the six steps, rather than guiding the reader through each individual step.

The analysis serves two primary purposes.
Firstly, it aims to identify and analyze the advantages of implementing our system, categorizing and evaluating them, to enhance the comprehension of the 'Skill-Based Search Engine' system's advantages.
Secondly, it intends to analyze the costs and risks associated with the modification of the current system to the system we created.

Please bear in mind that due to our restricted access to associated information, we lack empirical data for conducting this analysis. Consequently, certain information is inferred based on the AS-IS Analysis and the TO-BE Analysis or is based on information we gathered from online research about similar cases.

5.1 Business Driver

Through our interviews We were able to identify two internal drivers for the system.
To begin with, the current system does not facilitate a quick or reasonably straightforward process for retrieving skilled employees. This largely leads to a severe waste of time spent by the team leaders in searching for suitable workers. In the business context, time equates to money, and any time a team leader saves from the laborious task of workforce search translates into more time dedicated to daily tasks and assignments.

Secondly, as extensively elaborated in the paper, a drawback of the presently employed approach for skill-based searches is its reliance on personal relationships. This dependency may lead to overlooking employees possessing the required skills but lacking a personal connection with the team leader in need. Consequently, there are instances where a team leader might perceive a certain skill as absent in the company's workforce skill pool and resort to external recruitment. Opting for external sourcing is a financially burdensome decision and should be avoided if the necessary skill is indeed available within the company.

5.2 Investment Objectives

We pinpointed two objectives for the investment:

- Significantly minimize the time team leaders spend on workforce searches
- Mitigate instances where team leaders might mistakenly assume a skill gap and resort to costly external recruitment, consequently decreasing the amount of money spent on external hiring.

5.3 Benefits, Measures, and Owners

The next step answers the following questions:

1. What benefits will be gained by achieving the two objectives?
2. What metrics will be used for assessing each benefit?
3. Who is responsible for overseeing each benefit?

The table added below clearly visualizes the answers to those queries.

Benefit	Owner	Measure
Reduce team leaders' workforce search time	Team leaders	time tracking and survey
Decrease spending on external recruitment	Finance, HR	Compare spending on external recruitment before and after system implementation

Table 3: Identify Benefits, Measures, and Owners

Figure 11 offers auxiliary information on each of the benefits. It is evident that both benefits fall under the 'Do Things Better' category, as neither of them results in a cessation of behavior nor the creation ex nihilo of one.
In contrast, when it comes to the Explicitness of the benefits' values, each benefit falls within a distinct class. The Financial value of a decrease in spending on external recruitment can be calculated by applying a financial formula and thus it belongs to the 'Financial Benefit' class.

Contrarily, while it is feasible to measure the current workforce search time and potentially implement a metric to track it, the exact performance improvement (i.e., the reduction in search time) cannot be precisely estimated until the changes are implemented. Therefore, it aligns with the definition of 'Measurable Benefits,' where the exact improvement is uncertain despite the ability to measure the performance aspect. (Ward et al. 2008)

		Types of Change		
		Do New Things	Do Things Better	Stop Doing Things
High ↑ Degree Of Explicitness ↓ Low	Financial Benefits		**Benefit:** Decrease spending on external recruitment **Measure:** Compare spending on external recruitment before and after system implementation **Owner:** Finance, HR	
	Quantifiable Benefits			
	Measurable Benefits		**Benefit:** Reduce team leaders' workforce search time **Measure:** Time tracking and survey **Owner:** Team Leaders	
	Observable Benefits			

Figure 11: Tryg's Business Case

5.4 Quantifying Benefits: An Approximate Evaluation

In the following paragraphs, we present a quantification of the benefits. This is an approximate assessment of the benefits' explicit value through assumptions and calculations rounding.

- **Temporal Benefit**

  In the absence of official documentation, accurately determining the time spent on skill-based searches is challenging. Insights from interviews suggest that this extended timeframe is influenced by the procedure's reliance on waiting for responses from each employee to confirm their possession of the required skills. Furthermore, when a team leader is unfamiliar with a worker with the necessary skills, the process may involve reaching out to colleagues and other team leaders to identify potential candidates to contact, introducing additional delays.
  Consequently, given the current method of qualification-based search, it is reasonable to assume that the process may span over several weeks.
  The suggested system would enable the user to swiftly identify workers possessing the required skills with a simple click of a button, allowing the team leaders to directly proceed with checking for their availability for the task. This streamlined process eliminates weeks of laborious searching, offering a more efficient and time-saving solution.

- **Finantial Benefit**

  When it comes to exploring external resources as a result of an unsuccessful internal skill-based search, companies typically consider two main options, namely external consultancy and employee hiring. We will now outline the expenses affiliated with each option.

  External consultancy

  According to ImpactConsultingHub, *" (...) for EU development cooperation consultancy assignments, experienced experts (10+ years experience) can earn 800 EUR per working day (update: some other contacts in EuropeAid contractors suggest this figure is closer to 500-600 EUR). Junior experts (3-5 years experience) can earn around 400 EUR (update: some other contacts in EuropeAid contractors suggest this figure is closer to 200-250 EUR)."* (Hub 2023). When converted to DKK, this translates to a daily cost of 3700-6000 DKK for experienced experts and 1490-2930 DKK for junior experts.
  On the other hand, TrigeminiConsultants presents a different pricing range. They state that *"The typical price range is within DKK. 750, – 1.200 per hour. That does not mean it can't vary to one other side. A standard development task is inherently cheaper than eg. An architecture or teaching task."*(Trigemini 2023). Considering an average workday of 7.4 hours in Denmark (HQ 2023), a quick calculation shows us that ImpactConsultingHub's figures suggest that hiring a consultant in Denmark could cost a company 5550-8880 DKK per day. This range exhibits higher minimum and maximum costs compared to the figures provided in the previous article.

