Bachelor's thesis

NTNU
Norwegian University of Science and Technology
Faculty of Information Technology and Electrical Engineering
Department of Computer Science

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Enhancing Social Learning Through Knowledge Sharing

Conceptual Framework and Prototype Development

Bachelor's thesis in Computer Science
Supervisor: Skundberg, Olav Alseth
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Abstract

This bachelor's thesis addresses the challenge of enhancing social learning within a corporate environment, in collaboration with the tech company Tietoevry. The current solutions used for communication and collaboration within the company do not facilitate social learning effectively.

To address these issues, the team gathered research from both internal and external sources. This was done through testing of current solutions, reading documentation and relevant articles, as well as conducting a survey among the employees. Using the knowledge gained from this research, the team proposed a solution to Tietoevry.

This solution was presented in the form of a concept that addressed key issues related to the current platforms. The concept captures key findings from the research to propose a theoretical solution. This solution proposes improvements to the user interface, filtration of content, and added gamification elements.

As an example of how this concept could be actualized, the team developed a prototype that implements key features from the concept. The idea was to provide Tietoevry with a concrete illustration of the ideas presented in the concept.

The results of this concept and prototype were evaluated through user testing. The participants were employees at Tietoevry. They tested the platform by completing predetermined tasks. The feedback from the participants was very positive, and the conclusion drawn from these tests was that there is value to the concept.

Sammendrag

Denne bacheloroppgaven tar for seg utfordringen med å forbedre sosial læring i en bedrift. Den er gjennomført i samarbeid med teknologiselskapet Tietoevry. De nåværende løsningene for kommunikasjon og samarbeid tilrettelegger ikke for sosial læring på en effektiv måte.

For å løse disse problemene samlet gruppen informasjon fra interne og eksterne kilder. Dette ble gjort gjennom testing av nåværende løsninger, lesing av dokumentasjon og relevante artikler, samt gjennomføring av en spørreundersøkelse med ansatte i bedriften. Denne kunnskapen ble brukt for å foreslå en løsning for Tietoevry.

Denne løsningen ble presentert i form av et konsept som adresserer nøkkelproblemer knyttet til de nåværende plattformene. Konseptet kombinerer hovedfunn fra forskningen for å foreslå en teoretisk løsning. Denne løsningen innebærer forbedringer av brukergrensesnittet, filtrering av innhold og tillegg av elementer som belønner brukere for å bidra aktivt.

For å gi en antydning på hvordan konseptet kan bli virkeliggjort ble det utviklet en prototype som inkluderer de viktigste funksjonene beskrevet i konseptet. Målet med prototypen var å gi Tietoevry et fysisk eksempel som representerer idéene presentert i konseptet.

Resultatet av dette konseptet og prototypen ble evaluert gjennom brukertesting. Deltakerne var ansatte i Tietoevry. Testingen bestod av spørsmål og utføring av forhåndsbestemte oppgaver. Tilbakemeldingene fra deltakerne var svært positive, og konklusjonen av testingen er at det finnes verdi i konseptet.

Preface

This bachelor's thesis concludes three years of study in Computer Science at the Norwegian University of Science and Technology (NTNU) in Trondheim. The topic of this thesis was selected due to our interest in working with a large corporation to see what kind of difference we could potentially make. We were eager to collaborate with Tietoevry and gain insights into how technology could be leveraged to address knowledge-sharing challenges in a corporate setting.

Throughout the project, we dived into theory, conducted practical research, and were guided by our supervisor and task assignor to better understand how to create a comprehensive platform that would centralize knowledge sharing. This journey, from conceptualization to implementation, provided us with valuable insights into both the technical and collaborative aspects of software development.

We would like to express our gratitude to Erlend Olsvik, the representative at Tietoevry, for his support and engagement throughout this project. We also extend our thanks to Olav Skundberg, our supervisor, for providing guidance and constructive feedback.

Finally, we would like to thank the participants of both the survey and user tests.

Aleksander Olsvik

Joakim Falch

Sander Olin Johansen

Project Description

This project was initiated in response to a need identified by the task assignor, Tietoevry:

> ”Tietoevry places great emphasis on knowledge sharing and competence development. Currently, there is a lack of a unified platform where knowledge sharing can occur in a way that facilitates effective collaboration. Information is scattered across various platforms, and the tools for social sharing in professional teams are not adequately suited for collaboration.”

To respond to these issues, the initial idea was to develop a new e-learning platform. However, within the first few weeks of the project, after initial meetings and preliminary research, it became clear that the creation of a new platform might not fully address the core issues at hand. The project then shifted to conducting a comprehensive analysis of the platforms used within Tietoevry to identify their shortcomings. This analysis aimed to uncover the root causes of why these platforms were perceived as unintuitive and less favored within the organization. Furthermore, the project endeavored to develop a prototype for an alternative solution. This prototype aimed to demonstrate how a more effective and user-friendly platform could be realized, avoiding the pitfalls of the other systems.

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Abbreviations

AI - Artificial Intelligence

API - Application Programming Interface

IT - Information Technology

ML - Machine Learning

NLP - Natural Language Processor

NTNU - Norwegian University of Science and Technology (Norges teknisk-naturvitenskapelige universitet)

Tech - Technology

UX - User Experience

UI - User Interface

1 Introduction

The purpose of this chapter is to outline the main challenges addressed by the thesis and describe the team's strategy for proposing a solution. Additionally, the chapter will detail the context of the challenges, articulate the problem statement and research questions, and present the structure of the thesis.

The theory of social learning, developed by Albert Bandura, highlights that learning occurs through observation and imitation of other people's behavior, and the consequences of their actions (Cherry, 2022). Social learning can also be applied to a corporate setting, where it can play a pivotal role in a collaborative work environment. By utilizing social learning in this aspect, employees acquire knowledge and skills not only through formal training programs but also through everyday interactions with their coworkers (ELM Learning, 2023).

In today's digital age, social learning has expanded into the world of "e-learning", where technology makes it easier and more effective to share knowledge. In order to utilize social learning for e-learning, organizations can use a variety of digital tools to support informal and peer-to-peer learning. Social platforms like Workplace from Meta, Microsoft Teams, and Slack enable employees to form groups, share relevant content, and participate in discussions that enhance their understanding of various subjects. These tools allow for the creation of specialized channels that encourage open dialogue and collaboration, making it easier for employees to ask questions, share experiences, and find solutions together.

Tietoevry is a digital services and software company that provides IT solutions across multiple sectors. With roots dating back to 1968 and headquartered in Finland, Tietoevry serves customers globally, focusing on digital transformation and innovation. The company consists of about 24,000 people with customers in more than 90 countries (Tietoevry, 2024). With such a large workforce dispersed across various locations, effective tools for knowledge sharing and collaboration is essential. The lack of a comprehensive solution for social learning can lead to difficulties in unifying employee knowledge and ensuring efficient information flow across the organization.

1.1 Background

While social learning has transformative potential in the corporate environment, Tietoevry faces difficulties due to their current platforms not supporting this learning model enough. The absence of comprehensive platforms limits the potential for its employees to share knowledge and collaborate seamlessly.

The problem, as articulated by the task assignor, revolves around the absence of a central hub for knowledge sharing that can support effective collaboration. Currently, Tietoevry engages in social learning through the "70:20:10" model, which emphasizes that 20% of learning should come from social interactions. Tietoevry employs multiple platforms such as Workplace, Teams, and Cornerstone (internal tool) to facilitate social learning. However, the dispersal of information across these platforms results in inefficiencies, with employees struggling to locate relevant resources, maintain consistent communication, and engage effectively in the learning process. Furthermore, the

tools for social sharing within professional groups are not adequately designed for collaboration. This lack of specialized support for group-specific interactions prevents the full realization of collaborative learning and the efficient sharing of specialized knowledge within the company.

1.2 Problem Statement and Research Questions

To address these challenges, the following problem statement and research questions were considered to guide the creation of a solution:

> How can an organization facilitate social learning by ensuring that information sharing is centralized, accessible, yet relevant and supportive of collaboration?

To solve this problem, the focus was on two key questions that would assist in identifying strategies to address the main problem:

Research question 1: Which features and attributes do employees consider important for a social learning platform, and how do these features align with the shortcomings of existing platforms used in the organization?

Research question 2: How can the information available on platforms like Workplace and Teams be analyzed, organized, and generalized to support cohesive integration into a new social learning platform?

The result of this thesis, and the answer to the problem statement, will be a concept that proposes an alternative solution to the current situation. This concept is a theoretical framework that outlines potential improvements and strategies to address the identified challenges. To demonstrate how this concept can be applied in practice, it will be supplemented with a functional prototype.

1.3 Thesis Structure

The rest of this report is structured to highlight important factors relevant to this project:

- **Theory (2):**

  This chapter presents relevant materials that are useful for understanding the problem and potential solutions. The theory serves as the foundation for the final concept that was developed.

- **Methodology (3):**

  The methodology chapter describes how the results were achieved. It includes the team's process, decisions, and assessments, providing insight into how the results came to be.

- **Results (4):**

  This chapter presents the project's findings and results from the methodological approach applied to solve the problem statement.

- **Discussion (5):**

  This chapter analyzes the results, their implications, and how they relate to existing theory and research.

- **Conclusion and Future Work (6):**

  The conclusion summarizes the insights gained from the project and outlines potential future directions.

- **Societal Impact (7):**

  This chapter explores the broader implications of the project's findings for society, highlighting the value it could offer beyond the immediate research context.

2 Theory

This chapter provides an overview of the theoretical frameworks relevant to the project. By exploring existing theories within the field, this overview lays the foundation for understanding the methods applied to address the problem statement. Additionally, these frameworks lay the theoretical foundation for producing and analyzing the results from this thesis. The chapter will describe essential topics related to social learning, as well as explore design and development practices that can be applied to address the problems identified throughout the project.

2.1 70:20:10 Model

The 70:20:10 model is a framework for learning and development that displays an ideal ratio for how people learn effectively: 70% from on-the-job experiences, 20% from social learning, and 10% from formal learning (Arets, 2016). This model is recognized and used in the field of human resource development to help with the challenge of effective learning and development. The percentage split is not definite and should be adjusted based on the company that is using it. Social learning, as defined in the 70:20:10 model, emphasizes learning that does not come from completing tasks on your own but rather in communication and interaction with others. This includes mentoring, coaching, collaborative projects, discussions, and observation of peers or experts. The underlying principle is that individuals can enhance their knowledge and skills by interacting with and contributing to their social environment, learning from the experiences and knowledge of others.

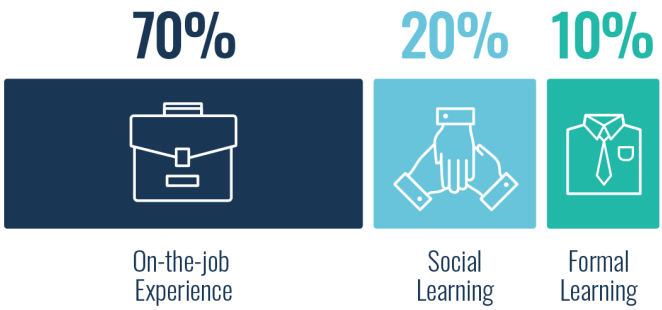


Figure 2.1: 70:20:10 Model (Cloke, 2024)

The ability to communicate, discuss, and update learning experiences has been shown to boost productivity by up to 35% (Cloke, 2024). This highlights the importance of human connection, especially in companies with remote workers.

In the context of remote work, where physical interactions are limited, creating a collaborative and interactive learning environment becomes a necessity. Effective ways to communicate and share knowledge allow employees to provide insights, offer feedback, and support each other's learning journeys.

2.2 Corporate Learning Culture

Corporate learning culture is characterized by commitments made within an organization to continuously improve and develop its employees (Andreatta, 2022). This culture entails both formal learning and informal learning that happens through daily interactions and activities.

A robust learning culture inspires employees to actively pursue new knowledge and skills, creating an atmosphere where curiosity and innovation thrive (SKYbrary, 2024). This environment supports continuous personal and professional growth across all levels of the organization. It is marked by a collective belief in the importance of learning as a crucial factor for both individual development and organizational success. Some important factors for creating a culture that promotes learning are:

Leadership Commitment
The support and involvement of managers in building a corporate learning culture are essential to succeed (SKYbrary, 2024). By actively participating in learning activities, top leaders can provide an example for the employees to follow.

Provide Feedback
A strong corporate learning culture supports regular feedback (SKYbrary, 2024). Although this feedback tends to be positive, providing constructive feedback on negative aspects can contribute severely to professional growth. Having a culture where failure is allowed creates a healthy environment for employees to prosper in.

Recognize and Reward
In addition to providing feedback, actively recognizing and rewarding instigators of this creates an incentive for others to also engage in continuous learning (SKYbrary, 2024). Rewards and recognition can include certifications, career advancement opportunities, and public acknowledgment.

Provide Learning Opportunities
Companies should provide employees with a variety of learning opportunities to help them develop themselves (Learning, 2019). This can be facilitated through online courses, workshops, or peer-to-peer learning. Making these activities accessible and meaningful can motivate employees to engage in continuous learning.

Continuous learning is not only important for employees to develop their skill sets and be of more value, it is also beneficial to the company, as it is shown that companies with good learning cultures have happier employees (Dewar, 2023). In addition, 79% of Learning and Development professionals agree that it is less expensive to reskill a current employee than to hire a new one.

Reports have shown that opportunities for growth and learning are considered a top factor for a great work culture (Andreatta, 2022). This demonstrates the importance and motivation for companies to focus on developing their employees. The need for a good corporate learning culture also enhances the capacity to adapt to changes in environments, innovate, and maintain a competitive edge.

2.3 Scrum

Scrum is a framework within agile project management used to facilitate the development of complex products (Scrum.org, 2024). It is based on the principles of transparency, inspection, and adaptation, guided by the idea that teams and individuals should continuously evaluate their work to efficiently tackle unpredictability and solve complex problems.

Key elements:

1. Roles:
    - **Product owner:** The product owner is responsible for the product goal. They set the priority for functionality and monitor the overall process.
    - **Scrum master:** The scrum master acts as a facilitator for both the product owner and the development team. The Scrum Master ensures that the team follows Scrum practices, participates in Scrum ceremonies, and addresses barriers to progress.
    - **Developers:** The developers are the ones actually developing the product. They follow the backlog instructions for the given sprint and adapt to the challenges that arise.
2. Events and ceremonies:
    - **Sprint:** A sprint is a period of time where a set amount of work should be done. A sprint often has a goal that is being worked on. For example: Get a working prototype available for testing.
    - **Sprint planning:** Sprint planning is the event that starts a Sprint by deciding what work should be done for the Sprint. This meeting addresses what can be done in the Sprint and how that work will be achieved.
    - **Daily scrum/Stand-up meeting:** These meetings are 15-minute events for the development team to synchronize activities and create a plan for the next period of time before the next stand-up.
    - **Sprint review:** A sprint review is Held at the end of the Sprint to evaluate the period and change the Product Backlog if needed.
    - **Sprint retrospective:** This ceremony occurs after the Sprint Review and before the next Sprint Planning. It is used to evaluate the Sprint that was and what changes should be made for the next Sprint.
3. Artifacts:
    - **Product backlog:** A product backlog is an important artifact for scrum projects. It is an ordered list of everything that is known to be needed in the product.
    - **Sprint backlog:** The sprint backlog is the set of Product Backlog items selected for the Sprint.

(Srinivasan and Maloney, 2024)

2.4 Kanban

Kanban is a framework for project management developed in the late 1940s by Taiichi Ohno for Toyota's production system (Radigan, 2024). The word "Kanban" itself means "signboard" or "billboard" in Japanese. It was designed to increase efficiency within a project. Over time, Kanban has been adapted for use in various other industries, particularly in software development and IT operations, where things such as a product backlog can easily be adapted to fit the methods of Kanban.

"A Kanban board is an agile project management tool designed to help visualize work, limit work-in-progress, and maximize efficiency (or flow)" (Rehkopf, 2024). The board is set up with columns and cards to track progress in a development process. The columns represent activities that together make up a workflow. Examples of column names can be: backlog, in progress, and complete. In this way, project members can get a clear view on how the process is developing and what tasks remain.

2.5 User Experience

Usability is a crucial aspect of any application, directly impacting its success and adoption. Ensuring a positive user experience is essential for encouraging actual use. Usability and user experience are key terms in the professional field of design. UX, short for user experience, refers to the overall experience the end user has when encountering a product (Norman and Nielsen, 1998). Understanding what good UX design involves is a complex topic, as a *good* user experience is not uniquely defined. It can rely on a variety of variables and will also vary from person to person. This raises a question: What are characteristics of a good user experience, and how can this be provided?

2.5.1 Good User Experience

Due to personal preferences and different perceptions, defining what a good user experience is can be challenging. There are, however, some characteristics that can be found in many of current applications that are commonly regarded as benefactors of a good user experience. Laws of UX is a website that displays some important principles that can be applied when designing an application (Yablonski, 2024e) to enhance the user experience. These laws have their roots in human psychology and explain how these psychological principles can be used to facilitate a good user experience. Several of these laws are relevant when designing a platform for social learning that focuses on a good user experience, and three of them are presented in the following segments.

2.5.1.1 Jakob's Law

> "*Users spend most of their time on other sites. This means that users prefer your site to work the same way as all the other sites they already know*" (Yablonski, 2024b).

This law states that users of your application will spend most of their time on other

applications, which causes them to expect your application to work in a similar manner to theirs. By taking advantage of this, designers can enhance the user experience of their platform by making users focus on their tasks rather than getting familiar with a completely new platform that looks and works differently from other similar platforms (Yablonski, 2024b).

To accomplish this, important features and design principles must be extracted from other platforms that users might be familiar with. Two examples that illustrate this very well are social media platforms and online shopping sites. No matter what social media platform you are on, the designs will usually be quite similar to one another.

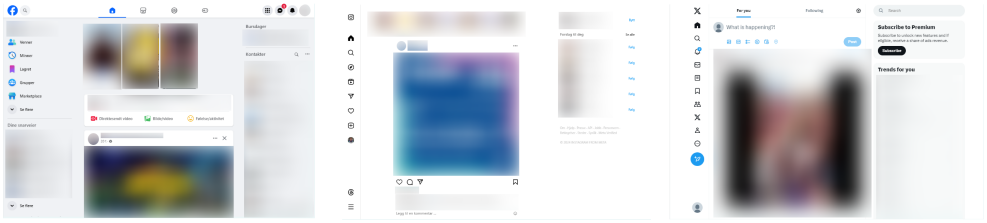
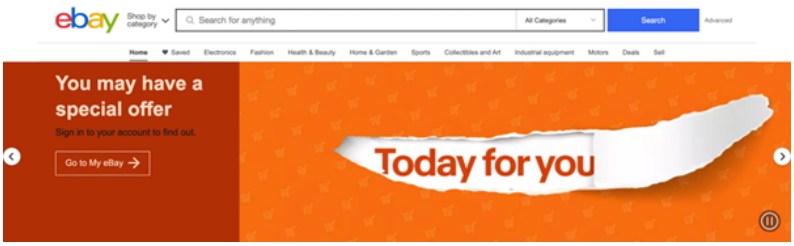


Figure 2.2: Facebook, Instagram & Twitter (X) Home Pages
From (Facebook, 2024), (Instagram, 2024) & (Twitter/X, 2024)

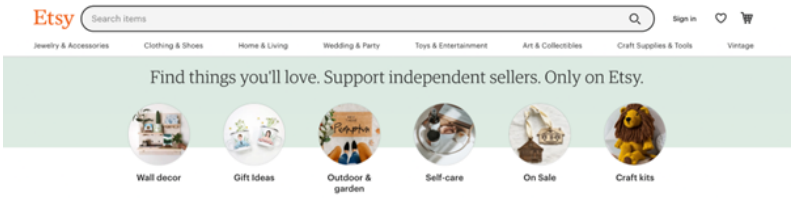
These three images in Figure 2.2 show the home pages of three well-known social media platforms: Facebook, Instagram, and Twitter (rebranded as X). Although each platform has its own distinct visual style and branding, there are several similarities in terms of functionality and navigation. Each platform provides a sidebar on the left for navigation, ensuring quick access to key features like messages, notifications, and profiles. Their logo, placed in the top-left corner, serve as a convenient "Home" button that redirects users to their primary feed.

At the center of the screen, each platform displays a personalized feed filled with posts from friends, people you follow, and other relevant users. Despite variations in layout, all three feeds encourage user engagement through consistent interaction options: liking, commenting, and sharing. The icons for these actions have become standardized between platforms, with familiar shapes and symbols representing these functions, making it easier for users to transition between platforms without needing to relearn basic interactions.

Additionally, each platform includes a right-side column featuring a mix of additional recommendations, suggested connections, and trending topics. These secondary content areas encourage further exploration and provide opportunities for discovery beyond the main feed, enriching the overall user experience.



(a) Ebay layout



(b) Etsy layout

Figure 2.3: Layout of two online stores, (Morneau, 2022)

The example in Figure 2.3 highlights the top sections of the home pages for two major online stores, eBay and Etsy. Despite the differences in their branding and design, both follow a similar pattern and layout. They each feature a prominent search bar at the top for easy product discovery. Below the search bar, eBay promotes special offers and personalized recommendations, while Etsy focuses on categories like wall decor, gift ideas, and craft kits. Both platforms aim to provide a streamlined shopping experience by offering intuitive navigation and personalized content right from the homepage, making it simple for users to find and explore products that match their interests.

These two examples display Jakob's Law in practice. Websites with similar functionality and target audiences usually look and feel the same. This ensures that users do not spend time learning new models but rather spend time on what you want them to. In the case of online stores, the retailers want users to spend most of their time actually purchasing products rather than navigating and figuring out how the website functions. This shows that good user design is both helpful and necessary for the user, but also for the provider of the service. By limiting the amount of time users are not shopping in an online store, the retailer can maximize their potential revenue.

2.5.1.2 Law of Proximity & Law of Similarity

> **Law of Proximity**: "*Objects that are near, or proximate to each other, tend to be grouped together*" (Yablonski, 2024c).
>
> **Law of Similarity**: "*The human eye tends to perceive similar elements in a design as a complete picture, shape, or group, even if those elements are separated*" (Yablonski, 2024d).

The two laws quoted above provide an insight into how humans tend to group similar

objects together, as well as groups that are proximate to each other. Both of the laws originate from a branch of psychology called Gestalt, which studies how the human brain seeks patterns in images and structures (Bustamante, 2023).

This impacts the overall user experience, as it affects how people interact with components to complete a task. These laws exhibit two different ways of grouping elements of a website together, and this is important for building a complete image of the page in front of you. By combining these laws, a designer can group buttons with similar actions or targets together using both placement (proximity) and design (similarity).

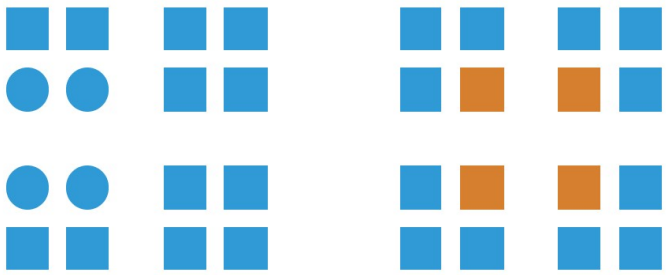


Figure 2.4: Use of both proximity and similarity to group objects, (Stepanova, 2024)

Simply by using different shapes, colors, or spacing, different objects with identical content can be grouped differently. In web design, this is a crucial part of creating intuitive and user-friendly interfaces that are easy to interact with. By understanding what components of the website belong together, the user can complete their tasks without being disrupted or disturbed.

In the first illustration of Figure 2.4, there are four clear groups located in the corners created by applying the Law of Proximity. There is spacing between all the objects, even those in the natural groups, but by keeping the grouped objects more proximate to one another, they are differentiated from the elements in the other groups. When looking at the image, it is also natural to group the objects that look similar together. This can be applied to the blue circles, as they seem to be sharing characteristics.

In the second illustration of Figure 2.4, the four orange squares look as if they are grouped together as well, despite being in four different groups by the Law of Proximity. This is an example of the Law of Similarity, or the lack thereof (Stepanova, 2024). By having similar objects appear as a group, small changes to these squares make them stand out. This figure combines the effects of both these laws to illustrate how small design choices can change how the overall image is viewed.

These laws can be applied in practice, and can essentially be found in every well-functioning website today. A practical example can be found on Amazon's website. Their website uses different colors and placements to showcase the most important and valuable features of the site. This is shown in Figure 2.5.

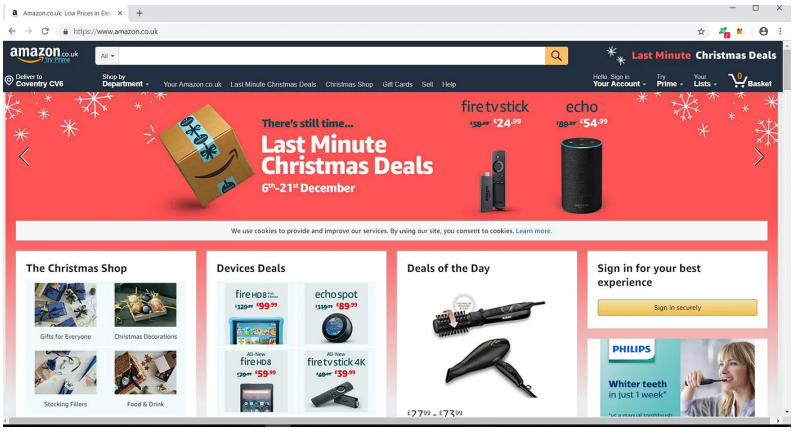


Figure 2.5: Amazon's website has elements that display the use of Law of Proximity and Law of Similarity, (Incharaprasad, 2023)

A great example of color usage, and therefore the Law of Similarity, is the orange background of the search icon, which makes it stand out from all the other buttons. By applying this law, the search button and search bar are distinguished from the rest of the navigation bar, and the focus is naturally drawn to them.

The distinct placement of navigation links on the top left and profile/shopping cart links on the top right are examples of the Law of Proximity in use. This is a common approach for placing links, and by adding spacing between the groups, there is a clear distinction between the purposes of the links.

All in all, these laws have been applied to the Amazon website to provide users with an intuitive interface that allows them to navigate to their desired page with ease.

2.5.1.3 Aesthetic-Usability Effect

> "*Users often perceive aesthetically pleasing design as design that's more usable*" (Yablonski, 2024a).

The Aesthetic-Usability Effect is a UX design principle that highlights the influence visual appeal has on the perception of usability (Yablonski, 2024a). The principle states that when users interact with an aesthetically pleasing design, they are more likely to find it user-friendly and effective, even if its actual usability and functionality are worse. This effect accentuates the importance of a well-designed interface when attempting to enhance user satisfaction and engagement.

This principle suggests that the visual appeal of a design can create positive responses, which in turn can affect the user's experience and perception of functionality. When users find an interface visually appealing, they are more likely to be patient with minor usability issues and more forgiving of potential flaws. This psychological effect can lead to a more enjoyable and satisfactory user experience.

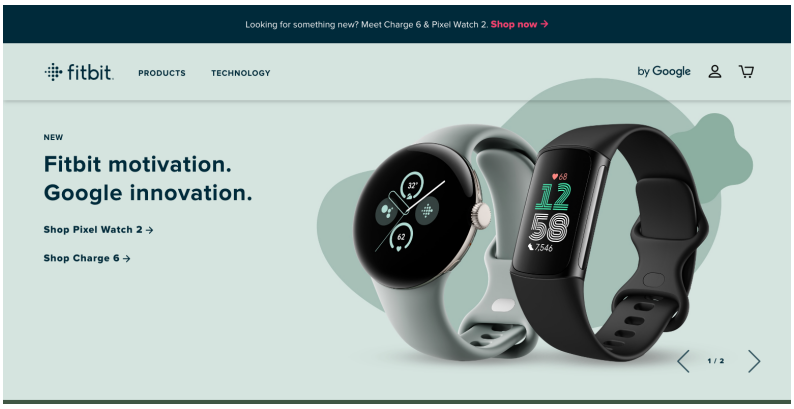


Figure 2.6: Fitbits website provides an aesthetically pleasing design (Moran, 2017)

The image in Figure 2.6 displays the homepage of Fitbit. The website has an interface with a clean and modern design. The colors combine well, and the layout is well-organized. The overall design is visually appealing. This design likely leads to a positive user experience, making users perceive the application as functional and user-friendly.

During a usability test of this website, a user encountered issues with navigation and other interactions (Moran, 2017). Despite these issues, when reviewing the website, the user rated the website's usability very high. Their responses to the website were all related to its aesthetic appeal, covering up the fact that the tasks were completed with difficulty. This is an example of how the Aesthetic-Usability Effect can create a perception of usability by having a visually pleasing design.

To apply this effect in practice, designers should focus on creating visually appealing interfaces that align with user expectations and preferences. This involves considering factors such as color theory, typography, spacing, and alignment to create a cohesive and attractive design.

Additionally, it is important to maintain a balance between aesthetics and functionality. While the visual appeal of a website is important, it should not compromise the usability and performance of the application. The goal is to create an interface that is both visually appealing and easy to use, ensuring that users have a positive and efficient experience.

In summary, the Aesthetic-Usability Effect emphasizes the significant impact of visual appeal on the perception of usability. By designing aesthetically pleasing interfaces, designers can enhance user satisfaction and engagement, ultimately leading to a more successful and effective application.

2.5.2 The Effects of Good User Experience

As illustrated with examples, there are several ways in which the general user experience of an application can be improved by design choices. The problem description highlights an issue with the user experience in the current platforms. Due to this,

good user experience is desirable for a new platform. But why is this so important?

The effects of good user experience extend beyond mere functionality, profoundly impacting social interactions on digital platforms (CoStrategix Contributor, 2020). A well-designed UX fosters a sense of community and connection among users by creating intuitive and engaging interfaces that facilitate communication and collaboration. When users find it easy to navigate and interact within a platform, they are more likely to engage in meaningful social interactions, share content, and provide feedback. This sense of ease and satisfaction encourages users to return and participate regularly, enhancing community building and user loyalty.

Moreover, a positive UX promotes inclusivity by accommodating diverse user needs and preferences, thereby supporting a broader range of social interactions (CoStrategix Contributor, 2020). By incorporating features that enhance accessibility and usability, designers can ensure that users from various backgrounds and abilities can interact seamlessly, fostering a more inclusive digital environment. Additionally, well-implemented UX design can support real-time communication and social engagement, which are crucial for maintaining strong human connections in an increasingly digital world. Through thoughtful design choices, such as usability testing and user-centered design, platforms can create environments where users feel valued and understood, ultimately strengthening social bonds and enhancing the overall user experience.

When creating a user-based application, the main focus should be the end-user. Although the programmer who creates the application may understand its logic and can navigate through pages and functionality at ease, this is not necessarily true for the targeted users. Similarly, the designers of the page may think the page is visually pleasing and therefore works well for them, but this does not guarantee the same experience for the users. It is important to understand who the end users of an application are, so that the interface can be designed to suit these users.

2.6 Application Programming Interfaces

An application programming interface, commonly know as an API, is a set of rules or protocols that enables software applications to communicate with each other to exchange data, features, and functionality (IBM, 2024).

An API endpoint is a specific address where an API interacts with a server to perform a function or access a resource. Each endpoint corresponds to a specific functionality, allowing users to send requests to and receive responses from the API. In this context, a request is the action done by the client to retrieve or send data to the server, a response is the server's reply, containing the requested data or result of the request.

APIs play an important role in building complex software systems. They hide the complex details of the implementation while offering a way to access data. This means developers can access these APIs without needing to dive into the code that creates the structures behind them. APIs also enable companies to share their services for broader use. By enabling external sources to access data via APIs, they open up use cases that would not be available without them.

The effectiveness of an API is determined by the quality and extensiveness of its documentation. Detailed documentation is important for developers to understand the

opportunities of an API, including its available endpoints, data formats, authentication methods, and error-handling procedures. Well-documented APIs make it easier for developers to access the data and enable faster integration.

2.7 Machine Learning

”Machine learning (ML) is defined as a discipline of artificial intelligence (AI) that provides machines the ability to automatically learn from data and past experiences to identify patterns and make predictions with minimal human intervention” (Kanade, 2022). This broad definition includes a range of techniques and models, each designed to process and analyze data in ways that mimic human learning to some extent.

Machine learning and artificial intelligence are not new concepts; however, the usage of both has increased drastically over the last decade and is predicted to grow even more in the next decade (Reports, 2023). The applications of these technologies are numerous and have already contributed to changing countless industries. In the industry of computer science, the implementations of AI and machine learning reflect a shift towards data-driven decision-making and problem-solving.

2.7.1 Classification Model

A classification model is a type of machine learning model utilized for decision-making and problem-solving (Keita, 2022). These models are used to classify categorized data. When receiving new data, the model is used to predict which category they belong to. To better understand how a classification model works, it is important to understand what supervised learning is.

2.7.1.1 Supervised Learning

In supervised machine learning, the models are trained on labeled data. Essentially, this means that the input data (features) are paired with the corresponding output data (label) (Google Cloud, 2024a). The label can be the expected category or class. Models using supervised learning attempt to learn the relationship between the input and output, and use this to predict the label of new input. An example of labeled data is images of trees labeled with their species. The image represents the features, and the species represents the label.

To evaluate the accuracy of a trained model, a separate test dataset is used. This dataset consists of a number of feature records (images of trees) and their corresponding label (species of the trees). By applying the model to predict the label of these features, the model can compare them to their actual labels to gradually learn which features are the most important for the specific feature set (Bakved, 2022). This kind of learning is generally used in classification models.

2.7.1.2 Uses of Classification Models

As explained, classification models and supervised learning can be used in combination to learn the relationship between the features of some data and their labels.

A practical example where a classification model can be used is for recognizing spam email (Keita, 2022).

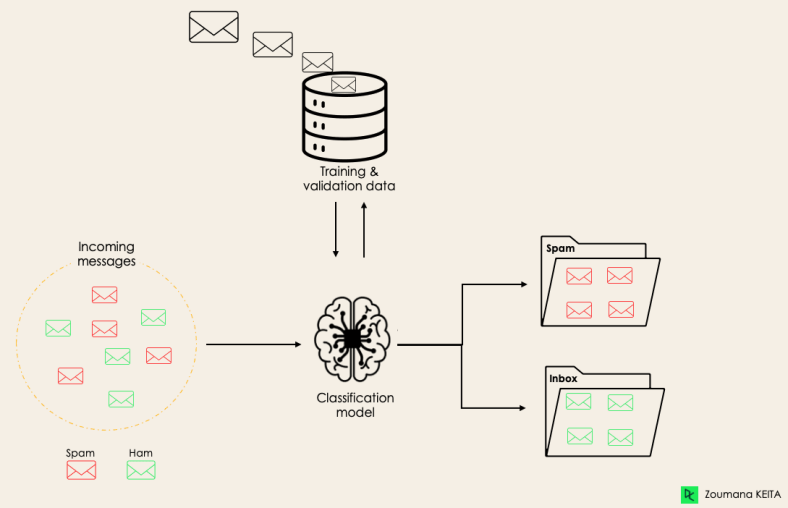


Figure 2.7: Usage of a classification model to categorize mail, (Keita, 2022)

As illustrated in Figure 2.7, the model receives emails of different categories as input. After training and testing the model on labeled data, the model should be able to categorize an arbitrary email as spam or not spam.

3 Methodology

The methodology chapter outlines the structured approach taken by the team to develop a concept and create a prototype solution in response to the problem. It explains how the team decided to collect data and apply it to a solution.

3.1 Research Method

Research methods are tools and techniques used to collect, analyze, and interpret data. Figure 3.1 illustrates the overall research process framework used in this project. It categorizes various research strategies and their corresponding data generation and analysis techniques.

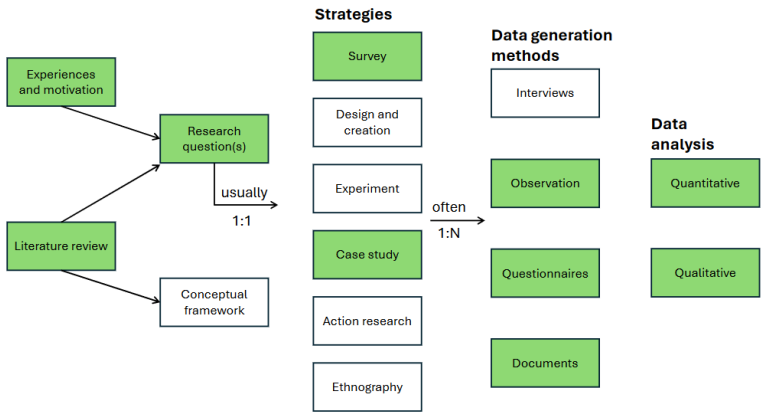


Figure 3.1: Research model for the project, based on Fig. 3.1 Model of the research process, from (Oates, 2006), p33

To address the research questions, as defined in "Problem Statement and Research Questions" (1.2), the team utilized the strategies of surveys and case studies, with each method specifically chosen to address the corresponding research questions. The highlighted boxes represent the strategies, data generation, and analysis methods that wre utilized.

For Research Question 1, which explored important features of a social learning platform, a survey strategy was employed. A questionnaire was used to gather quantitative data from employees about their preferences and experiences with existing platforms, as detailed further in "Survey" (3.4.1).

For Research Question 2, which looked at how information from platforms like Workplace and Teams could be organized and integrated into a new social learning platform, a case study method was used. This approach included a qualitative case study to review how content is managed on these platforms. The data generation methods involved observing how the data visually appeared on the different platforms and comparing it to how it was structurally extracted through the APIs.

3.2 Defining Problem Statement and Research Questions

The initial phase of the bachelor project aimed to establish the goals and constraints of the project. This involved defining the problem statement and formulating research questions. The reasoning behind this stage was to reach a consensus on the main objectives of the bachelor's thesis. This was achieved through collaboration with the task assignor and the bachelor supervisor. It was vital for all parties involved to share a common understanding of the project's objectives, which enabled everyone to move collectively towards the same goal.

The goals and constraints of this project were largely determined by the task assignor, Tietoevry. The problem the company sought a solution for involved inefficiencies in communication within professional teams and the effective facilitation of social learning. This issue, as detailed in "Background" (1.1), was decisive in shaping the project's goals. Although the initial problem description may not have been part of the final objective, it served as a foundation for defining the problem statement. There were several reasons for selecting a different path, but the main one was input from the bachelor supervisor. This input guided the team in a direction that better addressed the problem at hand. The final problem description was formed by combining the various suggestions with the students' knowledge. This thorough approach set a strong foundation for the thesis work.

3.3 Work Process Flow

After defining the problem statement and research questions, the team had to plan the work process. It was clear that the work should be structured into phases. The team decided upon three main phases: Data collection, Data application, and Data evaluation. This decision was derived from the structure of the problem statement and research questions. Before producing results, there was a need to collect relevant data and information. The team had an initial idea of what the general issues at Tietoevry were, but how these could be addressed was still unclear. The procedure for solving the general issues, and what the flow of the process looked like, is displayed in Figure 3.2. How these stages and tasks were completed is further described in the coming subsections.

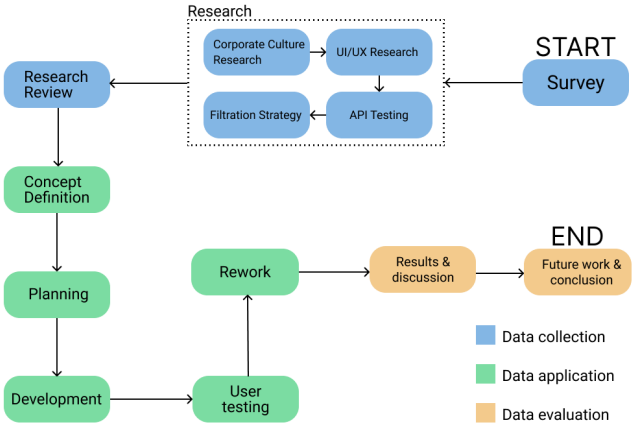


Figure 3.2: Overview of the research method and process flow, divided into three stages

3.4 Data Collection

With a structured plan of how the workflow should look like, the team began its work to further understand the problem at hand. This was done by completing several tasks, with the main goal being to gather knowledge about the issues and possible solutions.

Figure 3.3 illustrates the data collection process, starting with a survey, which led to a series of research activities. This culminated in a research review, providing the foundation for creating a concept.

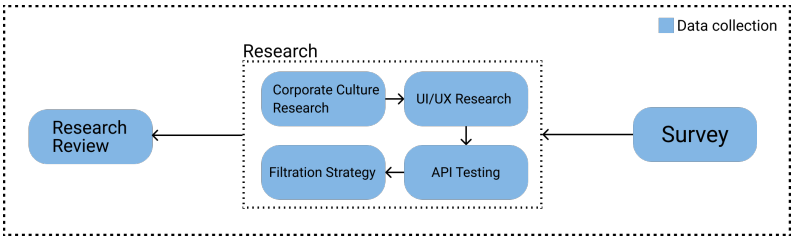


Figure 3.3: Data Collection

3.4.1 Survey

The team conducted a survey to get a better understanding of the current situation. This was done through the survey strategy shown in Figure 3.1. Data for this research strategy was generated through a digital questionnaire that was published on one of Tietoevry's internal platforms. The survey questions were based on initial un-

derstandings and project objectives, and sought to link results directly to the defined problem statement.

The survey was closely connected to Research Question 1, which focused on important features and problems with social learning platforms. The aim was to gather comprehensive feedback on the strengths and weaknesses of the existing platforms as perceived by the users. By evaluating how well specific statements aligned with employees' views, the survey identified the aspects of the platforms that they found most beneficial. This was used to determine which elements should be retained, improved, or re-imagined in the new development. This approach was designed to ensure that the creation of a concept was substantiated by real user experiences. It aimed to proceed with the positive attributes of the current situation while addressing its shortcomings, to deliver a solution that is both effective and in line with the users' needs and preferences.

3.4.1.1 Part 1: General Opinion on Current Platforms

The survey consisted of two main parts with different targets. The first part of the survey aimed to gain a better understanding of the situation by providing statements about the user experience and functionality. The participants answered to what degree they agreed with the given statement. By receiving answers to these statements from the participants, specific to each platform, the team could form an image of the general opinion. Some of the statements raised, with answer options, were as follows:

The platform...

is useful

is simple to navigate

shows me relevant materials

Strongly disagree	Disagree	Neutral	Agree	Strongly agree	I don't use it
○	○	○	○	○	○

3.4.1.2 Part 2: User Needs and Requirements

The second part of the survey aimed to identify in detail what made the users agree or disagree, and how this could possibly be improved. Another objective of this part was to ascertain the relevance of the thesis. To address these goals, there were four questions raised:

- What, if any, are your biggest issues with the current platforms?
- What are the most important features for a social learning platform, in your opinion?
- How important is social interaction and co-operation for your learning?
- If a new platform was to be developed, would you be open to try this out?

The first two questions aimed to identify shortcomings of the current platforms. The main goal was to determine what features would be important for the concept as well as possible pitfalls. This was done by asking what is currently lacking and what the participants want from such a platform. The objective was to identify features that the users feel are lacking in the current solutions. These features will be important when combined with external research to design the final concept. This question was multiple choice with an option to add a custom answer. This made it possible to understand which features should be prioritized and identify potential features that had not been considered.

3.4.2 Research

To solve the redefined problem, the team had to proceed with the research described in this subsection. It was important for the team to combine the results from the survey done at Tietoevry with information from external sources to produce the best results and create a product that could be of general interest. The survey identified issues and areas for improvement that were relevant to the problem, but without more information, it was still unclear how this knowledge could aid in the design of a concept. The following segments present the four main research topics, as described in Figure 3.2.

3.4.2.1 Corporate Learning Culture

To understand the different aspects of learning culture and what drives the motivation for social learning, the team researched the theory and practice of learning culture. Understanding these concepts and what triggers the aspects of social learning was important to comprehend how the parts of the prototype should be weighed.

After researching and gaining a better understanding of learning culture as a whole, the focus then shifted to understanding the learning culture within Tietoevry. Tietoevry's culture code consists of four codes with respective guidelines supporting each code. The one the team is addressing in this thesis is the *Keep Learning* code. The guidelines for this code are shown in Appendix A.

3.4.2.2 UI and UX

When designing a product for a large user mass, two critical factors are its appearance and user experience. An ideal product balances both of these to create a visually pleasing product that users enjoy interacting with. Understanding what this meant in practice was an integral part of designing a new social learning platform.

The methodological approach to understanding and answering the question of how UI/UX design principles can affect a social learning platform was divided into two steps: finding relevant materials and observing popular web applications.

When researching these topics, articles and blog posts from sources such as Medium, Nielsen Norman Group, and Laws of UX were read and examined. The main goal

was to gain a comprehensive understanding of design principles, laws, and guidelines, and how each of these elements impact the overall user experience.