It's worth noting that this article, is specific to Denmark, and may offer more accurate figures for the local context than the previous EU-focused one. However, we find both articles together provide a more covered picture of reality.
In addition, TrigeminiConsultants introduces an essential consideration in selecting a consultant—the impact of the consultant's expertise on task duration and end-product quality. They caution that *"Naturally you will find vendors (including offshore) that can provide for a significantly lower price. Remember, however, that savings of eg. 20-40% isn't cheaper if delivery takes correspondingly longer time and with less quality."* (Trigemini 2023)

Employee Hiring

As mentioned by BoundlessHQ *"There is no official Danish minimum wage, but generally, a minimum of around 110 Danish Krone (DKK), or around USD 16.60, per hour is an informally agreed-upon standard."* (HQ 2023). To facilitate a comparison between the costs of employee hiring and external consultants, this hourly cost can be converted to a daily expense, resulting in 814 DKK per day.
BoundlessHQ further details the social security contributions that employers are expected to pay in 2023:

Contribution	**Expenses (DKK)**
ATP Pension	2,271.6
Maternity fund contributions	1,350 (estimate)
Injury insurance	5,000 (estimate)
Other social security schemes	5,300 (estimate)

Table 4: Social Security Contributions in 2023

When these monthly expenses are aggregated and divided by 22 (the average working days in a month), the additional cost per day per worker amounts to 632.8 DKK. Combining this with the daily minimum wage, the total expense reaches 1,446.8 DKK.
It is noteworthy that skilled employees are expected to receive payments higher than the minimum wage.
BoundlessHQ also identifies additional payments that employers might have to cover, including paid leave, overtime, and severance pay.
Lastly, Based on RemoteCountryExplorer *"Approximately 90%* of employers in Denmark also offer an occupational pension plan. (*based on 3rd-party market research from our partners)"* (*Remote Country Explorer - Denmark* 2023).
They also add that *"The typical pension contribution in the market is 12% per employee per year. The percentage is calculated from the employee's yearly base salary only."* (*Remote*

Country Explorer - Denmark 2023)

As a consequence, ensuring the company is well-informed about the existing skill set within its workforce and actively working to minimize reliance on external hires, the company could potentially reduce costs by at least 1446 DKK per day for each employee identified internally instead of seeking external candidates. If the system aids in discovering even five skilled employees who might have been overlooked otherwise, the cumulative daily cost savings would amount to 1446 DKK$\times 5 = 7230$ DKK. Over the span of a year (assuming approximately 220 working days), this could translate to savings of approximately 7230 DKK/day $\times\, 220$ days $\approx$ $1,590,600$ DKK.
Keeping in mind that this is the minimum optional cost, assuming the employee is willing to accept a minimum wage and excluding additional expenses like paid leave, overtime, and severance pay, we can infer that these savings could be even more substantial.

5.5 Costs

Regarding the associated costs, it's essential to consider both the initial implementation expenses and potential periodic maintenance costs over time. The initial phase involves the upfront investment required for the system's implementation, encompassing aspects such as software development and system integration. Additionally, it's prudent to anticipate non-frequent maintenance costs that may arise to ensure the sustained functionality, security, and optimization of the implemented system. These maintenance expenses, although intermittent, play a crucial role in guaranteeing the system's long-term reliability and effectiveness.

Investment Costs	**Amount ($)**
software development	$150'000
system integration	$50'000
storage	N/a
Security	$26'000
Training costs	$60'000
Total	$286'000

Table 5: Investment Costs

- **Software development**. Looking at some online sources, "How to Estimate Custom Software Development Cost in 2024" and "Human Resource Management (HRM) Software Development: Cost & Benefits". The price of developing a CRM is estimated to be around $100'000

to $600'000, where $100'000 is a basic software and $600'000 is more advanced and contains a lot of features. We estimated that our system cost is $150'000 since the software does not require many features and it is pretty basic to make.

- **system integration**. According to Serge Ybanez, writing an article on system integration, the cost integration of our system is absolutely not excessive and we would argue it is decently low (Ybanez Serge Ybanez). Our system is very basic and simple. It does not have complex features and it is very straightforward. For this reason, we estimated a low system integration cost. However, we acknowledge that we do not know if it will be compatible at all with the other systems or tools TRYG is using. Ergo, if it is not very compatible the cost of the integration could exponentially increase.

- **Storage**. It is impossible in this case to estimate the costs of the Storage in our project. It can vary depending on many factors involved; however, we believe these costs won't be high since there is not too much data to store and it won't have a great influence on the total investment cost. Due to these factors, we have decided that omitting the storage costs in the cost-benefit analysis will not affect its result.

- **Security**. According to Krystal Triumph, "companies spend around 10% of their annual IT budget on cybersecurity" (Triumph 2022). Due to our limited access to specific information regarding TRYG's IT budget, we have opted to estimate security costs at 10% of the overall investment cost.

- **Training costs**. Training costs can fluctuate depending on many factors. One of these is the complexity of the software created and its user-friendliness for employees to use. Our system is straightforward to use and only has a few features where it is not self-explanatory and may need a professional trainer to teach employees how to utilize them. For this reason, we believe the cost of training is about $60'000, A sum that allows hiring a few employees for about three months in order to train the permanent TRYG employees on how to use the system.

5.6 Risks

On top of presenting the benefits of the system, and acknowledging its inherent costs, it is rather crucial to recognize its possible risks as these risks could potentially affect the system's success in incorporating into the company's workflow. The table added below demonstrates the considerable risks we identified.

Risk Category	Risk Factors
Technical Risks	
System Complexity	The complexity of designing an efficient system for storing and managing diverse skill data.
Data Security and Privacy	Risks of handling sensitive employee information.
Data Accuracy	Risks associated with inaccurate or incomplete skill data.
Financial Risks	
Implementation Costs	Higher-than-expected costs for software development and system integration.
Maintenance	Unforeseen maintenance costs to ensure the system remains up-to-date, secure, and compatible with evolving technologies.
Return on Investment	Uncertainty about realizing the expected benefits and achieving a positive ROI.
Organizational Risks	
Change Adaptivity	Resistance to changes in workflows and processes.
Employee Engagement	Challenges in motivating employees to actively update and maintain their skill profiles.

Table 6: Risk Analysis Overview

5.7 Section Verdict

The envisioned skill-based search system holds the potential to deliver substantial benefits, particularly in terms of time savings and the reduction of external recruitment expenditures. This system, however, does come with noteworthy considerations, encompassing substantial implementation costs and the potential for technical and organizational risks. Based on our research findings, we maintain a positive outlook on the system's long-term benefits. The anticipated improvements in time efficiency and the reduction of external recruitment costs align with the identified organizational drivers. Therefore, despite the initial investment and potential challenges, we recommend proceeding with the implementation of the skill-based search system.

6 Implementation

In the upcoming section, we will delve into another crucial stage of Alter's Work System Life Cycle (WSLC), namely Implementation. Notably different from several other software development methodologies, Alter's implementation phase pertains to the incorporation within the organizational structure rather than the execution of algorithms on computers (Alter, 2004). The significance of delving into the implementation process cannot be overstated, as it sheds light on potential challenges a company might encounter when relinquishing a legacy system in favor of a new one. Gaining insights into possible obstacles and comprehending their implications for the adoption of the new system within the company can inform the selection of appropriate organizational strategies. This, in turn, facilitates a successful integration, minimizing deviations and challenges throughout the process.

6.1 Implementation approache

As we delve deeper into the intricacies of Tryg's current organizational landscape, it becomes evident that the absence of a legacy system or a standardized approach to skill-based search positions the company in a unique scenario. Unlike organizations with established systems in place, the integration of a new system at Tryg does not necessitate the discontinuation or termination of any pre-existing infrastructure. This distinctive characteristic sets the stage for a strategic approach that aligns with the organization's specific context.

In light of this, the conventional strategy of breaking down the integration into small, manageable modules and introducing it incrementally, as suggested by the Incremental Strategy, may not be the most applicable or efficient course of action. The rationale behind incremental implementation often revolves around the need to mitigate risks associated with large-scale changes. However, in the absence of a legacy system to phase out, the risk profile at Tryg differs significantly.

Additionally, the prospect of adopting a parallel approach, especially concerning the continuation of the current personal connection-based skill search, raises pertinent considerations. While parallel adoption offers a slower but less disruptive transition, its drawbacks, including heightened expenses, increased resource requirements, and functional recurrences, should not be overlooked.

Taking into account these considerations, we advocate for the adoption of the big bang transition strategy in this specific case. A big bang approach entails a swift and comprehensive shift to the new system, obviating the need for a phased or parallel transition. Given Tryg's unique organizational landscape, characterized by the absence of a legacy system and the current reliance on personal connections for skill search, a big bang transition aligns with the organization's needs and objectives.

This strategic recommendation aims to facilitate a seamless integration process, capitalizing on the absence of legacy constraints and fostering a more adaptive environment. By embracing a swift transition, Tryg can position itself to reap the benefits of the new system more expeditiously and, importantly, instill a culture of adaptability and openness to change among its employees.

6.2 Implementation theories

6.2.1 The adoption perspective

"Information systems implementation projects have historically been plagued by failures for which user resistance has consistently been identified as a salient reason"(Kim et al. 2009). It is evident that achieving a seamless adaptation to the new system requires minimizing the risk of status quo bias. We will now explore the elements' correlation, as proposed by Kim and Kankanhalli, particularly addressing those directly impacting user resistance, and draw parallels to the Tryg scenario.

1. **Perceived value has a negative effect on user resistance**
   When the advantages derived from the change outweigh the associated costs, leading to a higher perceived value, the resistance tends to decrease.
   In our scenario, as detailed in the cost-benefit analysis, the benefits of the change significantly surpass the costs, particularly in the long term, signifying a reduction in resistance toward the new system.

2. **Switching costs have a positive effect on user resistance**
   Switching costs comprise three factors: transition costs, uncertainty costs, and sunk costs. The preceding section thoroughly explored transition and uncertainty costs. As a reminder, sunk costs refer to commitments made for the previous system that are now left unused. However, in Tryg's case, there is no existing system for skill-based search, and apart from relying on existing connections, there are no skills acquired for the current procedure that would be lost during the integration of a new system. Consequently, there are no sunk costs, leading to lower resistance.

3. **Self-efficacy for change has a negative effect on switching costs**
   Our proposed system is designed to be intuitive and user-friendly, requiring no specific background or skills for operation. We anticipate that the majority of users will find it easy to understand and use, leading to a swift learning curve. As a result, we project a higher level of self-efficacy for change. According to Kim and Kankanhalli (Kim et al. 2009), *"High self-efficacy for change implies a lower perception of uncertainty costs and transition costs, such as learning. Therefore, self-efficacy for change may contribute to reducing the overall perception of switching costs"*. As pointed out in the previous point, switching costs positively affect user resistance, hence we predict a lower resistance on this regard as well.

4. **Organizational support for change has a negative effect on user resistance**
   Our paper is founded on the discussion we have had with René Thorny, Tryg's Business Analyst and Configuration Team Lead. Based on the interviews we have had with him, we observed a keen interest in the organization to establish the new system, and a commitment to facilitate all required changes. We therefore asses a lower user resistance.

For the reader's convenience, Figure 12 visually represents once again the relations conferred by Kim and Kankanhalli (Kim et al. 2009). It accentuates the connections between the elements of technological acceptance literature to the components of the status quo bias and the EIM elements. Serving as a supplementary visual aid to the original diagram, it also illustrates how the elements from technological acceptance literature impact user resistance, as discussed in the text.
The figure uses red arrows to indicate negative correlations between certain elements and green arrows to indicate positive correlations. The connections that are hypothesized in the text are visually represented with arrows labeled with "H" followed by a number, where the number corresponds to the hypothesis number in the text. If a hypothesis is not supported by the evidence, the corresponding arrows are colored grey in the figure.