To ensure an in-depth perception of the encountered design principles, the examples provided in the articles were studied. In addition to the provided examples, the team did research beyond this to view other designs and observe what design principles are applied, and how these effects are perceived.

The decision to observe platforms that involve social interaction, such as Instagram and Reddit, had an additional purpose. This was grounded in Jakob's Law (UX Law stating users spend more time on other websites). By reviewing these platforms and finding out their main ways of working, these could be extracted and implemented on their own. Specifically, these are the platforms that were reviewed:

- Instagram
- Reddit
- Facebook
- Facebook Workplace
- Microsoft Teams
- Twitter / X
- LinkedIn
- Github

The goal was to create a brand-new interface using well-known elements to provide a familiar feeling for new users. In making the prototype similar to what the users already know, the users have an easier time of learning how the prototype works, which helps direct users' focus to the essence of the designed prototype.

3.4.2.3 API Testing

To answer Research Question 2 about organizing and generalizing data from existing platforms, the team conducted research and testing of the available APIs. The APIs tested were Facebook Workplace Graph API (Meta for Developers, 2024), and Microsoft Graph API (Microsoft Learn, 2024a). This was done to gain a better understanding of what information was possible to obtain through the APIs, and how this could be used in developing a new solution.

To address this question, the team considered what the two different APIs had to offer, as well as how the fetching of data from these APIs differed. This was evaluated against the expected features of a social learning platform, and compared to the information displayed on social platforms like Facebook, LinkedIn, Reddit, and Teams.

The team created users on the relevant platforms for API testing, Workplace and Teams, and added test data to these. This data was intended to be as realistic

as possible by mimicking actual user data. This provided the team with a visual representation of the data to be extracted through the APIs.

Following the creation of groups and users, the team started reading documentation on the different platforms. These APIs were well documented for the most part, so finding out how to extract specific types of data was generally uncomplicated. In the cases where this was not straightforward or explicitly stated in the documentation, the team resorted to forums and real-life examples to find an answer.

The method for testing these platforms involved using an API platform to test the available functionality. This involved sending requests to access a variety of data and observing what data was accessible. The data that the team wanted to access was generally related to users, groups, and posts which was driven by the research question.

The output from the APIs was used to identify what fields were common from the different platforms, and what fields could be used in the prototype. This was an important part of figuring out how to organize the data from the different platforms and how the team was going to display this with useful information.

3.4.2.4 Filtration Strategies with Machine Learning

One of the main problems the team sought a solution for, was to reduce the noise from non-academic content on the current platforms used for social learning in Tietoevry. This was driven by the desire to keep content relevant, as stated in the problem description.

The platforms include a large number of groups and channels that are useful for communications, but not for learning specifically. There is no categorization of these groups, so when fetched through an API, there is incoming data that is not valuable for social learning. Due to the lack of categorization, judging whether a given group is for academic purposes or not relies exclusively on the group name. To reduce overhead of fetching and displaying groups with irrelevant content, there was a need to filter away such groups. To address this challenge, two main filtration strategies were explored.

Machine Learning for Filtration
It was decided in the early parts of the project that the team wanted to explore the possibilities of using artificial intelligence to improve the process of data management. The challenge of categorizing groups was one that the team regarded as feasible to utilize machine learning to solve.

When dealing with natural language, the purpose of the group may not always be apparent based on the name alone. The purpose of a group can change based on how the name is phrased and what words are combined to create the full group name. By utilizing artificial intelligence's decision-making abilities in an almost human-like manner, the team hoped to achieve a more robust and less word-sensitive filtration solution.

Therefore, machine learning was identified as a technology that could become very useful when dealing with data of groups and channels with different structures to

classify them as academic or not. The team looked into known models that use natural language processing, like OpenAI's ChatGPT and Anthropic's Claude AI (Google Cloud, 2024b). Testing of these for categorization purposes seemed promising, and the team was interested in moving forward with one of these.

One of the main challenges when looking into existing models was the financial limitations of these. These models did not offer sufficient free trials that would allow for extensive experimentation without incurring substantial costs. After explorations, the team came across the AI solutions available on Microsoft Azure. The free trial on this platform was more comprehensive than other platforms while offering a number of services.

The two main solutions explored were Microsoft Azure OpenAI and Microsoft Azure Machine Learning, chosen for their ability to leverage cloud computation. This provided the team with scalable and robust computing resources, aligning well with the project's requirements and ensuring efficient processing and flexibility. Azure OpenAI allowed integration with OpenAI's models, though it follows a billing structure similar to direct API access (Microsoft Learn, 2024b). In contrast, Azure Machine Learning offered a broader set of tools tailored for developing, training, and deploying machine learning models comprehensively (Azure, 2024).

After evaluating the technical features and access conditions of both, Azure Machine Learning with its Automated Machine Learning (AutoML) emerged as the best-suited option. This was due to several reasons:

- **Extensive free tier:** Azure Machine Learning offers a free tier for students, and this option was extensive enough for thorough testing and integration.
- **Automation and accessibility:** AutoML's automation, when training and selecting models, gave the team the possibility to create custom models tailored to the problem without requiring extensive work. This time-saving approach was chosen to fit within the time frame dedicated to research models.
- **Flexibility:** Azure Machine Learning offers several different methods for training and deploying a model, giving the team a flexible solution to test different approaches and methods.

After identifying Microsoft Azure Machine Learning as the platform, the team picked their AutoML Categorization Model template as a starting point for building a model. There were detailed guides available, making the process more straightforward.

The development of a machine learning model was an iterative process that trained, tested, and evaluated each model. The different models were all created with a similar approach, but the datasets were altered or recreated for each one.

As described in "Classification Model" (2.7.1), a classification model attempts to predict a label (output) for given features (input). In the case of predicting academic purpose based on a group's name, the single feature of the data is the group name. The label, or output prediction, is the purpose of the group. The datasets were constructed with realistic group names with varying intended purposes. These were either academic or not academic. Examples of group names, with labels, in the dataset were:

Feature	Label
Group Name	Purpose

Figure 3.4: Structure of the dataset

- Java Developers, academic
- Frisbeegolfers, not academic
- Office News, not academic

Figure 3.5: Example of data

The group names were designed to mimic examples provided by Tietoevry. Training and testing data were constructed to accommodate for group names being in both Norwegian and English to suit, but not be limited to, the company's operations in Norway. To create large enough datasets with variation, text-generative AI was utilized. Generative AI is used to swiftly generate and create data based on specific input (Lawton, 2024).

Keywords for Filtration
Given the financial and technical challenges that became evident when building machine learning models, the team also explored a simpler and more direct approach. Keyword-based filtering, which involved creating a list of IT terms and common academic topics that are relevant, appeared to be easier to implement as an alternative solution.

This method scans the group name for these topics that are either regarded as academic or other words that are regarded as not. This method was both reliable and straightforward to implement and use, which reduced complexity drastically.

Keyword-based filtration performs well when the incoming data is predictable and well-known. By understanding the input as well as what's desirable to filter out, the keywords can be built accordingly. (SightEngine, 2024)

The downside of such a direct approach is its lack of flexibility and scalability. Keywords do not catch edge cases where keywords are used but the groups are still not academic. It also does not take into consideration occurrences of non-academic keywords in academic groups, even as partial components. To catch all cases, the keyword list will eventually have to grow quite large, which will increase overhead when fetching and filtering groups.

3.4.3 Research Review

Ultimately, the research gathered from this period was united and reported. The team discussed key discoveries and strategies moving forward. An important part of the review was documenting these discoveries in the main report to create a basis for the rest of the thesis. This review ensured that the team's approach was aligned with the project goals and the needs identified during the research phase.

3.5 Data Application

This section will describe how the collected data was applied and what the process of generating results looked like. This process is illustrated in Figure 3.6.

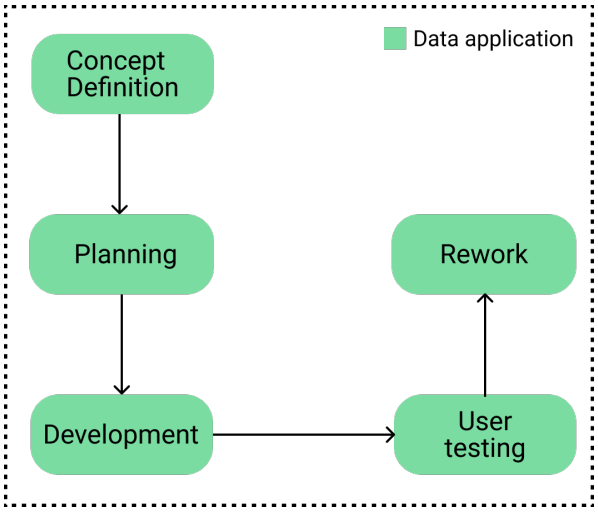


Figure 3.6: Data application

3.5.1 Concept Definition

Following the review of the acquired knowledge from the research period, the collected data was combined to define a possible solution to the problem described in ”Problem Statement” (1.2). The collected data included design principles, opinions of employees at Tietoevry, and observations of other websites. The team also gained a theoretical foundation to support the concept by conducting research into relevant areas like APIs. These insights were integrated by identifying common themes and supplementing them with the most significant individual findings.

As a result of this combination, the team created a foundation for addressing the problem at hand and the defined problem statement. This foundation was then used to define a concept that addressed key parts of the challenges described by Tietoevry.

To serve as a source of validation of the concept, as well as to prove its feasibility, the team decided to design and create a prototype. This prototype should materialize the concept into a measurable product that concretely presents the solution. Moving forward with the prototype led to a planning phase where the team decided how this prototype should be developed.

3.5.2 Planning

The planning phase laid the foundation for development by establishing a structured approach to managing tasks, selecting appropriate technologies, and setting timelines.

The following segments describe the specific strategies used for project management and the technical framework.

3.5.2.1 Time Scheduling

To create a structured plan of the scheduled activities, the team created a Gantt chart to represent these (KIDASA Software, 2024). A Gantt chart is a visual project management tool that outlines tasks over a timeline, showing start and end dates. This helped the team keep track of their progress, stay on schedule, and make any necessary adjustments along the way.

3.5.2.2 Project Management Approach

This segment outlines the project management strategies used for development. It describes the tools and practices that helped the team in keeping the project stay on track.

Kanban Board
The team used a Kanban board hosted on Monday.com to manage the workflow dynamically. This approach included the following steps:

1. **Task Organization:** The main features of the project were logged as issues on the Kanban board.
2. **Task Breakdown:** Each issue was broken down into smaller, manageable tasks.
3. **Workflow Visualization:** The Kanban board provided a visual representation of task progress, allowing team members to see the status of each task in real time.

Issue Tracking with GitHub Issues

1. **Task Assignment:** Tasks were assigned to team members, ensuring clear ownership.
2. **Status Updates:** Real-time updates on task progress were provided through GitHub Issues.
3. **Collaboration:** The platform allowed team members to view each other's tasks, promoting a collaborative environment.

This hybrid approach allowed the team to maintain the structured elements of Kanban while leveraging the versatility and real-time capabilities of GitHub Issues. The combination of these tools ensured a flexible, yet organized project management process, suitable for adapting to the evolving needs of the project.

3.5.2.3 Choice of Technology

A critical factor in the development of the prototype was the need for speed and efficiency. To meet this requirement, the team selected a modern development framework that could offer robust solutions for rapid and effective prototyping. The choice fell on Next.js, complemented by Tailwind CSS.

Next.js, a React framework, offers a range of beneficial features for modern web development (Vercel, 2024a). The framework enabled serverless functions, which allowed the team to implement backend tasks, such as API requests, directly within the same project as the frontend (Vercel, 2024c). Next.js also offers an intuitive and powerful routing system based on the file system, which simplified page creation and management (Vercel, 2024b). These features not only sped up the development process but also improved the manageability of web applications. This made Next.js the preferred choice for the team as it facilitated the rapid development of the prototype.

Additionally, the use of Tailwind CSS accelerated the development process by allowing the team to apply utility classes directly in the markup, taking advantage of predefined classes for common design elements (Tailwind, 2024). It resulted in reduced time spent on styling and ensured a consistent design throughout the application. This combination of Next.js and Tailwind CSS provided the team with a powerful, flexible toolkit to build a high-quality, responsive prototype efficiently.

Vercel was chosen for deployment due to its integration with Next.js and GitHub, allowing each push to the master branch to trigger an automatic deployment (Vercel, 2023). Railway was selected as the database hosting service due to its ability to quickly set up and manage cloud-based data storage (Railway, 2024). This combination of Next.js, Tailwind CSS, Vercel, and Railway provided the team with a powerful, flexible toolkit to build the prototype efficiently.

3.5.3 Development

The development phase was an important stage where the theoretical concept was transformed into a functional prototype. This subsection describes the process of developing this prototype.

3.5.3.1 Designing

Prior to initiating development, the team designed drafts of the prototype using the design tool Figma. The design phase aimed to create a general vision and establish some basic fundamentals regarding the prototype's appearance and functionality.

An important aspect of the prototype design was to create a design that aligned with the principles of good user experience (subsection 2.5.1). The principles of user experience that weighed the most were Jakob's Law, which states that users prefer familiar interfaces, and the Aesthetic-Usability Effect, which indicates that aesthetically pleasing designs are perceived to be easier to use. Creating a prototype with a familiar design and functionality similar to popular existing platforms reduces the learning curve, as users can easily adapt based on their previous experiences.

3.5.3.2 Collaboration and Communication

During the development stage, maintaining a high level of collaboration and communication was essential for efficient workflow. This was important not only within the team but also in maintaining a transparent and productive dialogue with the product owner.

To ensure efficient collaboration, the team utilized GitHub issues and maintained a Kanban board on Monday.com to ensure tasks were clearly organized and priorities were transparent. GitHub issues facilitated the tracking of progress and allowed the creation of separate branches based on these issues. This allowed team members to update task status as development moved forward.

The integration between frontend and backend was managed through the use of shared repositories, ensuring that changes made by one member were immediately available and functional for others. This setup minimized integration issues and allowed for real-time testing of new features and functionalities.

Communication with the product owner was handled through regular update meetings. The objective of these meetings was to review the progress and ensure it aligned with the project's goals. During these meetings, the product owner was presented with the latest version of the prototype, and feedback was gathered to adjust the project direction if necessary. This ongoing interaction ensured that the development remained aligned with the product owner's vision and the project's requirements.

3.5.4 User Testing

This subsection outlines the process of the user testing phase for the prototype, which aimed to evaluate the prototype in terms of usability, functionality, and satisfaction. The feedback from these tests was used to improve the prototype in the rework phase described in subsection 3.5.5, as well as evaluate the team's success in addressing the thesis problem.

3.5.4.1 Objective

The primary objectives of the user testing phase were to assess the prototype's usability, identify any navigational difficulties, evaluate the user interface design, and gather subjective feedback on user satisfaction. Additionally, the testing aimed to measure how useful the prototype would be in solving the problem of scattered information within the organization by receiving feedback from potential users.

3.5.4.2 Participants

To facilitate the recruitment of participants for the testing phase, the task assignor deployed a registration form on the organization's social platforms. This approach allowed employees who were interested and willing to contribute to the evaluation of the new prototype to sign up and participate. The form was distributed through internal communication channels on Teams and Workplace to ensure visibility and

encourage employees from various departments to engage with the testing process. This approach was chosen to gather comprehensive feedback from a representative sample of potential end-users.

3.5.4.3 Testing Methodology

The user testing methodology contained four main stages: introduction to the concept and thesis, introductory questions, task execution, and review questions. The introduction's purpose was to establish a baseline of understanding about the concept and what the test was hoping to achieve. The following questions were aimed to give perspective on the user's familiarity with the current solutions and their use of current platforms. Participants were asked to perform pre-defined tasks on the prototype, such as navigating to a group page or commenting on a post. The tests were conducted using Microsoft Teams and the participants shared their screens so the team could evaluate the interactions with the interface. The review questions were designed to receive constructive feedback on the concept and prototype.

3.5.4.4 Documentation

During the testing sessions, responsibilities were clearly divided among team members to enhance the efficiency and effectiveness of data collection. One team member was designated to guide the process, which involved assigning tasks to the participants and posing questions to probe deeper into their experience during the test. This role was important to maintain the flow of the testing session and ensure that all necessary data points were covered.

Simultaneously, another team member was tasked with the role of observation and documentation. This individual closely monitored how each participant interacted with the prototype, carefully noting behaviors, responses, and any difficulties encountered. This team member also recorded the participants' answers to the questions, ensuring that the data was captured accurately. This systematic approach allowed for an understanding of user interactions and facilitated a thorough analysis of the prototype's usability and functionality.

3.5.5 Rework

After completing the user testing phase, the team entered the rework phase, where the primary objective was to improve the prototype. This phase focused on which changes would improve the prototype based on the feedback from the user testing while ensuring that the changes were feasible and did not require excessive time and resources.

3.5.5.1 Feedback Analysis and Prioritization

The team looked at the feedback collected from participants during the user testing phase. The analysis involved categorizing the feedback into two main types: usability

enhancements and feature requests.

- **Usability Enhancements:** These were changes aimed at making the prototype more intuitive and easier to navigate based on the direct feedback and monitored difficulties encountered by the users.
- **Feature Requests:** These included suggestions for additional functionalities that could improve the overall user experience without significantly changing the core aspects of the prototype.

Each piece of feedback was then prioritized based on the following criteria:

- **Impact:** The effect of the suggested change on improving the prototype.
- **Effort:** The amount of work required to implement the change.
- **Alignment with Project Goals:** How well the changes aligned with the goals and vision of the project.

The team focused on changes that were high-impact yet low-effort to maximize efficiency given the time frame.

4 Results

This chapter describes the results of the project. The results are connected to both the research questions and the problem statement. These serve as the outcomes of the collected and applied data. The results can be divided into two main categories: scientific and administrative. The various results will be clarified in the following sections.

4.1 Scientific Results

The scientific results describe the concrete achievements and results of the process. These include data from the survey and API testing, as well as product and design from the development phase. An overview of the scientific results is shown in Figure 4.1.

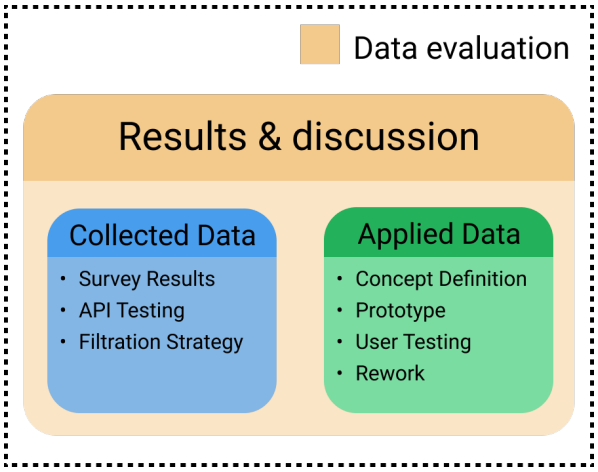


Figure 4.1: Overview of the scientific results

4.1.1 Survey

This subsection presents the results of the survey conducted to evaluate the current tools and platforms for collaboration at Tietoevry. The survey was divided into two parts: The first part aimed to determine the general opinion on the current platforms, while the second part focused on identifying user needs and requirements for social learning. This survey had 35 participants and was analyzed using a quantitative method. The survey was posted in a group on Tietoevry's Workplace consisting of 4299 potential viewers of the post. 2183 people saw the post, and of those, only 35% read the entire post. Despite this, the survey received 35 responses (Source: Insight disclosed to the group by task assignor on Workplace statistics).

4.1.1.1 Part 1: General Opinion on Current Platforms

The first part of the survey sought to gain a better understanding of the current situation regarding tools and platforms for collaboration within Tietoevry.

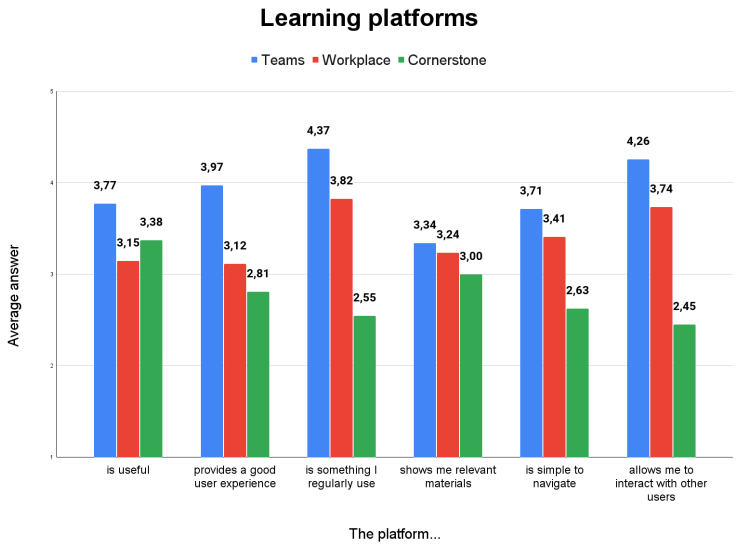


Figure 4.2: Average answers to questions about current platforms

The results of the first part of the survey, as shown in Figure 4.2, display the average responses to statements about the current social learning platforms at Tietoevry. This quantitative analysis indicates a rather neutral opinion on the current platforms. The figure shows that Teams is generally the most liked platform and is perceived as particularly beneficial by employees.

The social aspects, essentially the ability to interact with other users in Teams and Workplace, score relatively high. Teams received an average of 4.26, while Workplace averaged 3.74 on this question. This suggests that there are multiple ways to interact with users on the current platforms. However, it is possible that these interactions, such as Teams meetings and Workplace chats, may not always contribute to social learning.

One aspect that the current platforms seem to lack is the ability to display relevant materials to the user. In this regard, all the platforms received similar scores, with the highest being Teams at 3.34. This low score indicates that sharing and organizing learning materials relevant to the users is a significant issue.

4.1.1.2 Part 2: User Needs and Requirements

The second part of the survey focused on identifying user needs and requirements. This part aimed to uncover core issues with current platforms regarding social learning

and to determine the most important improvements.

The first question, being: ”What, if any, are your biggest issues with the current platforms?” allowed the participants to choose one or more alternatives, as well as to add their own comments. In this question, two core issues were discovered: 18 out of 35 participants chose the option of ”Difficult to find materials”, and 16 chose ”Shows me too much information”. This relates back to the first part of the survey where the participants indicated a lack of relevant information. The current platforms do not facilitate effective information sharing and collaboration. By not being able to find the content the user is looking for, the current solutions are limiting the potential of social learning.