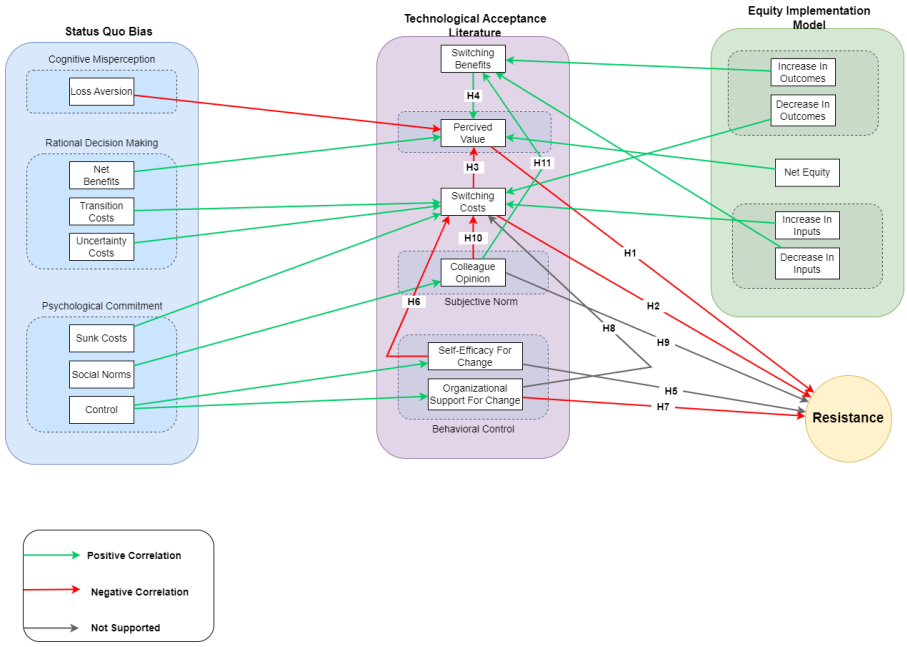

Figure 12: Status Quo Bias Theoretical Framework (Edited)

In summary, based on our analysis and observations, we are optimistic about the seamless adoption of the system. The thorough examination of various factors, including user resistance, organizational support, and self-efficacy for change, leads us to confidently project a smooth transition and integration of the proposed system. The alignment of our findings with established theories and best practices further reinforces our expectation of a successful and well-received implementation within the organization.

7 Conclusion

The examination of Tryg's Enterprise Systems and Information Management accentuates the crucial role of innovative technological solutions in facilitating operations and improving efficiency. The proposed implementation of a skill-based search system represents a strategic endeavor to optimize employee task alignment and resource utilization. This system is intended to revolutionize Tryg's operational dynamics, ensuring a more agile and responsive work environment. It establishes a commitment to endless improvement and adaptation that are necessary in a rapidly evolving business landscape, highlighting the importance of leveraging technology to uphold a competitive edge and accomplish organizational objectives. The study's findings and recommendations pave the way for transformative changes at Tryg, setting a pinnacle for modern enterprise systems management.

8 Appendix A

Unfortunately, the transcript of the first interview got lost due to an unexpected technical issue. But, thankfully, we could still maintain the most important information thanks to the field notes taken by us during the meeting.

This first interview was carried out with Trygs Business Analyst and Configuration Team Lead René Thorny, who helped us identify a work system inside the company by answering some questions as well as giving us some context about how Tryg functions in different settings.

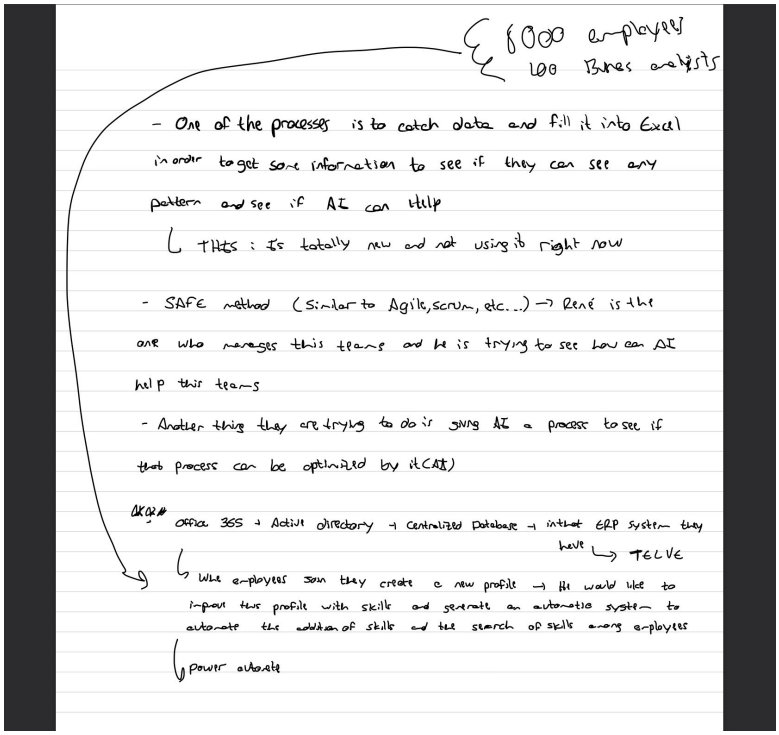

Figure 13: First interview field notes by Nicolás Ramos Mignone

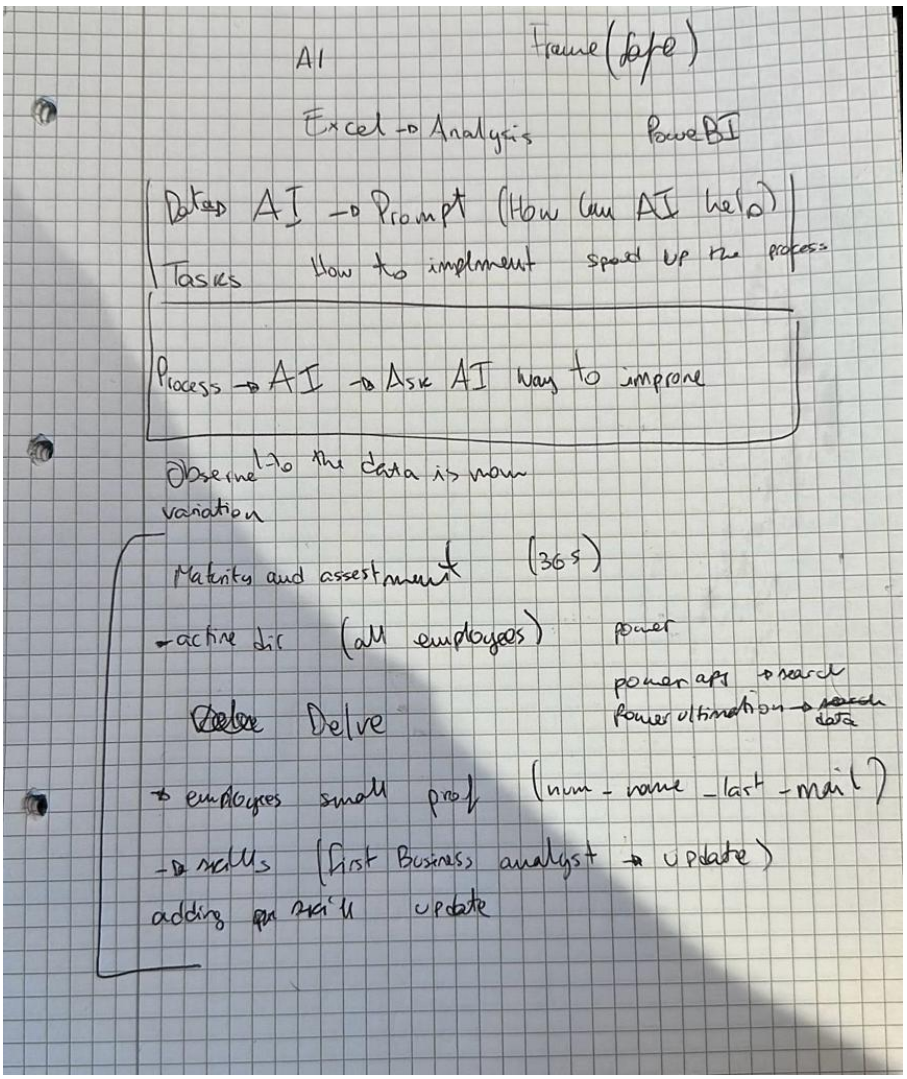

Figure 14: First interview field notes by Federico Bonezzi

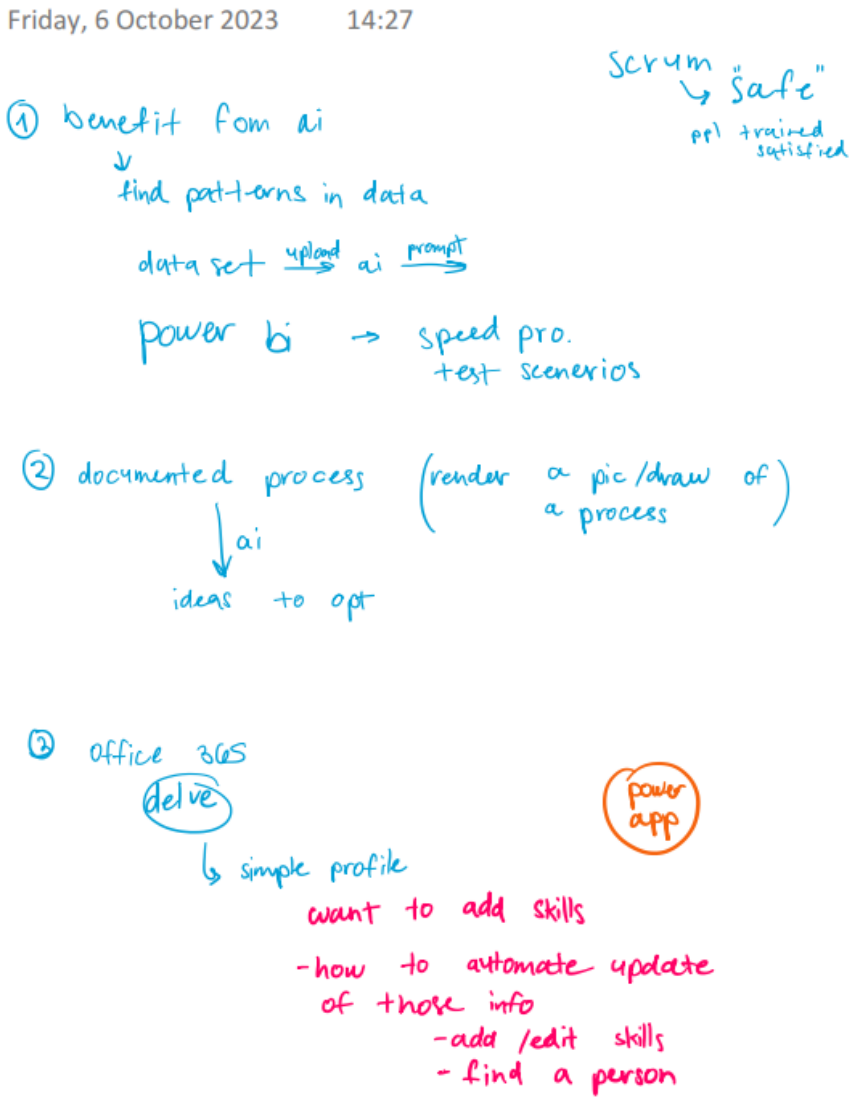

Figure 15: First interview field notes by Keren Better

9 Appendix B

Below is the transcript of the second interview set down with Trygs Business Analyst and Configuration Team Lead René Thorny.

Tryg follow up meeting

November 10, 2023, 18:04

1. Federico Bonezzi
   It's working alright, so we just have a some question to ask you to understand like the better understanding of a what we can do, what we cannot do, what we, what is best that we do and etcetera and that's it.
2. René Thorny
   Yeah, cool.
3. Federico Bonezzi
   I mean, we have this questions now.
4. René Thorny
   Yeah, perfect.
5. Federico Bonezzi
   All right.
6. Federico Bonezzi
   So Karen, if you want to start.
7. Keren Better
   How's that?
8. Keren Better
   OK.
9. Keren Better
   So the first question we have is how does the company identify the need for additional workers within the specific teams or projects?
10. René Thorny
    How do they?
11. René Thorny
    How they do they watch?
12. René Thorny
    Say the first thing again.
13. Keren Better
    How do they and they identify the need for additional workers in specific teams or projects?
14. René Thorny
    Uh.
15. René Thorny
    The additional workers?
16. René Thorny
    Yeah, as you are we talking about recruitment situation.
17. Keren Better
    Yeah.
18. René Thorny
    So in order. Yeah.