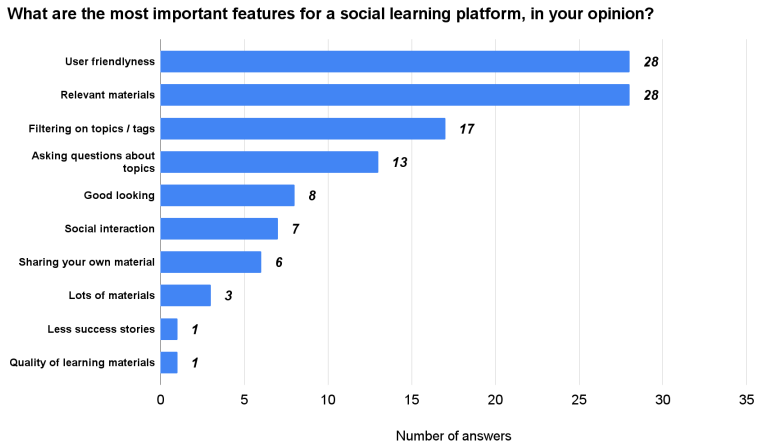


Figure 4.3: Second question: The most important features for a social learning platform, according to Tietoevry employees

The second question: ”What are the most important features for a social learning platform, in your opinion?” aimed to help the team decide what parts of a new concept should be prioritized. As shown in Figure 4.3, 28 out of 35 participants thought that user-friendliness and displaying relevant materials were the most important features of a social learning platform. Another feature that about 50% of the participants thought was important was the ability to filter content by topics/tags. The team linked this directly to the general issue of information overload and lack of relevant materials in user feeds in current solutions.

The last question: ”If a new platform were to be developed, would you be open to try this out?” wished to determine the interest and willingness to try out a new social learning platform that addresses the issues identified in this survey. Figure 4.4 shows the results for the question. From this, there are two key details to notice. Firstly, the sum of answers with a clear yes was 68.5%, showing great interest in a potential product. Secondly, no participants answered that they were not open to a new platform due to their preference for the current platforms. This result showed the team the relevance of the thesis and the need for new solutions in terms of social learning. The complete results can be found in Appendix B.

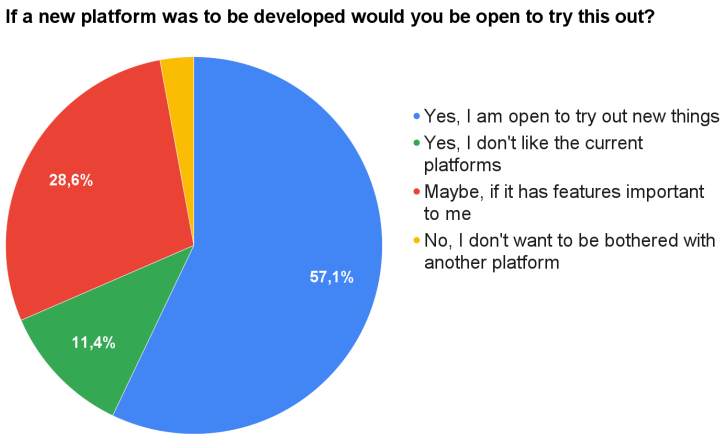


Figure 4.4: The percentage of answers per question choice

4.1.2 API Exploration

One of the deciding factors to determine the feasibility of the concept was to learn more about the available APIs. The team conducted experiments and testing to discover if they were accessible, how they worked, and what data was possible to extract. The results of this testing can be divided into three categories, which will be discussed in this subsection.

4.1.2.1 Accessibility

The first step was to ascertain that the functionality proposed in the concept was achievable. The team had to confirm that both Workplace and Teams provided APIs from which the information displayed on their interfaces could be obtained. This involved gaining access by creating users, retrieving keys to use the APIs, and testing them to see if the data was extractable using these. The team successfully identified that both APIs offered the necessary access to users, group data, and messages, assuring that the integration of these services would be achievable.

4.1.2.2 Data Extraction

The next step was to evaluate the functionality of the APIs. The team focused on understanding the range of operations that could be performed using these APIs. This included retrieving data such as groups, posts, and materials from the two platforms and understanding their separate structure.

```
{
  "id": "1713434376685",
  "messageType": "message",
  "createdDateTime": "2024-04-18T09:59:36.685Z",
  "lastModifiedDateTime": "2024-04-18T10:00:10.178Z",
  "lastEditedDateTime": "2024-04-18T10:00:10.061Z",
  "from": {
    "user": {
      "id"          : "abd47d56-d069-4f35-bc3d-e52e356509df",
      "displayName": "Aleksander Olsvik"
    }
  },
  "body": {
    "contentType": "text",
    "content": "Kotlin er bra! Sjekk denne powerpointen<attachment
      id=\"a92c8ae2-811e-4a9e-a8f7-dd22028e05d2\"></attachment>"
  },
  "channelIdentity": {
    "teamId"    : "f39a2812-c81d-4b79-834b-383853c1a99a"            ,
    "channelId": "19:c5160ba23d5e4a7ca7923b6c9523d36e@thread.tacv2"
  },
  "attachments": [
    {
      "id": "a92c8ae2-811e-4a9e-a8f7-dd22028e05d2",
      "contentType": "reference",
      "contentUrl":
        "https://studntnu.sharepoint.com/sites/o365_Faggrupper/Shared
        Documents/Backend - Java og Kotlin/Introduction_to_Kotlin.pptx",
      "content": null,
      "name": "Introduction_to_Kotlin.pptx"
    }
  ],
  "mentions": [],
  "reactions": []
}
```


Figure 4.5: Example of Teams message structure


```
"id": "1136963744305829_1136964217639115",

"created_time": "2024-05-15T12:12:07+0000",
"updated_time": "2024-05-15T12:12:09+0000",

"from":
{
    "name": "Aleksander Olsvik",
    "id": "61558040442641"
},

"formatting": "PLAINTEXT",
"message": "# Kotlin er bra!\n\nSjekk ut denne powerpointen",

"story": "Aleksander Olsvik uploaded a file in the group: Java - Kotlin
  Backend.",
"to":
{
  "data":
    [
      {"id": "1136963744305829", "name": "Java - Kotlin Backend"}
    ]
},

"type": "status",


"attachments": ["fetched separately"],
"reactions": ["fetched separately"]
```


Figure 4.6: Example of Workplace post structure

Figures 4.5 and 4.6 illustrate examples of the data the APIs returned when retrieving posts, with each entry representing a single post or message. The data structure is quite similar between the two, and they both provide essential information that can be used to recreate them on the prototype.

They both included data such as ID, message, formatting, sender, and group ID. The Teams API allowed for the retrieval of attachments and comments along with the posts, while the Workplace API required these to be fetched separately. The information that is accessible from this data can be organized and unified into a single homogeneous datatype. This allowed the data to be reused and combined with data originating from the prototype, creating a unique combination of data from various sources.

4.1.2.3 Organization

Additionally, the team examined the types and formats of data that could be extracted using the APIs. This involved determining the structure of the data returned by API calls and assessing whether this data could be seamlessly integrated into the proposed system. The analysis showed that the data was well-structured and consistent, enabling easy parsing and manipulation.

```
{
  "id": "id of the individual post",
  "group_id": "id of the group the post wasposted in",
  "created_at": "timestamp of creation",
  "from": "the one who posted",
  "to": "the tags/mentions of a post",
  "formatting": "formatting, like PLAINTEXT, HTML & MARKDOWN",
  "title": "title of the post",
  "message": "message/body of the post",
  "attachments": ["list of attachments, like pdfs and images"],
  "type": "type of post, like a message, image or video",
  "comments": ["the comment objects of a post"],
  "likes": "amount of likes"
}
```

Figure 4.7: Structure of a post, regardless of origin

The structure of a single post is depicted in Figure 4.7. Here, the main fields related to a post are combined to create a data structure that contains all the relevant information to display a single post.

The API exploration confirmed that both Workplace and Teams provided the necessary accessibility, functionality, and data extraction capabilities to support the proposed concept. The findings from this testing phase laid a solid foundation for further development and integration efforts.

4.1.3 Filtration Strategy

The survey identified noise in user feeds as a core issue. Many of the posts displayed do not contribute to social learning, and therefore the current platforms are falling short in this regard. Addressing this issue is central to proposing a solution.

To address this, the team implemented filtration strategies to determine which incoming groups should be processed further. This solution reduces the overhead of processing irrelevant groups and minimizes clutter on the new prototype.

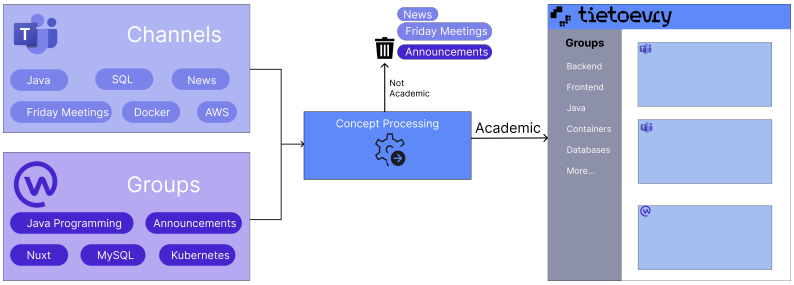


Figure 4.8: Filtration strategy from API to new platform

Figure 4.8 illustrates how the filtration strategy was applied as an intermediary step between data fetching and display in the prototype. Groups and channels from external platforms (Workplace and Teams) are filtered out if their purpose is non-academic. Groups with social learning and academic purposes are processed further, which involves retrieving additional data such as posts and comments.

As presented in segment (3.4.2.4), two main strategies were explored for this purpose. The results of these explorations are presented in the following segments.

4.1.3.1 Machine Learning

The first filtration strategy explored was using a machine learning model. The team used Azure AutoML to iteratively train and improve a classification model. The datasets, generated using Generative AI, were adjusted between each training to address weaknesses. Given that predicting a label from a single feature is theoretically simple, the dataset sizes were smaller than average.

Iteration 1: The first iteration was trained on approximately 250 entries, divided 80/20 into training and testing data. It achieved 92% accuracy on the test data. Manual testing revealed that while the model performed well on individual keywords, it struggled with combined words, leading to misclassifications such as classifying ”Announcements” as ”Academic” and ”Backend Developers” as ”Not Academic”.

Feature	Label
Backend	Academic
Java - Kotlin	Academic
News	Not Academic
Announcements	Academic
Backend Developers	Not Academic

Table 4.1: Iteration 1: Categorization of test data

Iteration 2: The second iteration expanded the dataset to about three times the size, focusing on IT-specific names and more realistic group names. It aimed to resolve issues from Model 1, particularly those involving combined words. This model achieved 98% accuracy and was generally more accurate, but it still misclassified some technological terms, such as "Java - Kotlin" as "Not Academic".

Feature	Label
Backend	Academic
Java - Kotlin	Not Academic
News	Not Academic
Announcements	Not Academic
Backend Developers	Academic

Table 4.2: Iteration 2: Categorization of test data

Iteration 3: The third iteration focused on academic IT groups and technological terms, with the same amount of training data but slightly more test data. It included many technological terms and keywords, gradually increasing complexity. This model achieved 88% accuracy. While it was effective at classifying technological terms, it tended to over-classify single-word group names as academic, reducing its overall filtering efficiency.

Feature	Label
Backend	Academic
Java - Kotlin	Academic
News	Academic
Announcements	Academic
Backend Developers	Academic

Table 4.3: Iteration 3: Categorization of test data

4.1.3.2 Keyword Filtration

The second strategy that was explored was keyword-based filtration. This process involved utilizing keywords to verify whether the group names contained specific keywords or not. Employing such a strategy was simple in practice, and could easily be manipulated to correct errors.

The group tested with different types of keyword lists. The two most prominent ones were one with keywords that the group names *should* contain, and one with keywords that the group name *should not* contain. These two approaches yielded similar results, but the latter produced fewer misclassifications. Examples of words that were used for filtration include ”news”, ”office” and ”people”.

4.1.4 Concept

After reviewing survey results, looking into external research, as well as the possibilities for creating an interface between the existing platforms, the team defined a concept to be suggested as a solution. This concept involved key takeaways from the survey as well as the research done, especially regarding design principles. This subsection presents the concept that the team presented to Tietoevry as a solution.

4.1.4.1 Concept Overview

Today's solutions are not able to provide employees with a centralized, accessible, and relevant way of sharing information. The concept, named Societo, aims to solve this problem by offering an all-in-one application that allows employees to effectively find and share learning resources. The concept will serve as an interface that aggregates posts from existing platforms, displaying and organizing them in a way that makes it easier for users to find what they are looking for.

The concept of Societo was designed to address the primary problem statement: ”How can an organization facilitate social learning by ensuring that information sharing is centralized, accessible, yet relevant and supportive of collaboration?” To help answer the problem, research questions were created.

4.1.4.2 Purpose of Research Questions

Research Question 1
Which features/attributes do employees consider important for a social learning platform, and how do these features align with the shortcomings of existing platforms used in the organization?

This question aimed to identify the key features employees value in a social learning platform and address the gaps in existing systems. By understanding user needs, the concept could be tailored to improve user experience and meet specific requirements.

Research Question 2
How can the information available on platforms like Workplace and Teams be analyzed, organized, and generalized to support cohesive integration into a new social learning platform?

This question focused on the technical aspects of integrating information from existing platforms. It aimed to develop strategies for analyzing, organizing, and unifying data,

ensuring the new prototype offers a seamless and cohesive user experience.

4.1.4.3 What the Concept Aims to Fix

The primary issues identified with the current platforms include:

- **Fragmentation of Information:** Information is currently scattered across multiple platforms, making it difficult for employees to find relevant learning materials.
- **Lack of Accessibility:** Existing platforms do not provide a user-friendly way to access and navigate the needed information.
- **Irrelevant Content:** Users are often flooded with irrelevant information, not only prohibiting involvement but making it hard for the users to find what they are looking for.

4.1.4.4 How the Concept Addresses These Issues

The Societo concept addresses these challenges by:

- **User-Friendliness:** The concept should have an intuitive and consistent interface. This includes clear navigation elements that facilitate easy movement through the concept. Additionally, the concept should minimize the learning curve for new users by feeling familiar compared to what they have used in the past and ensuring that common tasks are easy to perform.
- **Relevant Material Display:** The concept should prioritize dynamic organization and presentation of content. This means displaying the most relevant and recent information directly on the homepage and group pages, ensuring that users can quickly access what is most important to them. Customizable dashboards or feeds that adapt to user preferences can enhance this aspect.
- **Content Filtration:** Advanced search and filtration options are essential. The concept should allow users to sort and find materials based on various criteria, such as tags, topics, or date. This helps locate relevant content and reduces the time spent looking through unnecessary information.
- **Interactive Features:** The concept should support robust interaction capabilities. This includes the ability to create and tag posts, comment on content, and engage in discussions. Interactive elements like forums, Q&A sections, and collaboration tools are important to create a sense of community and active participation among users.
- **Engagement Incentives:** To make users want to use the concept, incorporating gamification and incentives will be important. Features, such as badges, leaderboards, and rewards can be implemented to encourage active participation and content creation. These elements can motivate users to engage more frequently and contribute positively to the concept.

- **API Integration:** The concept should utilize APIs from Workplace and Teams to fetch and display relevant data. This integration ensures that users have access to necessary information from multiple sources in one place, enhancing accessibility.
- **Unified Interface:** The concept should present data from various sources through a consistent and clear interface. This should reduce information scattering, enhancing usability by allowing users to find content and materials with less effort.
- **Data Organization:** A system for categorizing and tagging content is essential. The concept should provide tools for organizing data in a way that makes it easy to find and interact with. This might include automated tagging based on content analysis, user-generated tags, or categorization by topics and themes.

4.1.4.5 Realizing the Concept

To realize the Societo concept, the team aimed to develop a prototype that incorporates these features. This involved leveraging advanced UI/UX design principles, integrating APIs from existing platforms, and implementing elements to encourage engagement. By doing so, the Societo prototype will provide a centralized, accessible, and collaborative environment that enhances social learning and information sharing within Tietoevry.

The conceptual solution, Societo, thus offers a structured framework to facilitate social learning at Tietoevry by addressing the core issues identified through the research questions.

4.1.5 Prototype

This subsection presents the prototype, Societo, which was developed using API integration and research into UI/UX to create a platform that can facilitate social learning at Tietoevry.

4.1.5.1 API Integration

As indicated previously, using and integrating the APIs into the prototype was a crucial step of realizing the concept. This was done in three main steps which will be explained in detail in the following segments.

Incoming Data from APIs
To begin with, the data had to be retrieved from the APIs on the server of the application. Since the structure of the data available from Workplace and Teams differed in structure, this was done in two separate parts and then joined together.

The first step was to obtain the names and IDs of relevant groups and channels from the two platforms. To obtain channels from the Teams API, the different teams in the organization had to be retrieved first. After this step, filtration strategies were applied to only fetch channels from the relevant teams, as a specific team might not

be of general interest. The channels from these teams were then fetched and filtered using the same technique.

For Workplace, the fetching was more straightforward. The groups were gathered directly and went through the same filtration process. This resulted in a list of group names with their corresponding IDs. These were saved for later use.

The next step was to fetch posts from the different groups and channels. This was done in the background on demand when these were requested from the client. Fetching the posts alone was straightforward, using the IDs of the groups. To obtain the post with comments, reactions and attachments, the Teams API required some changes to the query that requested them. The Workplace API required separate requests to retrieve these. Combining the information resulted in complete groups and channels with posts, including their materials, reactions, and comment fields.

Organization
To effectively create a uniform data structure, the groups and posts were stored in a fixed manner. As mentioned earlier, the formatting of the posts varied. To ensure a consistent display, the body was transformed into plaintext. This involved extracting the title (if possible), tags, attachments, and URLs.

The post was stored with information such as ID, title, body, and who posted it (ID). Additionally, comments, materials, attachments, users, and tags from a post were stored separately.

The main reason for storing groups, posts, and comments instead of fetching them on demand each time was the desire to create an interface for these platforms, allowing users to interact and contribute directly on Societo. This involved, among other things, creating posts, liking posts, joining groups, and leaving comments.

Outgoing Data from Server to Client
When displaying the data fetched through the APIs on the interface, the client sends requests for this data to the server. The server would then return the stored data, as well as attempt to update the data if a certain amount of time had passed since the last update.

The functionality of the client will be described further in this chapter and will not be detailed in this segment. However, one of the features of the concept is to merge content from different groups and channels on Workplace and Teams together. This was done by allowing an intended administrator to create a ”Societo group”, which was an overall group for a given topic. This group consists of one or more groups or channels from Workplace and Teams and serves as an interface for seamlessly displaying these together.

To facilitate this functionality, the server stores the *Societo group* and their corresponding groups from Teams and Workplace. As described in the introduction, the server will then return the posts from the related groups of a given Societo groups to the client on demand.

In summary, the APIs are integrated to fetch and update data on demand. In total, the APIs create the foundation for the content on the platforms, whereas the flexible integration of them allows for original content, such as posts and materials, to be created directly on the Societo platform.

4.1.5.2 Wireframes Design

As mentioned in Methodology (subsection 3.5.3), the development phase began with creating wireframes based on the UI/UX research. The wireframes helped shape the Societo prototype by providing a clear idea of how the interface should look and work. The wireframes gave the team a solid starting point and guided the design process.

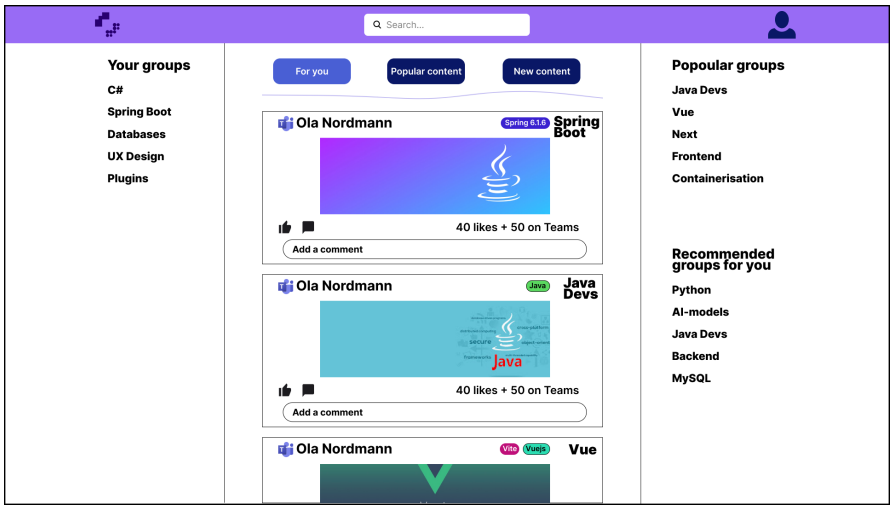


Figure 4.9: Wireframe for the Homepage of the website

4.1.5.3 Functionality and Design

This segment presents the different pages and main features of the Societo prototype. It describes the layout and functionality of each part of the application with accompanying images to further illustrate this.

The presented pages are:

- *Root Layout*
- *Home*
- *All Groups*
- *Group Page, Post Section*
- *Group Page, Material Section*
- *Post Page*

Additional features presented are:

- *Search Functionality*
- *Dark Mode*

Root Layout

The interface of the prototype is designed to ensure consistency and ease of navigation across all its pages. The prototype uses a global sidebar and navigation bar (navbar) to achieve this.

The sidebar is a navigational component that appears consistently throughout the prototype. It includes several key elements:

- **Home button:**
  Directs users back to the main dashboard.
- **All Groups:**
  Allows users to view and access a list of all Societo groups.
- **Recent:**
  Displays the most recently viewed Societo groups.
- **Your Groups:**
  Displays the Societo groups the user is a member of.

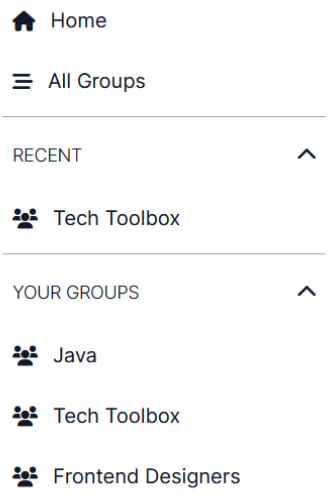


Figure 4.10: Sidebar

Home Page

The Home page of Societo serves as the primary dashboard for users, offering a dynamic feed of content from various groups where the user is a member. The layout allows users to see the latest discussions, updates, and resources from their groups all in one place.