19. Keren Better
Inside.
20. René Thorny
Yeah, or.
21. Federico Bonezzi
Like the do you remember that like last time we talked about this thing that right now you have maybe difficulties, uh umm, finding employees with the right skill because you don't?
22. René Thorny
OK, now I know what you mean.
23. Federico Bonezzi
Alright.
24. Federico Bonezzi
Yeah, about that.
25. René Thorny
OK, so so so so within the company it's very difficult because you need to know someone you need to have been there for several years in order to know other people with those skills.
You don't have a general channel of GSO such thing like where you can just reach out towards the company and that's one of the main problems.
So actually you can if you send a sitting in one department and it might be that in another department you know 50 meters from you, there is a specialist, but you don't know.
There's especially stuff to do with what it so so it's it's mild mouth of here so knowledge. But.
There's no friendships, things like that. That's that's the whole scope of this.
So think about instead you.
You might have a situation where one person needs special competences.
26. Federico Bonezzi
Yeah.
27. René Thorny
They are looking internal in their own department and they don't have those skills and maybe they they then go for a a, you know, a external consultants to A to close the gap, the knowledge gap.
28. Keren Better
At the moment, are there any specific departments or teams that actively participate in skill identification activities?
29. René Thorny
No, not it's not a big thing, unfortunately.
Uh, no, no one else on the that's for my knowledge at least I will be the HR department.
But, but you know it's it's very overall it's very uh, OK, so do you have a role and you have an education, but you know it's not on the skill level.
30. Keren Better
Are there desk distinct responsibilities for team leaders? HR personnel or other employees during skill identification.
31. René Thorny
No, I don't think so.

32. Federico Bonezzi
Right.
33. René Thorny
So because what do you only thing you have right now is that whenever you are employed at work, you will they they will create a profile in Active Directory and 365 three, 6365.

Yeah.
And then when they have done that.
Uh profile will be added and 80 and you know this the the only skills that go.
I actually I think there is a integration into a a external for parts the HR.
Application which is synchronized with AD.
So it's only limited information that goes from the HR application to the AD, such as the email, the name, the, the title, the phone number, and not.
I'm not even sure that the phone number is says synchronized.

34. Federico Bonezzi
But so uh, HR or like any other departments, doesn't even have like the past work experiences so far.
35. René Thorny
Well, yeah, they they have.
They have what they what they've got from from the recruitment situation, but it's not in use.
36. Federico Bonezzi
Alright, OK.
37. René Thorny
Uh, you don't use those kind of information.
38. René Thorny
You're talking about the CV, for example.
39. Federico Bonezzi
Yeah.
40. René Thorny
I know that there's no replication from the Oracle or a scraping of those data withins enter profile not at all.
41. Keren Better
So the information on the CV is still kept like do you have an?
42. René Thorny
And I don't think that actually uh, about people unsure if they keep those information, maybe in my yeah, it might be a no it it is.
43. René Thorny
I'm pretty sure that it's there.
44. René Thorny
So that the profile they also uploaded the CV.
45. René Thorny
But I can find out that could be one of your things.
46. Federico Bonezzi
All right.

47. René Thorny
The question that I can get back to you with because I can I can easily look up one of my employees and see if I got the access to the information.
48. Federico Bonezzi
All right. Thank you. Yeah, that would be helpful.
49. Keren Better
What technological tools or platforms are currently used for skill identification or general communication?
50. René Thorny
None. There's there's no such thing as a skill identification to the company.
51. René Thorny
The only thing we have is the the, the free preinstalled Dell and the the Office 365 platform.
52. Keren Better
And usually, how do workers communicate with each other?
53. Keren Better
So you say that a person looking for some my worker within the company, he will go to people he knows.
54. René Thorny
Umm.
55. Keren Better
So how would you approach them?
56. René Thorny
So what?
57. Keren Better
How would he approach people he knows to understand if they have a certain skill?
58. René Thorny
Yeah, I actually think they know it by the by cooperation.
59. Keren Better
Umm.
60. René Thorny
So they have been in the same project or they have been talking about mostly it will be because people have been working on the same projects and then the by I've not coincidence, but it because it will not be a coincidence, but if someone in you know it could be let's say that you're going from an old system legacy system to a new system then you know who was working in the legacy system and you know who is going to build the new one. So in that way you would be connected so you know who got the the skills from and then when you start to burn them, better to know then you will, yeah it will get more information but it's it's kind of it's kind of tricky to do it actually.
61. Keren Better
It's kind of what?
62. René Thorny
It's it's kind of tricky to find out. Who knows what. I don't have any places where I can't look up people with certain skills, so I just, you know, I'm. I'll say, OK, if I need someone who knows while to enterprise architecture. OK, I will look for enterprise architect role. So someone with the title

enterprise architecture, but you know the the there could be a developer which would very strong knowledge about that or someone else. I know about enterprise architecture, but I'm pretty sure no one knows that.

63. Federico Bonezzi
Yeah, but by the way a question I have before asking other questions.

64. Federico Bonezzi
Ohh, last time we talked about this project and you suggested us to work with Microsoft Dev, AD, Power apps and Power Automata, right?

65. René Thorny
Yeah, it could be there could be some.

66. Federico Bonezzi
But do you want specifically asked to use that applications or we can alright, alright.

67. René Thorny
You can you, but it was just a suggestion. I remember when we talked the first time you said it needs to be an enterprise system and I thought it was. It was easier to kind of mention, you know it. Everyone knows about, so Office 365 and you got this. This suite of Nice application out of the box. You can come up with anything else so.