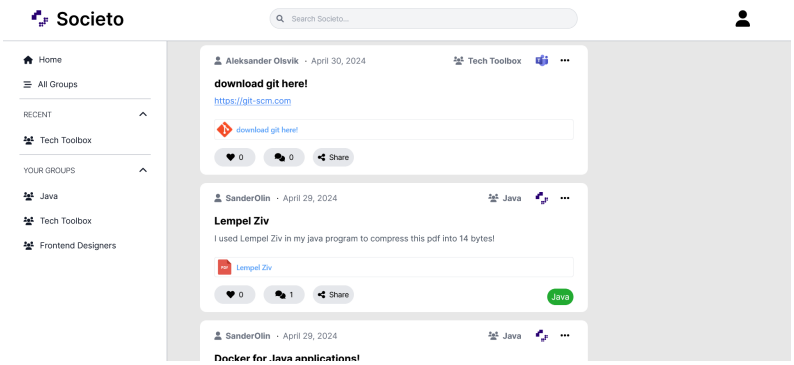


Figure 4.11: Home page

All Groups Page

The All Groups page displays all Societo groups that have been created on the prototype. Each group listed here has been created within the Societo prototype and maintains links to corresponding groups on Teams and Workplace, as described in "API Integration" (segment 4.1.5.1).

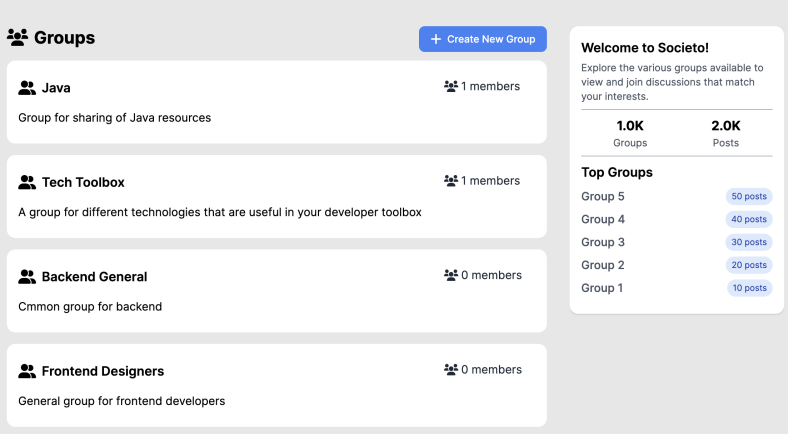


Figure 4.12: All groups

Group Page, Post Section

The Group page provides detailed information about each Societo group. It shows which external groups from Teams and/or Workplace are linked to it, and provides statistics on the total number of members, posts, and materials associated with the group. The page is split into two sections, "Posts" and "Materials", with the first being the default. The posts displayed in the Posts section, as well as on the Home Page, originate either from these external platforms, as described in "API Integration" (segment 4.1.5.1), or have been created within the Societo group.

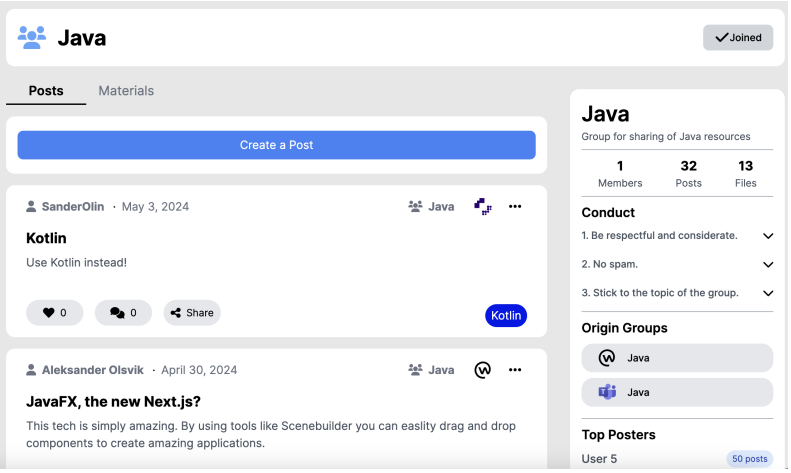
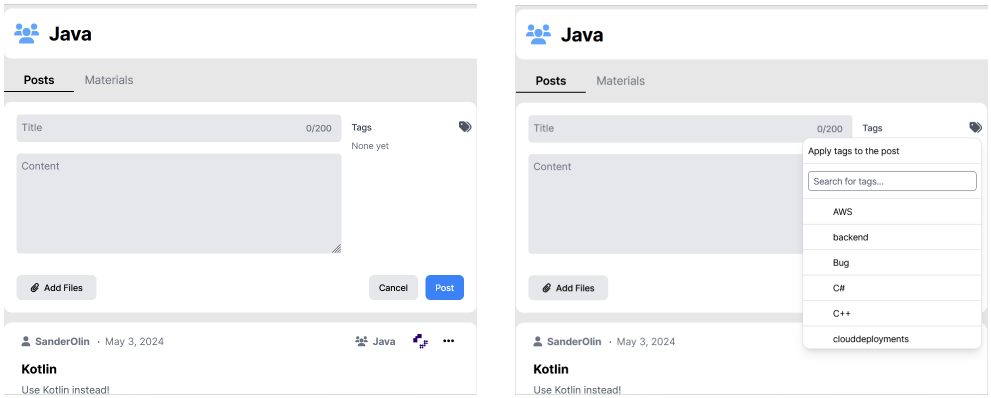


Figure 4.13: Group page, section for posts

In addition to viewing information and materials, users can also create new posts within these groups. Any posts created will be stored in the Societo Group and visible to other Societo users. When creating a post, users can specify the title and content, as well as attach relevant materials. They can also attach tags to the post by clicking on the tag box, which expands to show available tag options, helping categorize the post for better searchability and relevance.



(a) Creating a post on the Group Page (b) Tagging functionality in post creation

Figure 4.14: Post creation and tagging functionality

Group Page, Material Section

The Materials section organizes files/materials such as PDFs, links, Excel sheets, and more, which are associated with posts. If a post contains any material, it will automatically be displayed in this section, making it easy for members to find and access group resources.

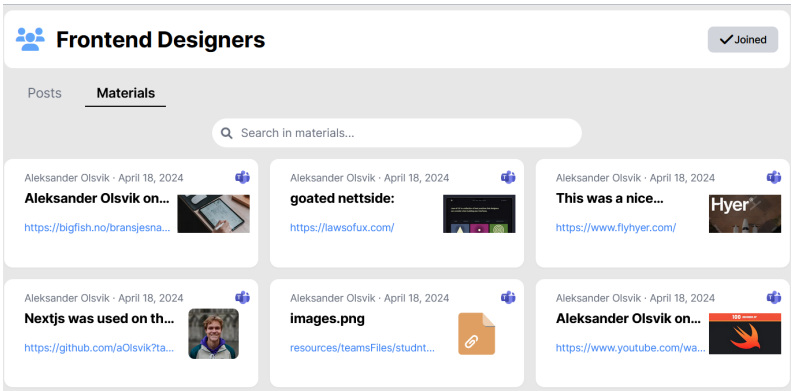


Figure 4.15: Group page, section for materials

Post Page

The Post page displays a single post in detail, along with comments attached to the post. This page allows users to engage with the content. Here, the user is able to read, respond, and share thoughts on the post. If the post includes any materials like links or attached files, these are also displayed here. The page also displays information about the Societo group the post belongs to. This is the same ”Group Sidebar” as shown on the Group page, post section (Figure 4.13).

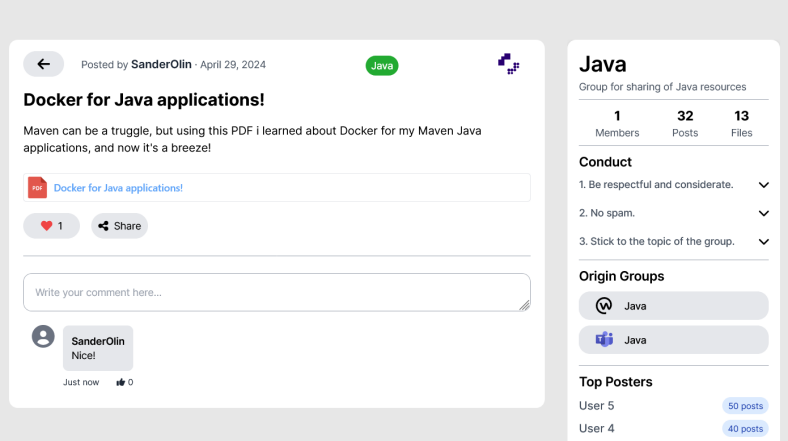


Figure 4.16: Post page

Search Functionality

The search functionality in Societo is accessible via a global search bar, as mentioned previously, at the top of every page. The search feature is designed to help users find groups directly from the search results. If a user types a query into the search bar and does not select a direct group result but rather enters a search term, they are redirected to a dedicated Search results page.

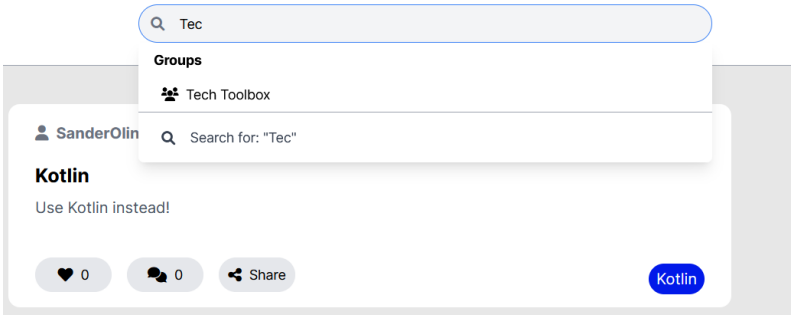


Figure 4.17: Example of the search functionality in action

The Search results page is organized into two sections: ”Posts” and ”Groups”. By default, the Search page opens on the ”Posts” section. This section displays all relevant posts, including those with search parameters in the title, content, or name of the group in which the post was made.

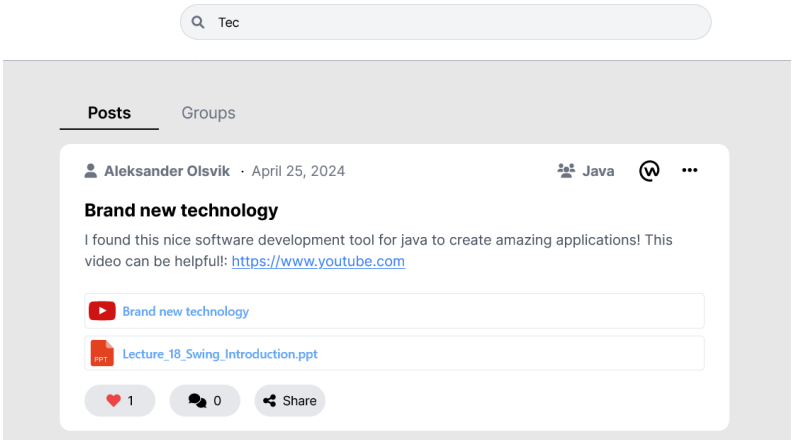


Figure 4.18: Search results in the 'Posts' tab

The ”Groups” section showcases groups where the search term matches the group's name.

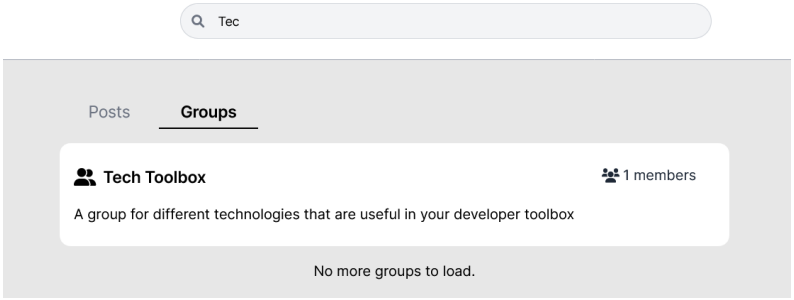


Figure 4.19: Search results in the 'Groups' tab

When navigating within a specific group's page, the search bar recognizes this, enabling users to search for posts within that group. As users type, suggested results based on the search input are displayed in a dropdown menu, providing a quick way to find relevant posts directly.

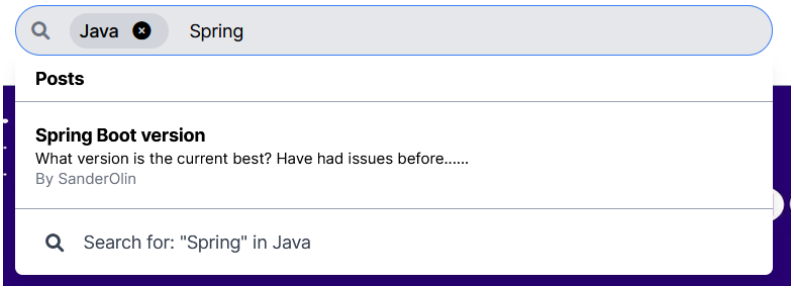


Figure 4.20: Dropdown with search suggestions within a group

If users enter a term and choose not to click on a suggested result from the dropdown, they are redirected to the Search results page. The page is automatically filtered to only show posts from the group they were originally viewing. Users have the option to remove this group-specific filter at any time, expanding their search across the entire prototype if desired.

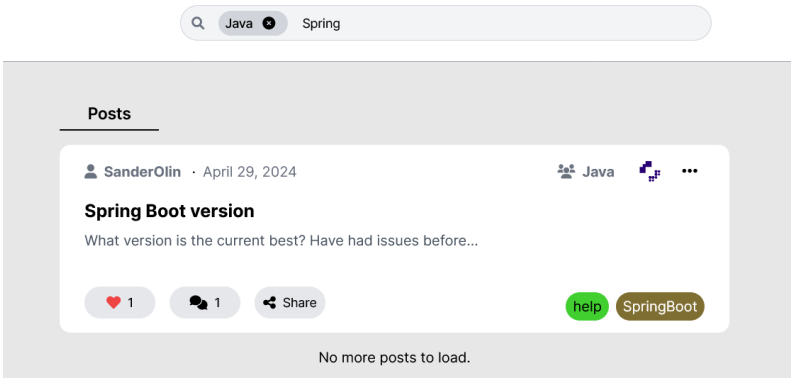


Figure 4.21: Search results with group filter

4.1.5.4 Dark Mode

The Societo prototype also includes dark mode, catering to user preferences for a darker color scheme that is easier on the eyes.

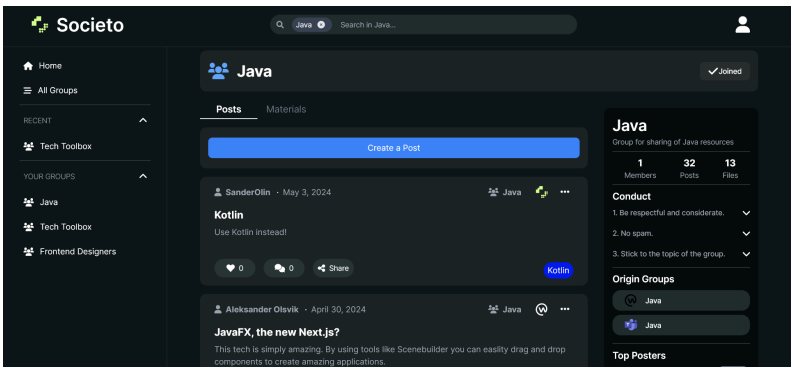


Figure 4.22: Group page in dark mode

4.1.6 Prototype User Testing

This subsection presents the results of the user testing. The testing, as described in subsection 3.5.4, aimed to evaluate the usability, functionality, and user satisfaction of the prototype. Data was gathered through a combination of task-based assessments and questions.

4.1.6.1 Participants

Four subjects agreed to participate in the testing phase via a recruitment form. These subjects remain anonymous but come from different parts of Tietoevry, representing the typical end users of the product. This diversity ensured that the feedback collected reflected a range of user experiences and needs within the organization.

4.1.6.2 Key Findings

While feedback varied among the test subjects, several key aspects were consistently noted by all participants:

- Each interviewee recognized the value of the prototype and acknowledged the need for a more structured approach compared to current solutions.
- All users were able to navigate the prototype easily, highlighting the similarity to already known platforms and interfaces.
- Furthermore, every participant expressed a willingness to use the prototype as a tool to enhance social learning and information sharing within the organization.

4.1.6.3 Usability

Usability is a critical aspect of any social platform. The feedback from the participants indicated that they were generally satisfied with the interface and could navigate the prototype effortlessly.

However, the participants did provide constructive feedback on additional features that could further enhance the user experience and improve how information is displayed on the interface. For instance, one suggested improvement was to colorize the tags to make them more prominent in posts.

4.1.6.4 Functionality

The participants found the core functionality, such as the filtration and organization of data, to be valuable. The team received feedback on additional functionality the participants thought would add value to the prototype. Some notable suggestions included: adding a feature to see all posts that contain a certain tag and continuing to work on functionality that incentivizes users to contribute, such as the ”top posters” feature. This is an aspect the team saw great value in, and is definitely something that would be heavily weighted in future work.

4.1.6.5 Participant Engagement and Satisfaction

The participants demonstrated a high level of engagement throughout the testing process. This was shown not only through their body language and intonation but also in their feedback. The participants seemed to show a genuine interest in the product and concept. The test results can be found in Appendix C.

4.1.7 Rework

In response to the insightful feedback gathered during the user testing phase, the team worked on improving the prototype by implementing some of the suggested changes. Figure 4.23 provides a summary of the feedback received during user testing. Each feedback point is assessed based on its impact, effort, alignment with project goals, total score, and whether it was implemented. The total score is derived from the values of the three previous columns. High impact and alignment gives a high score, while high effort gives a low score.

Feedback Type	Feedback Point	Impact	Effort	Alignment	Total Score	Implemented
Usability Enhancement	Material Origin Platform	Medium	Low	High	8	Yes
Usability Enhancement	Enhanced Tag Visibility	Medium	Low	High	8	Yes
Feature Request	Make File Clickable in Feed	High	Low	Medium	8	Yes
Feature Request	Keep Search Parameters in Search Bar	Medium	Low	Medium	7	Yes
Feature Request	Adding Further Gamification	High	High	High	7	No
Feature Request	All Posts with Certain Tag	Medium	Medium	Medium	6	No
Usability Enhancement	Specify Group Origin in Create New Group	Low	Low	Medium	6	No
Feature Request	Automatic Refresh on Group Join	Medium	Medium	Medium	6	No
Feature Request	Create Different Post Types	Medium	High	Medium	5	No
Feature Request	See All Members in a Group	Low	Medium	Medium	5	No

Figure 4.23: Suggested points of improvement

4.1.7.1 Tags

Original Issue:
Users found the original tags to be indistinct and difficult to spot on a post at first glance.

Change Made:
Firstly, the team moved the tags to be more separate from other information shown at the top of the post to make the tags stand out more. Secondly, the team color-coded the tags based on their hash value to ensure the same tag would always have the same color and stand out from each other.

Expected Impact:
This change is expected to speed up the recognition of different tags, making it more clear what the post is about.

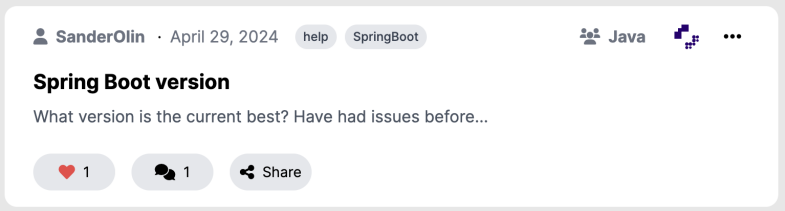


Figure 4.24: Old Tag Design

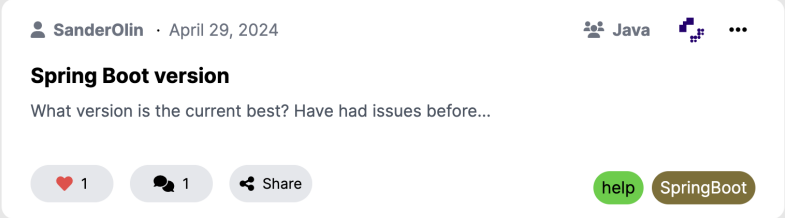


Figure 4.25: New Tag Design

4.1.7.2 Post File Handling

Original Issue:
User were not able open attachments from a post without having to click the post itself to be navigated to the respective post page. This led to unnecessary routing for the user, and it was not really clear what files or attachments a post contained.

Change Made:
Attachments on posts were made clickable elements, each accompanied by an icon indicating the type of attachment. These attachments were encased within a border to distinctly separate them from the post's text content, enhancing the structure of the post.

Expected Impact:
The addition of clickable attachments in the feed is expected to make it easier for users to see the attachments in a given post and improve the user experience by reducing unnecessary navigation.

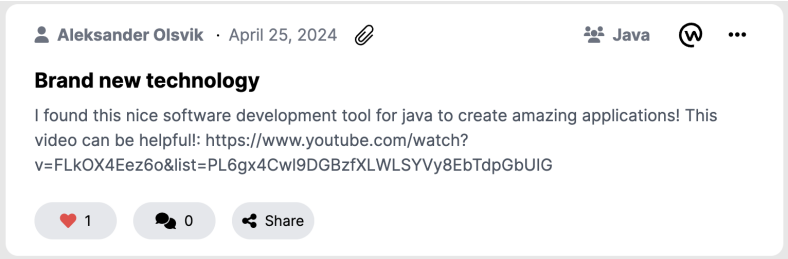


Figure 4.26: Old Post File Handling

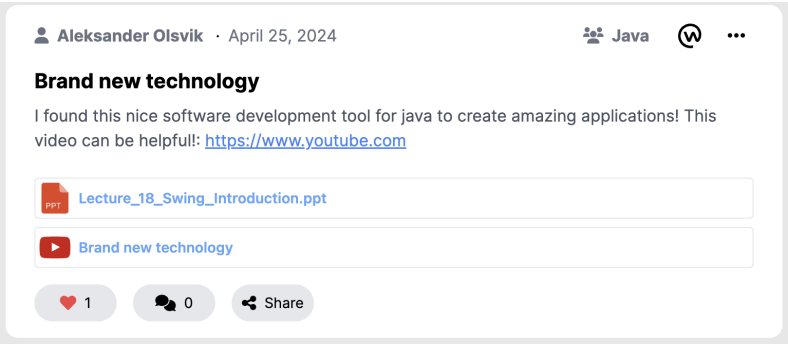


Figure 4.27: New Post File Handling

4.1.7.3 Materials

Original Issue:
It was unclear which platform materials originated from, as this was not displayed.

Change Made:
An icon was added to the material card to display where the material was originally posted. This icon was the logo of the respective platform. Additionally, the displayed icons and images were changed to reflect the type of the material.

Expected Impact:
This change aims to make it clearer to the user where the material was originally posted, as well as what kind of material it is.

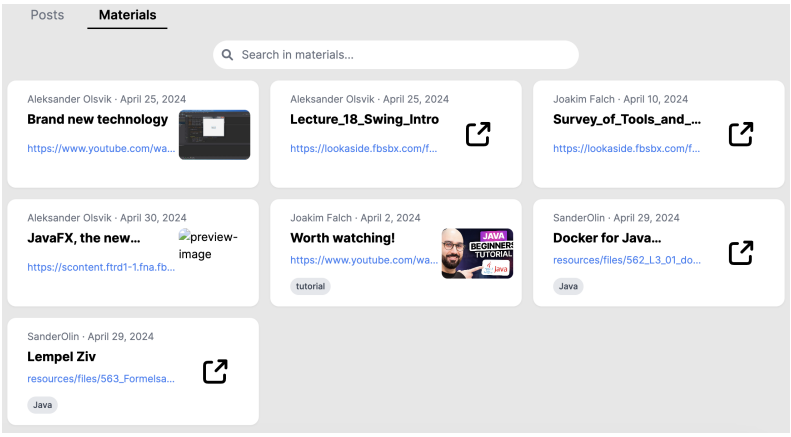


Figure 4.28: Old Materials Page

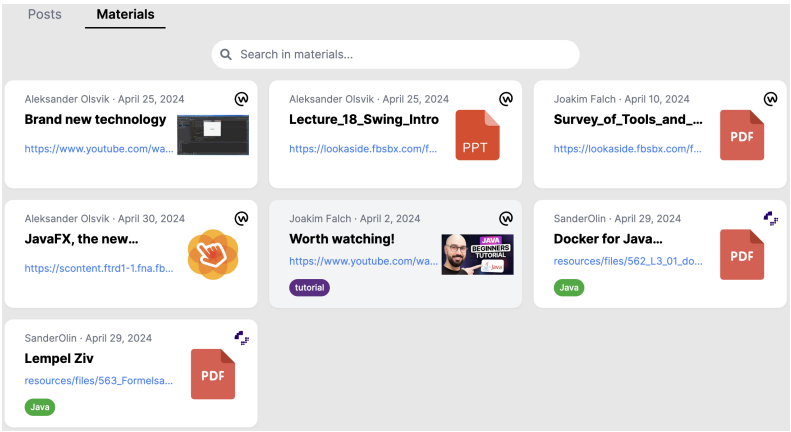


Figure 4.29: New Materials Page

4.1.7.4 Search Parameters

Original Issue:
Originally, the issue of searching on the prototype was that there was no information displayed about where the search happened. It was unclear whether the search searched the entire prototype, or within the group the user was currently navigated to.

Change Made:
To address the issue, parameters were added to the search bar to illustrate where the search would take effect. If the user was in the group ”Java” it would state ”Java” as a tag in the search bar to improve clarity.

Expected Impact:
This change is expected to reduce confusion when searching within the prototype, thereby improving the user experience.

Figure 4.30: Old Search

Figure 4.31: New Search

4.2 Administrative Results

This section will present the administrative results of the project, focusing on the strategies and tools used to manage time and project structure.

4.2.1 Project Plan

To tackle the aspect of time management and project structure, a Gantt chart was implemented as a strategic tool to visually map out the timeline of the project from start to completion. Its primary role was to provide a structured outline of all project phases and milestones, ensuring a coherent and systematic approach to managing tasks.

The chart was divided into four main stages: Starting Phase, Planning and Research, Development, and Evaluation and Final Delivery. These main stages were again divided into more detailed points. The complete Gantt chart can be found in Appendix D.

4.2.2 Project Management

Initially, the team intended to adopt the scrum development methodology for the project. As the project progressed, a more flexible approach was necessary, leading to the adoption of a hybrid project management strategy. This approach combined the structured elements of Kanban with the versatility of issue tracking via GitHub Issues.

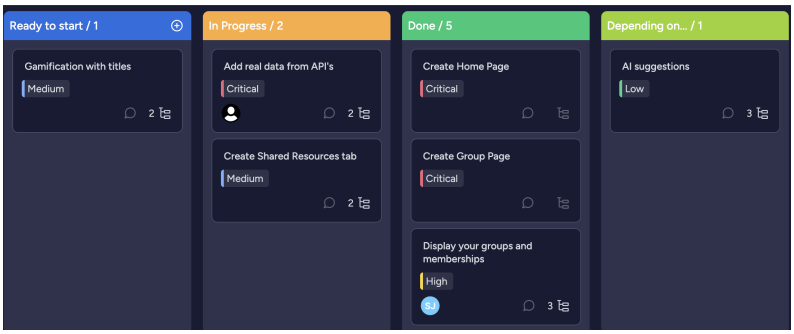


Figure 4.32: Kanban Board in Use During Week 16

The team utilized a Kanban board hosted on Monday.com to manage workflow dynamically. Each main feature of the project was initially logged as an issue on the Kanban board. These issues were then broken down into smaller, more manageable tasks, allowing for easier tracking and more efficient progress monitoring.

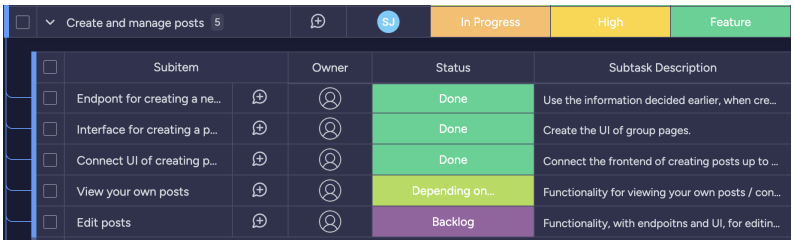


Figure 4.33: Detailed View of an Issue on the Monday Kanban Board

Furthermore, GitHub Issues provided an effective platform for task assignment and status updates. Team members could easily assign tasks to themselves, increasing visibility across the project. The integration of GitHub's issue tracking also facilitated real-time updates on task progress and allowed team members to see what others were working on, helping to create a collaborative and transparent work environment. An example of issues can be seen in 4.34.

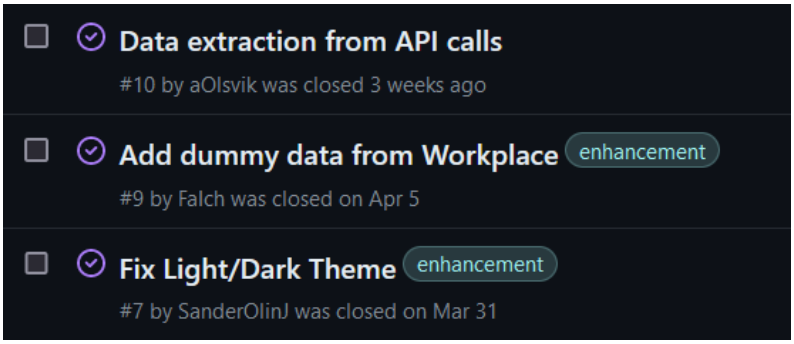


Figure 4.34: GitHub Issues

5 Discussion

This chapter discusses the results presented in the previous chapter. Like the "Results" chapter, it is divided into two parts: scientific and administrative results. At the end of this chapter, the results will be analyzed to address the research questions defined at the beginning of the thesis.

5.1 Scientific Results

This section will discuss the scientific results of the project. The results include empirical data from the survey, findings from API testing, outcomes from user testing, and an evaluation of the proposed concept and prototype as a solution.

5.1.1 Survey Analysis

The survey aimed to gather insights into the current tools and platforms for collaboration at Tietoevry. The survey provided valuable data on important features for future development, the responses also highlighted challenges with the current platforms.

5.1.1.1 Analysis Method

To analyse the survey, both quantitative and qualitative methods were used. The quantitative method focused on collecting data which could be easily compared. The qualitative method were used to gain a deeper understanding of the numerical data collected.

Quantitative Method
The survey was primarily analyzed using a quantitative approach, which involved collecting numerical data to provide an overview of employee opinions on the current social learning platforms at Tietoevry. This method was chosen to capture a general and unbiased perspective from a large sample of participants, ensuring that the results were more representative of the organization than using a solely qualitative approach.

One of the key strengths of this quantitative approach was the ability to generate data that could easily be compared and analyzed. By utilizing fixed-response options, the survey provided data that the team could quantitatively analyze to identify common trends and opinions across participants.

The quantitative approach also had limitations. By using a fixed-response format, the views and thoughts of a participant would be restricted. This can lead to unexpected results due to participants interpreting questions differently than intended, as shown in figure 4.2.

Qualitative Method
To complement the quantitative data, the survey incorporated qualitative elements through open-ended comment fields. These fields allowed respondents to provide more detailed feedback and elaborate on their experiences and opinions regarding the current platforms.

This approach provided valuable context to the quantitative results, helping to explain some of the unexpected findings and offering deeper insights into user satisfaction and platform usage.

The addition of a qualitative element to the questions clarified the unexpected findings in figure 4.2. The general opinion on platforms was higher than anticipated, but this seemed to be for purposes that did not entail social learning. The open-ended comment fields showed a general displease with how the current platforms handled social learning, even though the platforms scored higher on the aspects they were used for.

By integrating both quantitative and qualitative methods, the survey achieved a balanced and comprehensive analysis. The quantitative data provided a broad overview and unbiased measurement of user satisfaction. The qualitative insights added depth and context, enhancing the overall understanding of the employees' needs and experiences.

5.1.1.2 Part 1: General Opinion on Current Platforms

The first part of the survey aimed to gain an understanding of the current situation regarding the tools and platforms used for collaboration at Tietoevry. The survey sought to evaluate user satisfaction, identify any issues, and understand the overall opinion towards these platforms.

Summary of Key Findings
The results, as presented in segment 4.1.1, showed a generally neutral opinion on the current platforms. The social aspects of these platforms, such as the ability to interact with other users, scored relatively high, reflecting their effectiveness in facilitating basic communication and collaboration.

However, a notable shortcoming across all platforms was the low rating for the display of relevant materials. Teams received the highest score in this category, with an average rating of 3.34, which still indicates a significant issue. This suggests that although these platforms are suitable for communication, they are lacking in effectively organizing and presenting learning materials.

Interpretation of Results
The neutral to slightly positive ratings for Teams and Workplace suggest that these platforms are generally accepted and used by employees, but they are not without flaws. The high ratings for social interaction features indicate that these platforms are effective for basic communication, such as video calls and chat functionalities. However, these interactions do not necessarily contribute to social learning, which requires more structured and relevant content sharing.

The low scores for the display of relevant materials highlight a critical gap in the current platforms' capabilities. Employees struggle to find and interact with the learning materials they need, which hinders their ability to engage in meaningful social learning. This aligns with the team's initial understanding that the current platforms do not fully support the organization's goals for social learning and competence development.

5.1.1.3 Part 2: Users' Needs and Requirements

The second part of the survey focused on identifying the specific needs and requirements of users with regard to social learning platforms. This section aimed to uncover core issues with the current platforms and determine the most important features for an improved solution.

Summary of Key Findings
The survey results revealed two primary issues with the current platforms: difficulty finding materials and information overload. These issues were identified through the question, "What, if any, are your biggest issues with the current platforms?" Out of 35 participants, 18 cited difficulty in finding materials, and 16 mentioned that the platforms show too much information. These findings align with the concerns highlighted in the first part of the survey, indicating a consistent problem with information organization and relevance.

The next question asked participants to identify the most important features of a social learning platform. As shown in Figure 4.3, user-friendliness and the display of relevant materials were the most important, with 28 out of 35 participants deeming these features as important. Additionally, about 50% of participants emphasized the importance of content filtration by topics or tags. These preferences reflect the users' need for a platform that is easy to navigate and that efficiently organizes and presents relevant learning materials.

Interpretation of Results
The identification of key issues such as difficulty in finding materials and information overload suggests that the current platforms are not effectively meeting users' needs for organized and accessible content. These problems hinder users' ability to engage in social learning, as they struggle to locate and interact with the materials they need.

The strong preference for user-friendliness and relevant material display indicates that any new platform must prioritize these aspects to be successful. Users want a platform that not only facilitates easy navigation but also ensures that the content presented is relevant to their learning needs. The emphasis on content filtration by topics or tags highlights the necessity for robust organization and filtration to help users find and interact with specific content quickly.

5.1.1.4 Do Employees Want Another Platform?

The final question of the survey asked, "If a new platform were to be developed, would you be open to try this out?" The results, shown in Figure 4.4, indicated a strong willingness among employees to adopt a new platform. 68.5% of participants expressed clear interest in trying a new solution, and notably, none of the participants did not wish to try a new platform due to their liking of the current platforms.

This enthusiasm suggests a significant opportunity for introducing a new platform, provided it addresses the identified needs and incorporates the desired features. However, the success of such a platform will depend heavily on its design and the extent to which it can deliver on user expectations for improved social learning capabilities.

5.1.1.5 Visibility and Engagement

One notable aspect of the survey was not derived from the survey directly, but rather from the insights gained from the statistics of the announcement about participation. The survey was posted to a potential audience of 4299 employees, yet only 2183, about half, saw the post. This statistic underscores the problem of feed bloating. The employees are shown a lot of content on the current platforms and likely causing important posts and updates to get lost in the sea of information, making it difficult for employees to see and engage with relevant content.

Of the 2183 employees who saw the post, only 35% read the entire post. Of these, only 35 people chose to participate in the survey. These low numbers indicate an issue with reaching out to the members, as well as low engagement. This can of course be for multiple reasons related to content, type of post and overall interest, but it suggests an underlying issue with user engagement and content drowning.

5.1.1.6 Sources of Error

In evaluating the survey results, several potential sources of error must be considered to understand the limitations and context of the findings.

Limited Number of Participants
One significant source of error is the relatively small sample size of 35 participants. While these responses provided valuable insights, a larger sample size would have offered more reliable results that would contribute to a deeper understanding of user needs and opinions. The limited number of participants may not fully represent the diverse perspectives and experiences of all employees at Tietoevry. As a consequence, the survey results could be biased toward the views of those who chose to participate, potentially overlooking important feedback from a broader user base.

Misinterpretation of Questions
Another source of error comes from the potential misinterpretation of survey questions. Vague or ambiguous questions can lead to varied understanding, resulting in unexpected results. An example of this was explained in the earlier part of this subsection regarding the qualitative method approach.

5.1.2 Filtration Strategy

To address the issues related to noise in the user feed, the team decided that a filtration strategy was necessary. The two main strategies explored were machine learning with a classification model and keyword-based filtration. These approaches are discussed in this subsection.

5.1.2.1 Machine Learning for Filtration

To implement machine learning for filtration, a classification model was iteratively trained and tested. This process resulted in three iterations, with each model exhibiting its own strengths and weaknesses.

These strengths and weaknesses are described in segment 4.1.3.1, but a brief overview is as follows:

- Iteration 1
  - Performed poorly, with misclassifications in both categories.
- Iteration 2
  - Performed well overall, but struggled with technological terms.
- Iteration 3
  - Performed well, but tended to over-classify groups as academic.

For the team to adopt a machine-learning model for filtration in the prototype, the model would need to perform well in both categories. The accuracy of the predictions would need to be high for real-world examples, and in cases of misclassification, it would be preferable to over-classify groups as academic rather than under-classify them.

The third model is the one that comes closest to meeting these criteria. Although over-classification is acceptable to some extent, the third model tended to classify every single-worded group name as academic, thereby failing to filter out much noise.

A final consideration when discussing machine learning for filtration is the approach used to train the model. The team aimed to quickly find and train a model without dedicating too much time to it, as it was not a core component of the concept. Azure AutoML was chosen for its promise of simplicity and speed.

Although exploring models using natural language processing (NLP) would have been interesting and potentially beneficial, Azure AutoML was chosen for its simplicity. Initially, the classification model provided by AutoML seemed promising based on the guide. However, it was later found that AutoML also includes NLP models with classification capabilities. Due to the limited time allocated for research into machine learning, this discovery was made too late to be explored further.

5.1.2.2 Keyword Filtration

With limited time allocated to research and testing of machine learning for filtration, the team also explored a simpler strategy with keyword-based filtration. This filtration revolved around using keywords to determine if a group was academic or not.

For this approach to be effective, the keywords needed to be adjusted to the data, using terms that are common in academic or non-academic groups. In the case of groups for learning, this meant using technological terms to identify groups related to educational topics. Another approach was to use non-technological terms to filter out groups containing keywords known to be non-academic, such as "Announcement" and "News".

Out of the two strategies, the latter proved to be more effective for the simple implementation in the prototype. This relates directly to the advantage of keyword-based filtration: its simplicity when dealing with small, well-known datasets. The downside is that using keywords for this purpose can be rigid, offering little flexibility and scalability.

Overall, keyword-based filtration showed good results in a simple implementation and was deemed a viable alternative to machine learning due to its simplicity.

5.1.2.3 Selected Filtration Strategy

After careful consideration and reviewing the pros and cons of each filtration strategy, keyword-based filtration was selected for use in the actual implementation. This approach was chosen due to its simplicity and accuracy and was used in the prototype to filter out groups with names that were not related to learning purposes.

The decision to proceed with the simplest strategy was influenced by time constraints and the complexity of implementation. When testing, the machine learning models proved to be inaccurate for the test data added to the platforms and were time-consuming to apply. Due to the structure of AutoML deployments, each group name would have to be filtered with a separate request, which would result in increased overhead.

The keyword-based filtration worked well and was highly customizable for a simple example like the prototype. However, for more complex scenarios, such as a full-scale integration, the performance of keyword-based filtration would likely decline.

In conclusion, keyword-based filtration was selected for this implementation. The purpose was to demonstrate the effectiveness of filtering rather than achieving the best possible result. A more comprehensive approach, potentially incorporating machine learning, would be more suitable for a larger-scale implementation. The potential for using machine learning for filtration was explored and holds promise for future enhancements.

5.1.3 Concept

The concept of Societo was developed to address the core issues identified through the research questions and the primary problem statement. This discussion will evaluate how effectively the concept meets the identified needs and the potential challenges in implementing it within Tietoevry.

5.1.3.1 Addressing Key Issues

This segment discusses how the concept addresses the identified key issues on current solutions. It focuses on the fragmentation of information, lack of accessibility and irrelevant content.

Fragmentation of Information
The primary issue of information fragmentation was addressed by integrating data from multiple existing platforms, like Workplace and Teams, into a single, unified interface. By doing so, Societo aims to centralize information, making it easier for employees to find and access relevant learning materials without having to navigate multiple platforms. This integration is crucial for creating a cohesive user experience and enhancing the efficiency of information retrieval.

Lack of Accessibility
To tackle the problem of accessibility, Societo was designed with a user-friendly interface that includes intuitive navigation elements, such as a global sidebar and navigation bar. These design choices are intended to minimize the learning curve for new users and ensure that all users can easily navigate the prototype. Additionally, the concept's advanced search and filtration options allow users to efficiently locate specific materials, further enhancing accessibility.

Irrelevant Content
One significant challenge identified was the presence of irrelevant content overwhelming users. Societo addresses this by prioritizing the dynamic organization and presentation of content. The prototype's ability to display the most relevant and recent information on the homepage and group pages ensures that users can quickly access relevant materials. Customizable dashboards or feeds that adapt to user preferences further enhance the relevance of the content presented.

5.1.3.2 Features and Technical Integration

User-Friendliness
The emphasis on an intuitive and consistent interface reflects the need for a platform that is easy to use and navigate. By adhering to Jakob's Law regarding familiar design conventions and ensuring that common tasks are easy to perform, Societo aims to provide a seamless user experience.

Dynamic Content Organization and Filtration
Societo prioritizes the dynamic organization and presentation of content to ensure users can quickly access the most relevant information. The concept provides advanced search and filtration options, allowing users to sort and find materials based on various criteria such as tags, topics, or dates. This helps users quickly locate relevant content and reduces the time spent looking through unnecessary information.

Interactive Features
The platform supports robust interaction capabilities, including post creation, tagging, commenting, and engaging in discussions. These interactive elements are vital for fostering collaboration and social learning among employees. By facilitating meaningful interactions, Societo aims to create a vibrant and engaging learning environment.

API Integration and Unified Interface
By utilizing APIs from Workplace and Teams, Societo aggregates and displays relevant data from multiple sources. This integration ensures that users have access to necessary information from various platforms in one place, enhancing accessibility. Presenting data through a consistent and clear interface reduces information scattering and enhances usability, allowing users to find and interact with materials more efficiently.

Data Organization
A system for categorizing and tagging content helps organizing data effectively. Automated tagging based on content analysis, user-generated tags, and categorization by topics and themes ensures that content is well-organized and easily searchable. This system supports efficient information retrieval and enhances the overall user experience.

5.1.3.3 Potential Challenges and Considerations

User Adoption and Training
One of the potential challenges of implementing a new platform in an organization is ensuring high user adoption. Despite user-friendly design and desired functionality, it can be a challenge to make employees change from their routines. Therefore, there needs to be focus on implementing the platform from higher holds in the organization as well as ensuring that the employees get sufficient training to be able to use the platform effectively.

Balancing Feature Richness with Simplicity
Another challenge is balancing the richness of features with simplicity. While it is important to provide a comprehensive set of tools and functionalities, it is equally important to maintain a clean and intuitive interface that does not overwhelm users.

5.1.4 Prototype

The prototype was developed as an attempt to realize the concept, which itself was designed to address the problem statement outlined in the beginning of the thesis. In this subsection, the results presented previously (4.1.5) will be discussed in detail.

To realize the concept into a prototype, the results from the survey were used to construct an interface that adhered to the principles of UI/UX design and aligned with user preferences. This included creating a user-friendly interface that was intuitive and easy to navigate.

Additionally, the prototype aimed to fully utilize the previously researched API integration. The goal was to generalize and display data from these platforms within the prototype, providing a seamless and efficient user experience. By doing so, the prototype sought to enhance collaborative engagement and knowledge sharing within the organization.

5.1.4.1 API Integration

The goal of the API integration was to create a system that could retrieve data from the external platforms Workplace and Teams. This integration was intended to centralize information, making it easier for users to access and interact with data from various sources on a single platform.

Strengths and Successes
The API integration was a significant success. Data from external platforms were generalized and displayed in an organized manner within the prototype. This not only made the data easily available but also allowed users to interact with the content directly on the prototype, even if it originated from another platform. These aspects collectively enhanced the user experience by ensuring the data was centralized and accessible, making the prototype functional and user-friendly.