68. Federico Bonezzi
Yeah, that makes sense. Thank you.

69. Keren Better
So the next question is, who are the primary end users or customers of the skill identification system within the company? So basically, who would you think will use what?

70. René Thorny
That's a very, very broad question, because to be honest.

71. René Thorny
Anyone who are in the I would say anyone who works with project management.

72. René Thorny
Many managers.

73. René Thorny
HR department.

74. René Thorny
Uh people that are looking for future career development? Umm.

75. René Thorny
Also, people that you know, you know people that wants to market what they call promote their own skills for others in the company.

76. René Thorny
I think there are different views of stories there.

77. Federico Bonezzi
But mainly, what do you say?

78. Federico Bonezzi
May mainly. Team leads and managers probably.

79. René Thorny
Yeah, but, but normally it's not chinglish and managers that will that will do the investigation for certain skills. That's only if you want to refuse an external. You're not really looking into

recruitments. You're not trying to move a colleague from another department to to your own department. So I I actually think the most common way to do the skill a look up will be to would be for projects the Scrum masters. Could be people with a certain within a certain profession, like a a business analyst saying, OK, I'm sitting here with this problem. I need to integrate with the system but I don't know who knows about this system that would be kind of pretty cool to to do a lookup central and say OK we've got two persons that is pretty much expert within that area and the same goes for developers coding language. We have so many different coding language and that's very classical that you will get, then you will be at Java developer. But maybe you are professional, but Internet as well, but you don't know because in in Turkey you are you know. You are hired as a Java developer.

80. Keren Better
OK, now when I have some questions about the environment of the company and can you explain the typical channels of communication within the company?

81. René Thorny
Yeah, I can definitely do that. So and what you are talking about communication and talking about for both about internal and external communication?

82. Keren Better
Mostly internal.

83. René Thorny
So we are pretty much we are Microsoft House. So we are using all the typical uh tools teams. There's a there's a very, very big thing. That's like, so everyone uses Teams and channels SharePoint view the engage. That's that's common channels, that's.

84. Federico Bonezzi
They also use like for example, let's say you have been working for a long time in the company. Do collegues that you just text on WhatsApp?

85. René Thorny
Not really.

86. Federico Bonezzi
Alright.

87. René Thorny
We keep it formal because it's a, it's a part of the financial line of business which is which is you have some very heavy restrictions about compliance. So they made some very, very good choices here. Only stay at one platform, not have having too many options for communication. The compliance part is very strict. So yeah, if we have a yeah, we we have we have I think we have two or three departments offer where they are working with the with the law, GDPR and compliance, security and so on.

88. Keren Better
So you use mostly formal way.

89. René Thorny
Definitely, definitely.

90. Keren Better
OK.

91. René Thorny
Actually, you're mail was, it ended up in the spam. Uh filter. I needed to release your invitation. It was not allowed, so that tells you something about how strict it is.
92. Keren Better
Umm, how do you perceive the current availability of skilled workers? Do you feel like you have a an available? A lot of available skilled workers, or do you feel like if someone needs the worker with a specific skill, is hard to find? A worker that has free time for that task for another.
93. René Thorny
Yeah, but actually I think it's it's very it's very hard to to answer actually before we have the skill kind of tool because then we know for sure we don't have it. So I'm pretty sure that that we will recognize a lot of extra skills if it was visible and it was searchable. So I think that's question is easier to answer when you have the skill engine.
94. René Thorny
So you can see, OK, I think there is a lot of knowledge that or skills that are not in use today.
95. Keren Better
Umm, OK, how would you describe the strength of personal connections and network within the company?
96. René Thorny
I think it's a very good. Within the department, I think it's kind of poor between departments. It's a small silos.
97. Keren Better
And so you're saying. But it's it's difficult, it's difficult to say because within our department, for example.
98. René Thorny
We actually have a very good cooperation which, with the sales and with the, the, the, the claim handlers and that they are in other departments. So so within the project we have in the office, the program we're running, we actually have a really good connection to other departments. But if you go outside the program and I'll and between the departments, kind of, it's not very close.
99. Keren Better
And now about strategy strategies of the companies. How does the company balance internal skill development with external recruitment of efforts? Sorry, how does the company balance internal skill development with external recruitment efforts?
100. René Thorny
Uh, as a manager? Or I have a we have all the managers, we have a process where we to set up a personal goals or all the all the employees and we try to close the gap that we have and and in that way try to keep on developing ourselves and our department so. And I think right now it's it's more important than don't know about because it's getting really tough to get the competences, but it's at the skills the no, we're two people with the right skills and it's also very expensive. So I think it's getting more interesting now. To work within China.
101. Keren Better
So if you would say, would you prefer having one worker with many skills or or every time you have an you need for a person with a skill going outside and search for a specific person that has this one skill?

102. René Thorny
It depends on the how much I need that skill, so I don't need the skill, you know. Uh, that's that's that's taken example. Let's say that. Three, we have an old legacy system and we need to skill for that. I think we don't hire and have consultant will not try to educate someone to cover that. So it depends on the situation, yeah. For example, for example AI that's that's a perfect, perfect example one and educating everyone in working and understanding AI.
103. Keren Better
OK. Umm. How does the skill acquisition strategy align with the overall goals of the company?
104. René Thorny
But I was trying to explain that what do you mean with us?
105. Keren Better
So. Do you change the way you? So basically it's a question that, umm, depends on the other two questions about whether you prefer people from the outside or to reuse workers from within your company. Umm, so how does this change with changing goals of the company itself?
106. René Thorny
I think what we what we look into right now is that the other thing that needs to so educating people within the company but also. Also, a matter of this this line of business that that insurance claim area is is is quite it's quite hot to understand actually. So you need, you know that business itself each work with it for several years to understand how how it works, but it's very expensive to to go for people outside the company because they need to to learn. Alright, again, the chat, the business knowledge, knowledge to work indications. I don't know if that's answer your questions, so no matter what the strategy is, I think we will, we will stay with that. Always try to educate people before we should look for external.
107. Keren Better
OK.
108. Federico Bonezzi
By the way, isn't it uh?
109. Federico Bonezzi
So I saw your email.
110. René Thorny
Yeah, sure.
111. Federico Bonezzi
Yesterday, saying that right, I ask you if it was possible to interview maybe another Member to the company and you said that you are a pretty you.
112. Federico Bonezzi
You have a lot of work, of course, through right now.
113. René Thorny
Yeah, yeah.
114. Federico Bonezzi
So uh, it might not be possible.
115. Federico Bonezzi
Which is, which is completely fine, but it will be very useful to our project, right?
116. Federico Bonezzi
If we could.