The results from the API research also helped with the design decisions, by determining how content should be displayed in a tidy and readable manner.

Challenges
Although well-documented and robust, using the APIs posed several challenges. Despite their similar overall functionality, enabling the retrieval of comparable information from both platforms, key issues arose regarding continuous API access and differences in data extraction methods.

The primary challenge related to API access involved the team's independence from Tietoevry during the testing and creation of the API integration. This resulted in issues regarding access. To mitigate this, the team created free accounts to gain access to the Workplace API. Acquiring the key for API access was straightforward through creating an integration with the necessary permissions.

The Teams API was accessible to NTNU students via Microsoft's API Explorer. However, a limitation of utilizing NTNU's student access was the restricted permissions, preventing the team from creating their own integration and limiting direct API access. The team could access the API through the API explorer, but gaining access to the API outside of Microsoft's explorer proved to be difficult. Although the team could use the provided API key, it required renewal every 24 hours, complicating continuous integration. As a solution, data was extracted and stored in JSON files, which acted as a mock API. These files were created to simulate API access by structuring file paths similarly to API requests.

Additionally, the data structures from Workplace and Teams were different. The APIs provided varying data for similar endpoints, necessitating separate extraction processes for certain information. For instance, extracting comments required distinct methods for each platform. Once these issues were understood and addressed, organizing the data became more straightforward.

Overall, the integration of the APIs was successful, demonstrating the feasibility of the concept. The data presented to the user was uniform, appearing consistent regardless of its origin, creating a seamless interface for both existing and new content. Although the challenges in integrating the APIs were significant, they were ultimately resolved, achieving the goal of materializing the concept. Integration with continuous access for Tietoevry would be considerably simpler with direct control over their restrictions.

5.1.4.2 Wireframes Design

The wireframes were created to establish a clear design direction for the Societo prototype. These initial designs were based on extensive UI/UX research, user feedback from the survey, and the results from the API research and integration. The wireframes provided a solid starting point, giving the team a good foundation for the development phase.

Strengths and Successes
The creation of the wireframes showcased several strengths and successes. The wireframes were designed to be very easy to navigate, utilizing "Jakob's Law" to ensure users felt comfortable and familiar with the interface. Inspiration was drawn from familiar platforms such as Workplace, Teams, Reddit, and GitHub, particularly in terms of layout and design choices.

Challenges
Not many challenges were faced during the creation of the wireframes. However, it did take longer than expected to fully realize the research and achieve the right *feeling* for the design. While the wireframes helped significantly, some design choices were for functionalities that ultimately were not implemented due to time constraints. Most of these functionalities were too excessive for a prototype and went beyond the scope of what was necessary to demonstrate the core concepts, and were therefore dropped.

5.1.4.3 Functionality and Design

The aim was to create a functional prototype, allowing users to interact with it, beyond mere wireframes or basic design concepts. The goal was to combine the findings from the UI/UX research , API research, and integration into a comprehensive prototype. This prototype was showcased to the task assignor at Tietoevry. The primary objective was to create a prototype where users could access relevant information regarding their work from multiple sources in one place.

Strengths and Successes
The prototype successfully integrated the design principles and most of the functionality researched. The user interface was intuitive and easy to navigate. The API integration provided information from various platforms, ensuring that users only needed to access Societo to get all the updates and data relevant to social learning.

Challenges
The development process faced several challenges. Creating a prototype that was both functional and user-friendly within the project timeline was difficult. Additionally, some of the tools and technologies used were new to the team, and it took some time to learn best practices. However, due to their ease of use, the team quickly adapted. Another challenge was that development had to be rushed, as more time than anticipated was spent on the initial phases of the project.

Another challenge of the development was the limited insight into Tietoevry's existing internal social learning platform (Cornerstone) and the general daily operations of a typical employee. Although the team was shown this internal platform in video meetings with the task assignor and given a demonstration of how it worked, the team did not have direct access to the platform. This made it difficult to rely on memory of how it looked and functioned, complicating the design and development processes. This made it harder to estimate what was specifically needed and what to avoid. Due to this limited exposure, Cornerstone did not significantly influence the method or development phase.

5.1.5 Prototype User Testing

This subsection discusses the results of the user testing described in subsection 3.5.4, focusing on how these results address the project's objectives. The user testing aimed to assess the usability, functionality, and user satisfaction of the prototype, gathering insights that were paramount for the final evaluation of the project.

5.1.5.1 Key Findings

Participants generally found the prototype to be intuitive and efficient, suggesting that the design and functionality align well with user expectations for a social learning platform. The core functionality of the prototype being a more structured approach to the existing solutions was acknowledged by the participants, indicating the interest and need for the prototype.

5.1.5.2 Usability

The users proclaimed satisfaction with the look and feel of the prototype. Three out of four participants said that the prototype was easy to use since it worked similarly to what the participants were used to. This is a great finding for the group as it has been one of the aspects that was researched and implemented with the intention of making the usability of the prototype better.

The participants also gave the team valuable feedback on features that could further enhance the usability like the addition of colorized tags. Feedback like this proves the importance of user testing since this was not something the team had thought about earlier.

5.1.5.3 Functionality

The participants all agreed that core functionality of filtration and organization of data was of great value. The team regards this as very positive since it strengthens the concept as a solution.

As with usability, the participants gave feedback on matters of improvement. The feedback on functionality was in line with the team regarded as future work as the prototype is still not fully functional. The feedback on functionality also agreed with the ideas of the concept that had not yet been implemented, further confirming the concept.

5.1.5.4 Sources of Error

Several sources of error could have impacted the validity of the testing results. The small sample size of participants limits how much the feedback reflects on general opinion. Given that the users who decided to participate presumably are more interested in this topic than the general employee, the feedback could potentially be overly positive. Additionally, the testing method, which was more controlled and less reflective of typical usage scenarios, might have influenced user behavior and feedback since the participants did not navigate the prototype without instructions.

Participants were recruited for testing through the deployment of a form in social groups within Tietoevry. The participants had to sign up for testing and were given no other incentive to join other than helping the team's bachelor thesis. To achieve higher participation, the recruitment process could have been more thoroughly thought out and happened at an earlier part of the project than it did.

5.1.6 Rework

The rework phase was initiated after gathering feedback during user testing. This subsection discusses the results of this rework. The goal was to improve the prototype based on user suggestions, prioritizing impactful changes that were not too time-consuming.

5.1.6.1 Impact

Many of the suggested features from the feedback were successfully implemented, making the prototype's user experience much better. This led to several key improvements in the prototype. For instance, the repositioning and color-coding of tags improved visibility and recognition. The ability to click on attachments directly from the feed reduced unnecessary navigation. Adding icons to material cards clarified their origins,

and indicating search parameters made the search function more intuitive. These enhancements collectively contributed to a more seamless user experience, ultimately making the prototype a more effective tool for addressing the problem statement.

5.1.6.2 Challenges

The main challenge during the rework process was the limited time available. Some of the requested features could not be implemented due to time constraints. It was necessary to spend time figuring out what was feasible, what was not needed for the prototype, and what was just not possible within the given time frame. As an example, adding gamification was not possible as it would involve a significant expansion and complete overhaul of some pages and functionalities. Additionally, it would require further insight into Tietoevry's day-to-day operations, which was not available.

5.2 Administrative Results

This section evaluates the administrative aspects of the project, detailing how planning and management approaches contributed to its execution and outcome. The implementation and effectiveness of the project plan, time management strategies, and project management methodologies will also be discussed.

5.2.1 Project Plan

The Gantt chart explained in subsection 4.2.1 was used to tackle the challenge of project structuring and time management from an overall perspective. This chart helped maintain a clear path for project execution and ensured that too much time was not spent on any one part of the project. There were however changes from the original plan detailed in the Gantt chart. The original plan entailed two test phases with a rework of the prototype between the tests. This proved to be unachievable given the time constraints of the project. The team would not have been able to recruit participants and make significant changes to the prototype to see any benefit from the original structure.

5.2.2 Project Management

The project management approach evolved throughout the project. The team initially planned to use a Scrum development methodology but quickly realized the need for a change in approach that fit the time constraints and necessities of the project.

5.2.2.1 Change in Approach

Scrum is a development approach that emphasizes iterative development and frequent reassessment of project goals. This process contains many elements, such as sprint reviews and retrospectives, that direct time away from actual product development. As the team was a rather small group consisting of three members, combined with the

lack of a structured list of requirements, the documentation processes of Scrum were deemed too excessive and time-consuming to justify. The decision was then made to alter the approach to something that required less effort and documentation while still providing the team with structure and progress measurement. The choice landed on a combination of Kanban board and GitHub Issues.

5.2.2.2 Success of Approach Change

The change in approach allowed the team to work in a way that focused on developing the prototype while handling manageable tasks created on the Kanban board. The use of GitHub Issues facilitated clarity and effective collaboration by displaying what tasks were currently being worked on and who was working on them. The team regards the change in approach as successful, as it provided adequate tools for managing the project while allowing for an effective and smooth development process.

5.3 Answering the Research Questions

The following subsections provide detailed answers to the research questions outlined at the beginning of the thesis. Each research question has been addressed through specific methodologies and findings that the team employed throughout the project.

5.3.1 Research Question 1

Which features/attributes do employees consider important for a social learning platform, and how do these features align with the shortcomings of existing platforms used in the organization?

To answer this question, the team conducted a survey as presented in subsection 4.1.1. The survey results highlighted several key features for a social learning platform:

- **User-Friendly Interface:** Employees emphasized the need for an intuitive platform that is easy to navigate.
- **Relevant Material Display:** The platform should prioritize showing users the most relevant materials.
- **Advanced Content Filtration:** The ability to filter materials by topics or tags to expedite the process of finding specific content.

These features directly address the shortcomings of existing platforms, which were noted for their difficulty in navigation, lack of relevant content display, and inefficient search capabilities.

5.3.2 Research Question 2

How can the information available on platforms like Workplace and Teams be analyzed, organized, and generalized to support cohesive integration into a new social learning platform?

To answer this question, the team researched the available APIs and explored the potential of machine learning to filter and organize data for a unified interface in Societo. The objective was to create a cohesive integration of information from multiple platforms.

The team found the following results:

- **Data Extraction and Uniformity:** Extract data from various platforms and standardize it into a unified format suitable for Societo.
- **AI-Based Analysis:** Implement machine learning algorithms to analyze and identify relevant materials automatically.
- **Unified Organization:** Gather dispersed groups and channels into single, cohesive groups where relevant information from multiple platforms is displayed in an organized manner.

5.4 Answering the Problem Statement

How can an organization facilitate social learning by ensuring that information sharing is centralized, accessible, yet relevant and supportive of collaboration?

The answer the team found to this problem is the concept of Societo, which integrates important features identified through research in a way that makes it easier for employees to find what they are looking for. By centralizing information from multiple platforms, enhancing accessibility with a user-friendly interface, and ensuring the relevance of content through advanced filtration and AI-based analysis, Societo addresses the core issues of information fragmentation, accessibility, and content relevance. This integrated approach supports a collaborative and efficient social learning environment within the organization. The developed prototype materializes the concept and serves as an example of how an implementation could look like.

6 Conclusion and Future Work

The problem statement addressed in this thesis was: ”How can an organization facilitate social learning by ensuring that information sharing is centralized, accessible, yet relevant and supportive of collaboration?”. This study focused on the development and evaluation of the prototype platform, Societo, with the aim of enhancing social learning and collaboration at Tietoevry. The research involved exploring UI/UX principles, API integration, and user feedback to create an effective and user-friendly alternative to the current platforms used for social learning at Tietoevry.

6.1 Conclusion

The development of Societo was driven by a need to address key issues identified through thorough research and user feedback. The primary issues with existing platforms were information fragmentation, lack of accessibility, and irrelevant content. By integrating content from multiple platforms, Societo aimed to centralize information and provide a cohesive, user-friendly interface.

User testing and feedback indicated that the prototype met the core needs of the employees at Tietoevry, with participants finding the platform intuitive and efficient. The integration of UI/UX principles and API functionalities played a crucial role in achieving these results.

While the prototype shows promise regarding the identified issues, certain conditions must be met for the platform to be truly successful. There needs to be a corporate learning culture that embraces the need for continuous learning. For the platform to gain traction, it is essential for leaders within the organization to actively support and promote the use of the new platform. Managers should lead by example by using the platform and integrating it into their daily routines, as expressed by a Global Learning and Development Specialist at Tietoevry: ”And of course it has to start from the top, if we take a conscious decision to improve this, then there has to be a top management buy in.”

This thesis represents a confident step towards solving the issues of social learning within tech organizations. By addressing the core problems of information fragmentation, lack of accessibility, and irrelevant content, Societo demonstrates a viable solution that can significantly enhance the learning and collaboration experience for employees. This work lays a strong foundation for future developments in social learning platforms, particularly within the tech industry.

6.2 Future Work

While the Societo prototype shows promise, there are areas for future work to further enhance the platform and ensure its success.

6.2.1 Full-Scale Development and Integration

This prototype demonstrates a viable solution to the addressed problem, but it still needs work to become a fully-fledged platform suitable for actual use. Future work would involve several key implementations:

6.2.1.1 Data Integration

To move beyond the prototype stage, Societo must integrate with existing Tietoevry platforms by gaining access into the internal systems and APIs. This includes real-time data synchronizations ensuring that all materials are accurately reflected across all systems.

6.2.1.2 User and Access Management

The prototype did not implement user management, but this is an integral part of a social learning platform. Leveraging existing Tietoevry user management solutions can simplify user handling. This involves exploring options for single sign-on capabilities.

6.2.1.3 Scalability

The platform needs to be able to handle a large number of users as well as steadily increasing amounts of data. Load balancing, distribution of databases and cloud infrastructure will be important in maintaining performance and reliability as the platform scales.

6.2.1.4 Testing and Quality Assurance

Tests concerning functionality and stability should be conducted to ensure reliability in actual use. Continued identification of bugs or issues will be important to make sure the platform functions on deployment.

6.2.2 Gamification Features

Research into gamification will be important for advancing the concept and prototype. Including elements that promote active contribution by rewarding users in different capacities can enhance user engagement and create a more dynamic learning environment. Here are some strategies that could be looked into:

6.2.2.1 Points and Badges

The current prototype has introduced the concept of awarding points for various activities, such as posting in a group, but this functionality is not fully implemented.

These actions could form the basis of a point system where different activities reward points. These points could then be used to earn badges, which serve as a visual representation of users' achievements.

6.2.2.2 Leaderboards

Introducing leaderboards that rank users based on their activity and contributions can create a healthy competitive spirit. This can also help management identify active contributors to social learning and reward them accordingly.

6.2.2.3 Reward Systems

Rewards could be integrated with the points and leaderboards discussed previously to recognize employee efforts. These rewards would depend on the organization, but could include items like gift cards or professional development opportunities to motivate users to engage with the platform and promote social learning.

6.2.3 Machine Learning

The thesis explored two main filtration strategies, with keyword filtration being chosen due to its simple integration. Despite this, machine learning showed promising results and could be very useful in a larger-scale implementation. Incorporating a working machine learning algorithm that can accurately discern relevant data from irrelevant data will help address the issue of noisy feeds. Integrating a model that uses NLP would greatly benefit the filtering of groups.

7 Societal Impact

The thesis was executed in collaboration with Tietoevry, a large company within the tech industry. This chapter will outline the societal impacts of the work done in this thesis, focusing on the effects it might have both within and outside the company. The concept developed to answer the problem statement is aimed at increasing efficiency, knowledge, and social interactions for learning purposes within the company. The concept and prototype were presented to the task assignor but could be of interest to a large range of companies and industries using digital workplaces with a desire to educate employees.

7.1 Economical Impact

The developed prototype for the designed concept has the potential for significant positive economic implications for Tietoevry. By actively promoting and facilitating continuous learning and upskilling of employees, as stated in section 2.2, the company can reduce the need to hire new personnel, thereby saving on recruitment and training costs. Additionally, the concept facilitates a more efficient digital workplace, which could eventually reduce the need for physical office spaces, leading to further cost savings. This shift not only improves the company's bottom line but also aligns with broader economic trends toward remote and hybrid work models.

7.2 Social Impact

Beyond the company itself, the social impact of this work is notable. The concept demonstrates how collaboration and digital workplaces can enhance learning and knowledge sharing, which is of general interest. By promoting these practices, the project highlights the potential for wide adoption across various industries, pushing for a culture of continuous learning and development. This can lead to a more knowledgeable and skilled workforce, benefiting society as a whole by encouraging innovation and productivity.

7.3 Sustainability

From a sustainability perspective, there is one notable consideration to look into. This regards the effects of increasing the knowledge of a workforce, leading to a set of workers better equipped to tackle the challenges to come. Especially in the field of engineering, innovation is an important part of the skill set needed to succeed and create solutions that are built to last. The concept contributes to this by facilitating social learning and communication, allowing employees to self-develop and assist others in doing so.

In summary, the concept developed in this thesis has the potential to make significant economic, social, and sustainability impacts. By directing attention to continuous learning and efficient digital workplaces, the project can benefit Tietoevry and other organizations while promoting broader societal and environmental goals.

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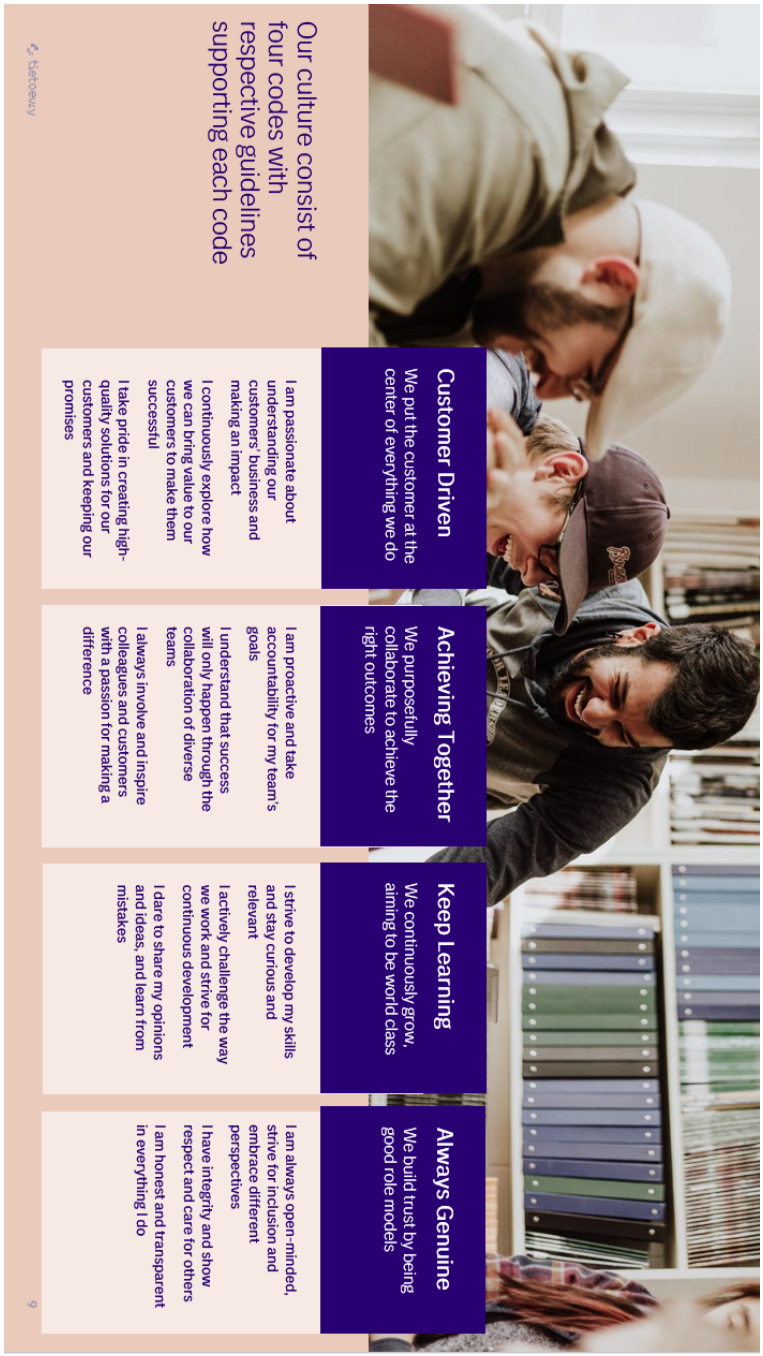
Appendix

A Tietoevry Learning Culture (Source: Tietoevry Internal Documentation)



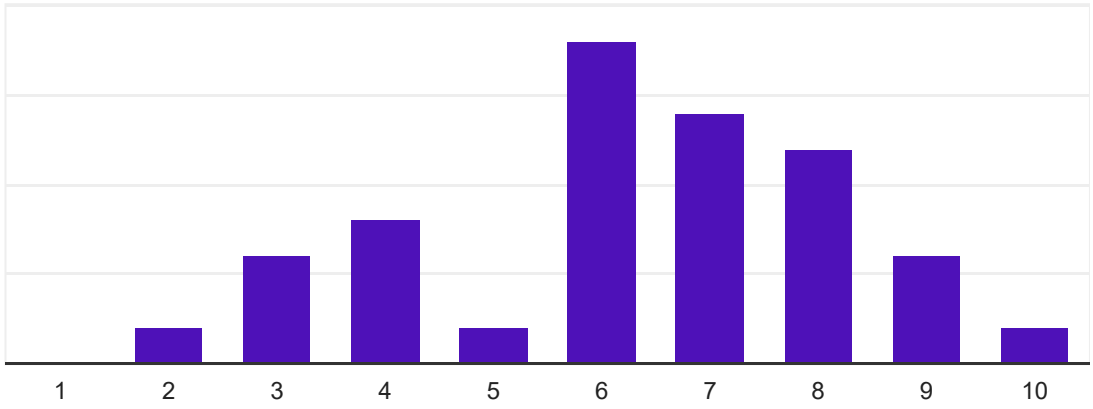
B Survey Results

Survey of Tools and Platforms for Collaboration

Current platforms

How happy are you with the current ways of social learning and sharing of learning materials (Teams, Workplace, Cornerstone)

Copy



The platform ...

is useful

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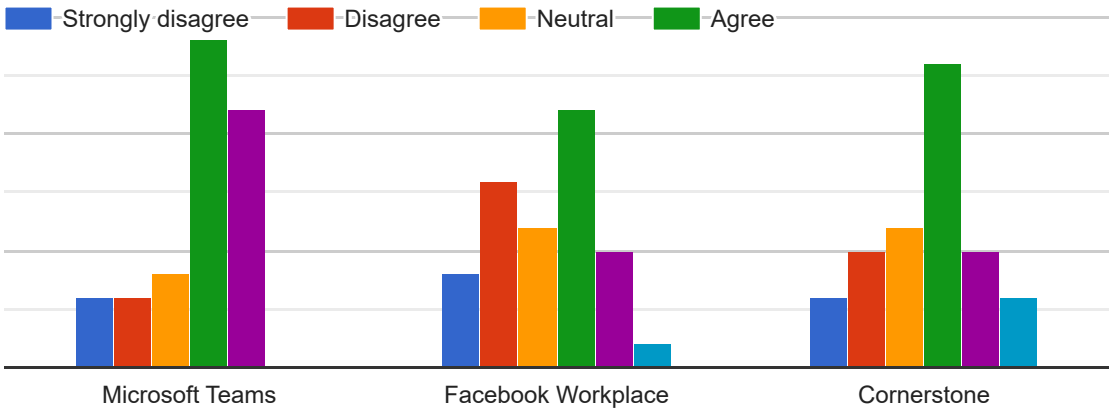

Comment (optional)

6 answers

Knowledge sharing can also be done effectively by distributing refreshers/reminders for the team using emails (Outlook).