117. Federico Bonezzi
The.
118. René Thorny
What kind of road do you want to do it?
119. René Thorny
Who could who could have been what?
120. Federico Bonezzi
So.
121. Keren Better
The When you we and we ask you the question, who would be the end users of the system you want?
122. René Thorny
Oh yeah.
123. Keren Better
Those are the people who would like to.
124. René Thorny
OK.
125. René Thorny
But then then maybe let me think.
126. René Thorny
I think I can find out how many.
127. Federico Bonezzi
It.
128. René Thorny
And each.
129. Keren Better
How as much as you think that it will be beneficial.
130. Federico Bonezzi
I mean, we don't wanna.
131. René Thorny
Let me see you. OK, so so you have so you have me. I'm I'm a regular manager. I have 14 in my team, 14 business analyst. So if we have this, uh, why area is very specialized, so it's it's pretty, you know if you have supply people with the knowledge so you won't be very cool for us. Uh, let me see if it could be the next one.There could be a scrum master. Maybe Scrum Master is very often in a scrum team, but they are. So what do you call it? They are in control of the and have the responsibility for assessment. Uh, So what are you looking into is what kind of do we have? The right thing we have the right skills and the to that. Does a scrum master scrum master Thomas so and so responsible assessment in response to and you should probably know some team that's really is the the the whole strength with the strong team is that you have all different kind of skill sets here. So you have to develop ours to have a business analyst, UX specialist and things like that. That would be a great use of this.
132. Federico Bonezzi
That would be perfect.

133. René Thorny
And then maybe and and and maybe alignment eager at my level that is covering developments.
134. Federico Bonezzi
Yeah, that we also be very good.
135. René Thorny
But I think I think two more if I can find two more for you.
136. Federico Bonezzi
Yeah, that tomorrow would be really, really perfect.
137. René Thorny
Would it be good?
138. Keren Better
Yeah, that will be perfect.
139. René Thorny
OK. OK.
140. René Thorny
I will go to that.
141. Federico Bonezzi
What I was about to say is that we it it will be better if could be an interview like this one, right? But if you really packed and you have a lot of work and so on, and they cannot participate, we could send them some question and they could answer manually.
142. René Thorny
Ohh yeah, yeah. Definitely possible, but yeah. But would would those two roles?
143. Federico Bonezzi
Yeah.
144. René Thorny
What would that be enough?
145. Federico Bonezzi
Yep, absolutely.
146. René Thorny
OK.
147. Federico Bonezzi
That would be the best.
148. René Thorny
But as as you can hear, actually I think there is a great potential and I think the cool thing with this, every company produce that no one does it.
149. René Thorny
There's no one does this.
150. René Thorny
It's really crazy, but no one does, just I only think it.

151. Federico Bonezzi
Yeah, but it's still it's so strange that no one does it because it's very useful as a thing.
152. René Thorny
Really strange.

153. Federico Bonezzi
You're right.

154. René Thorny
It doesn't make sense in a world where you know the human capacity is one of the most important thing in in a company is really strange that you don't keep track on the on the skills and you and you make it available to search for it. I only think it if you should compare with someone that might do it. It will be the consulting company. Uh, you know, professional consultants like could be a head company and other people that don't. But that's because they stay are selling people out of the house, you know? So you can hire a consultant, but they they keep really track on the conferences. You know everything about what you can do.

155. Federico Bonezzi
All right, Karen, do you have any other question?

156. Keren Better
No, I don't.

157. Keren Better
Unless you have anything else you wanted to add.

158. Keren Better
Do you have anything else you wanted to add?

159. René Thorny
I think one of the things that I'm looking into is what you can come up with when it comes to how how to catch the information and how to update information, how to integrate information.

160. Federico Bonezzi
So what I was thinking personally, but with this what I have in mind is not like final decision, right. Was that when a person gets hired, you list all his password experiences. You list all the current skills right? And then you store them with other information like names or name to understand who this person is and etcetera, right. And what happens is that after a while you either review this like for the skills, because skills can be as they can be learned, they can be forgotten, right? So after a while, there always will be a check if that employee still has the required skill or not, because if it loses the skill right, it's not beneficial to have the skill listed under him, and if he learns new ones he you can add them out like very easily in the system. Uh, that's like it's a very general view on what we have in mind, but I think that's could be one of the best implementation of the system.

161. René Thorny
I think one thing that you could consider is or might consider is two thing. Just the best thing about that, first of all, when you get the information from the employee at the first time, you got to see me and you got the, you got the resume and you got the application. What about if you somehow were able to OCR those information, or if they are in a format where you can read it very easily, you will catch all those information and you will run it through an API to make those details fit perfectly into the fields and delve for example. Same thing is what if what if when you have those information that you will automatically you will send out a request just a service mail or something like that for the for every employee. Did anything happen with your skills? Did you gain any new knowledge? Is there anything you need to change? Almost like the the job recruitment policy due they sometimes they send me a mail say OK, it's either it's time to update your CV. Please use 3 minutes to do it that the. Because what you definitely need to do here to

make it work is that you need to put the responsibility at the person themselves. No one needs to still need a essential unit to keep track on this. That would be too much work, but we need to automate this in a way I put the responsibility at at every employee themself. And I don't know if you can if you can work with some kind of a A honoring system saying, OK, you gained a professional patch or something like that or you know, thank you probably know more about that that you can get some kind of a ah you are very good at this. You are professional. You are or one of the VIP's here for updating your skills and gaining. You know it's that could be maybe the motivation for updating those information. Just just a ideas, you can look into it.

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