Sharing and competence development are in my view fundamental different and require a different platform and tool. Basically they could be combined but as of the existing when considering both, none of the options would be on the positive side the way they are used now. So there is a strong risk in this survey to get a high inaccuracy. While Teams is very good for sharing it is currently not used for competence building (at least for me).
And Cornerstone feels only used for courses but not for own sharing (even I might be able to add my own content but I am not trained for that).

Cornerstone has very inconvenient user interface. Microsoft Teams is also very confusing even for work project communication: it is good only for video conferencing. Workplace is only good for the announcements.

Only one these tools is designed for knowledge sharing and even it pretty bad, especially from a content creators perspective.

I have no clue what competence development is available on teams? Workplace is also a good place find information regarding potential learning opportunities.

I haven't used cornerstone.

provides a good user experience

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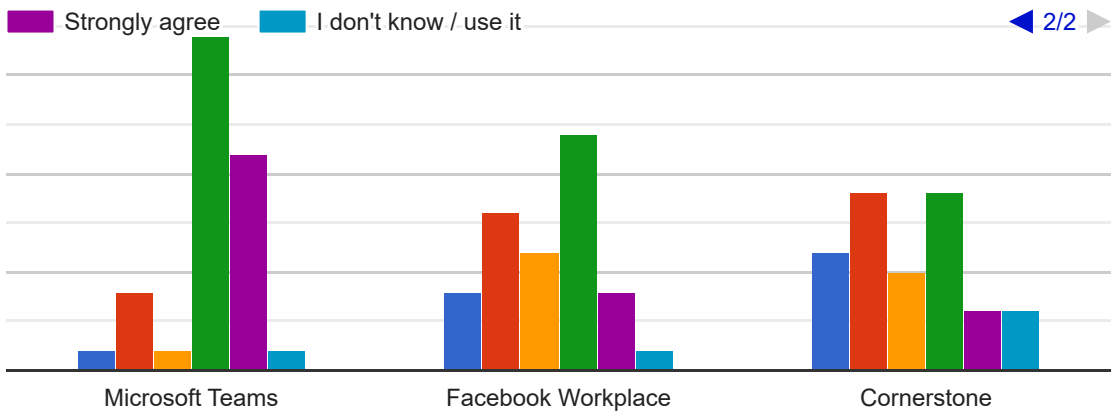

Comment (optional)

3 answers

Cornerstone does not feel like it was even tested on regular users. It's like it was built by developers for developers.

where do we learn in teams? or that is ment HUB?

Workplace is super messy. Cornerstone unclear and no clear learning paths.

is something I regularly use

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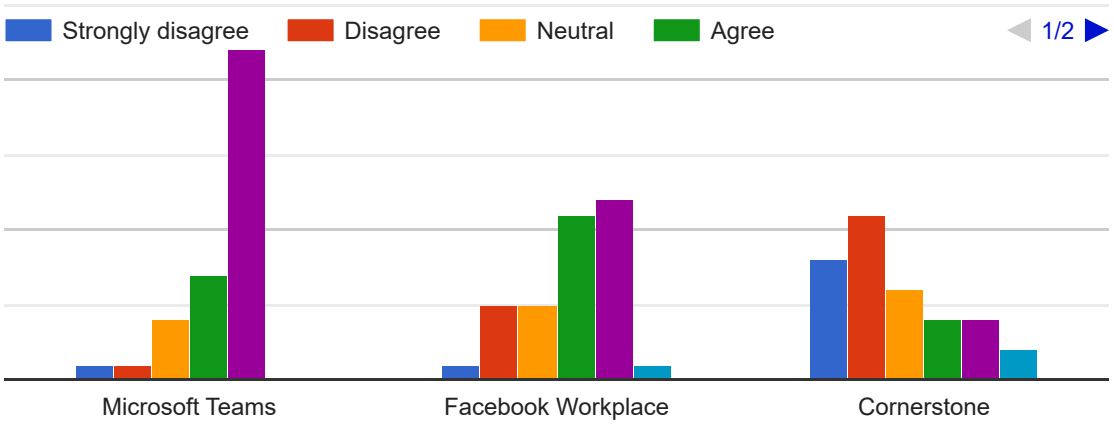

Comment (optional)

3 answers

Teams an Workplace are hard escspe, even thoug they do not provide a very good experience.

I do not use these much for competence development.

shows me relevant materials

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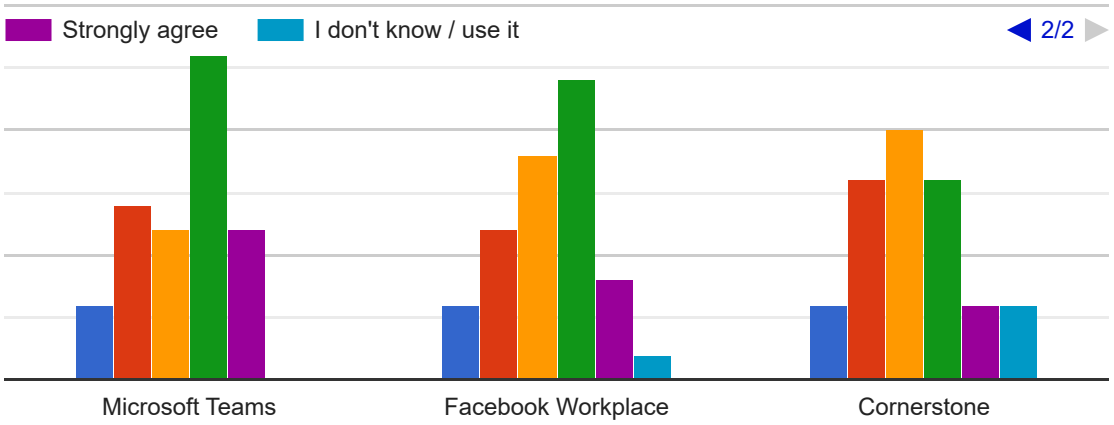

Comment (optional)

2 answers

I think Teams isn't really used for anything else, but joining learning sessions announced somewhere else. Cornerstone has lots of content, but some of it seem deprecated (for example, there seem to be lots of events that are not updated and dont have upcoming sessions).

Very confusing question. I look for material that I need to find.

is simple to navigate

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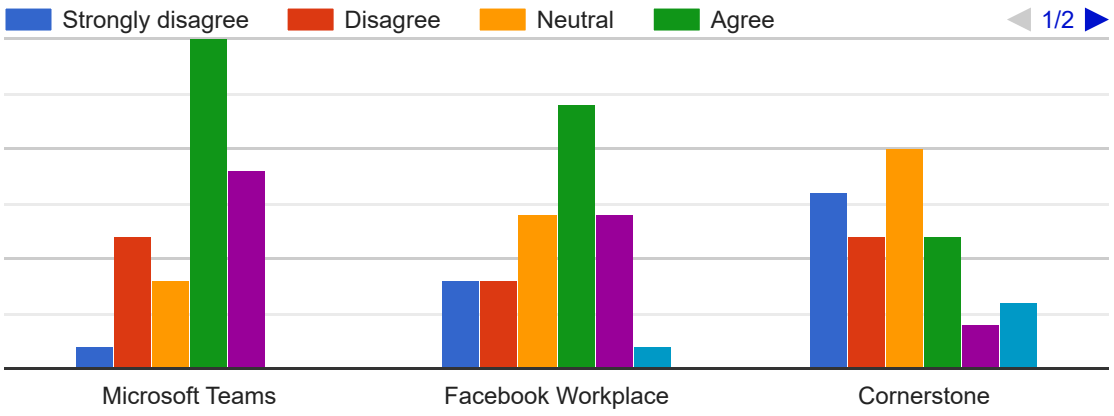

Comment (optional)

1 answer

Microsoft Teams has tons of features and integrations, but at the same time it is not easy to navigate and use them. Even a document sharing and then subsequent finding of it can turn into a difficult task.

allows me to interact with other users and their content

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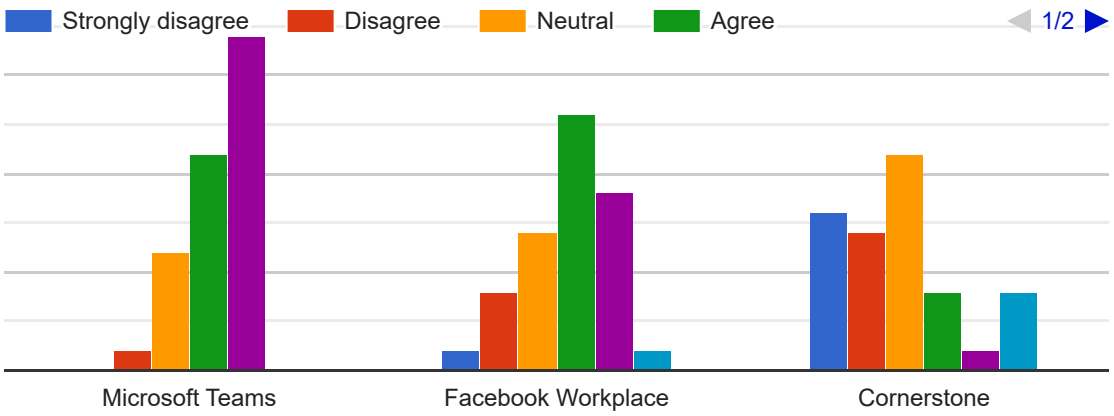

Comment (optional)

0 answers

There are currently no answers to this question.

Requirements and needs

What, if any, are your biggest issues with the current platforms?

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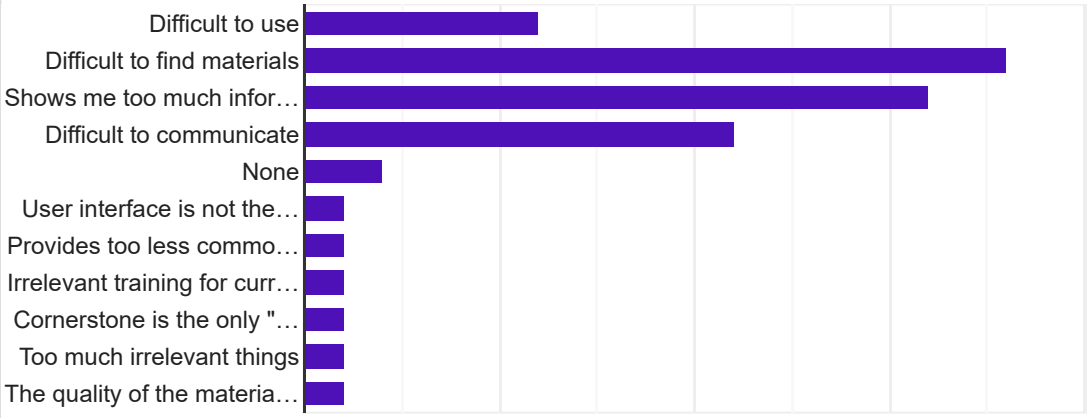

Comment (optional)

1 answer

Difficult to find relevant materials.

What are the most important features for a social learning platform, in your opinion?

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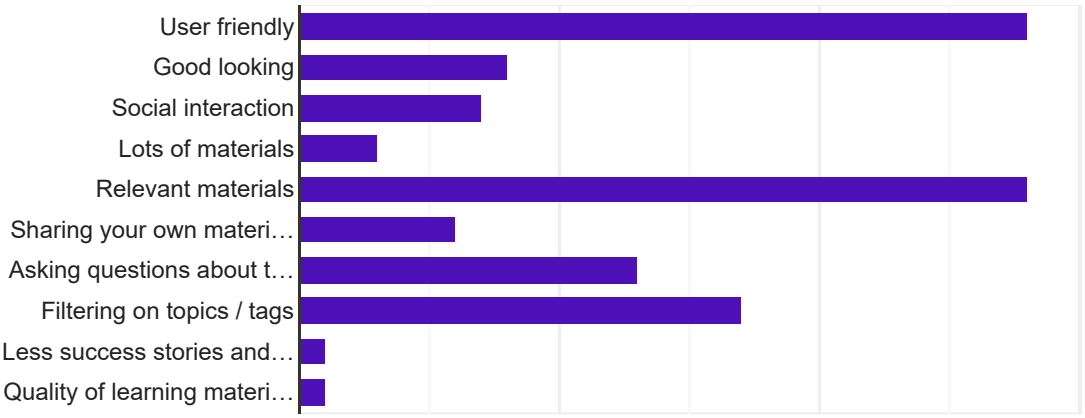


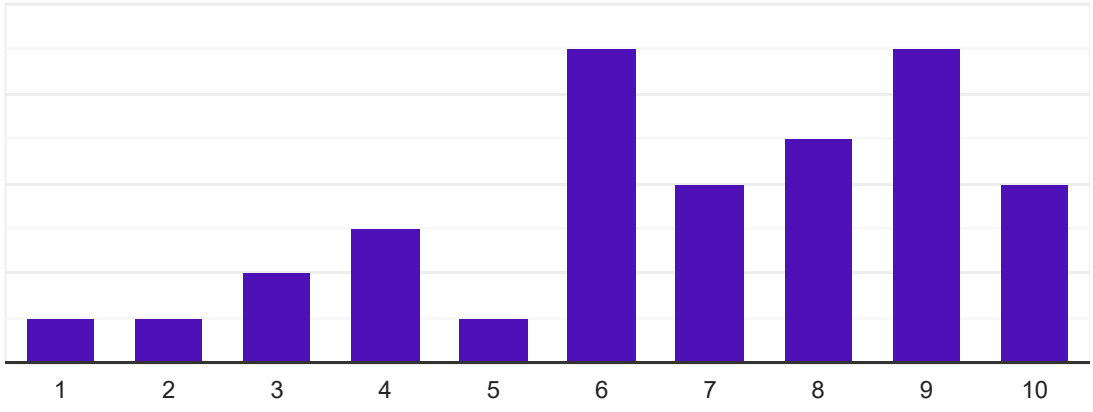
Comment (optional)

1 answer

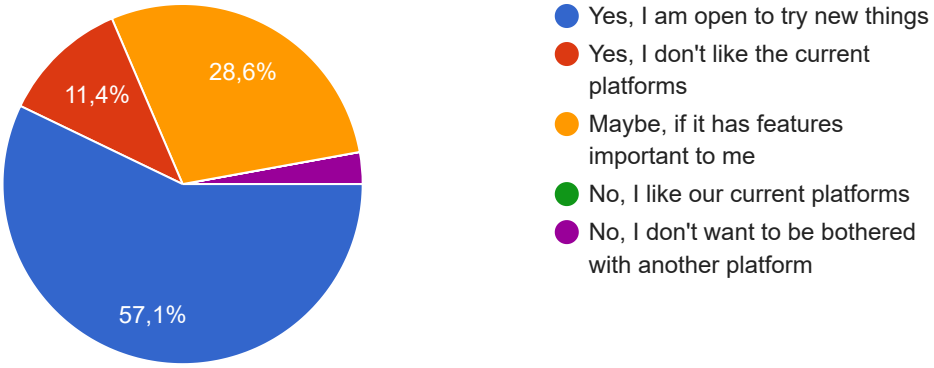
Materials are grouped or tagged by a theme/topic, they can be arranged and organized by the difficulty level. There are comments from colleagues about the quality of the material and their rating rating of the material. There should be also an AI analysis of those comments, so that new learners can read a brief summary and decide easier if they should spend time on this course.

How important is social interaction and co-operation for your learning?

Copy



If a new platform was to be developed, would you be open to try this out? Copy



Comment (optional)

2 answers

I am an early adaptor.

Please give me something new.

C User tests

Facilitators:
Aleksander Olsvik
Sander Olin Johansen 29.04.2024

User Test 1

1. **Brief introduction to the platform and concept**

2. **Introductory questions:**
   - *How familiar are you with the current platforms available for information sharing and social learning?*
     Answer:

I am familiar with all the platforms available today. Relatively new to the company but work closely with Cornerstone

   - *How do you feel about the individual platforms?*
     Answer:

Cornerstone has a lot of good functionality which is under-utilised. Provides good learning paths and such which is good. Teams and Workplace are good for their purposes, but not for social learning specifically.

3. **Tasks:**

- ☑ ~~*Name the two groups you are a member of*~~
- ☑ ~~*Navigate to the page for existing groups*~~
  - ☑ ~~*Join a group with name "Frontend Designers"*~~
  - ☑ ~~*Add a comment on one of the posts*~~
  - ☑ ~~*Leave the group and go to homepage*~~
- ☑ ~~*Find out what groups from Workplace and Teams are represented in the group Tech Toolbox*~~
  - ☑ ~~*Find all shared materials in this group*~~
- ☑ ~~*Go to view all posts*~~
  - ☑ ~~*List the following from the post, if present:*~~
    - ☑ ~~*Group Name*~~
    - ☑ ~~*User Name*~~
    - ☑ ~~*Platform*~~
    - ☑ ~~*Attachments*~~
    - ☑ ~~*Tags*~~
- ☑ ~~*Navigate to a group without using the sidebar*~~

Notes:
The user is able to execute the tasks with little to no struggle. The user says that it is easy to use since it is similar to interface the user is used to.

4. **Post test questions:**
   - *Do you think there is any value to what we're trying to do?*
     Answer:

     Yes there is absolutely value in the concept. Collecting information from all the platforms and gathering them in one place is nice, especially for learning purposes.

   - *What parts of the platform do you like with this in mind?*
     Answer:

     The platform has an intuitive and well-known feel. It looks similar to other platforms I am familiar with, so understanding how it works isn't difficult. Looks good as well.

   - *What parts would need improvement?*
     Answer:

     I miss some of the functionality from Cornerstone, such as learning paths and focus on competence. Having paths for different roles, suggested materials and other core functionality that Cornerstone provides can improve the learning aspects. The social part of it is good.

   - *With all of the things you have mentioned, would you use this platform?*
     Answer:

     Yes, absolutely. I think it looks good, is a smart solution and most importantly makes it easier for me to find materials I'm looking for. The struggle of looking for things between platforms can be annoying, so I like the idea for this purpose of gathering thing.

Facilitators:
Aleksander Olsvik
Joakim Falch

30.04.2024

User Test 2

1. **Brief introduction to the platform and concept**

2. **Introductory questions:**
   - *How familiar are you with the current platforms available for information sharing and social learning?*
     Answer:

I am familiar with Teams, Workplace and Cornerstone. I mostly use Workplace for information gathering, I use Teams mostly for meetings like now.

   - *How do you feel about the individual platforms?*
     Answer:

Teams is fine with my use, it serves its purpose as a meeting facilitator. In Workplace information is scattered and there are so many groups that it's hard to find relevant materials again after you have found them. Cornerstone is not really on my list of daily used applications, but it is nice to be able to find recordings of events that has happened.

3. **Tasks:**

- ☑ ~~*Name the two groups you are a member of*~~
- ☑ ~~*Navigate to the page for existing groups*~~
  - ☑ ~~*Join a group with name "Frontend Designers"*~~
  - ☑ ~~*Add a comment on one of the posts*~~
  - ☑ ~~*Leave the group and go to homepage*~~
- ☑ ~~*Find out what groups from Workplace and Teams are represented in the group Tech Toolbox*~~
  - ☑ ~~*Find all shared materials in this group*~~
- ☑ ~~*Go to view all posts*~~
  - ☑ ~~*List the following from the post, if present:*~~
    - ☑ ~~*Group Name*~~
    - ☑ ~~*User Name*~~
    - ☑ ~~*Platform*~~
    - ☑ ~~*Attachments*~~
    - ☑ ~~*Tags*~~
- ☑ ~~*Navigate to a group without using the sidebar*~~

Notes:
The user is able to complete all the tasks with ease, the tasks are executed fast and the user shows no signs of frustration.

4. **Post test questions:**
   - *Do you think there is any value to what we're trying to do?*
     Answer:

     Yes i definitely see the value in this concept. The opportunity to combine and centralize data to a single platform makes it much easier to be able to find things I'm looking for.

   - *What parts of the platform do you like with this in mind?*
     Answer:

     The interface looks good and is really intuitive, it looks how I would want a platform like this to look. The filtration of "usable content" is a great feature and should really help solve the problem of information drowning that happens at Workplace at the moment.

   - *What parts would need improvement?*
     Answer:

     It is a great prototype, but obviously needs further general development to see use. Other than that I think it represents the concept you explained in the start in a good way.

   - *With all of the things you have mentioned, would you use this platform?*
     Answer:

     Yes I would be open to use this platform in order to get information from different platforms. The ability to get a feed that only covers a certain field of information is really useful in information finding. A good search engine to be able to find materials easily would be of import though.

Facilitators:
Aleksander Olsvik
Joakim Falch

30.04.2024

User Test 3

1. **Brief introduction to the platform and concept**

2. **Introductory questions:**
   - *How familiar are you with the current platforms available for information sharing and social learning?*
     Answer:

     I use Teams and Workplace a lot. I am in a lot of meetings so Teams is a natural part of my work day and I use Workplace to get feedback and post about events. I do not use Cornerstone on a day to day basis.

   - *How do you feel about the individual platforms?*
     Answer:

     I like Workplace since it's kind of like Facebook, most of my time spent on platforms is on Workplace. I also like Teams, but it's not really the same usage. Teams is more for static information, while Workplace works a bit more dynamically. Cornerstone is kind of hard find what you are looking for.

3. **Tasks:**

- ☑ ~~*Name the two groups you are a member of*~~
- ☑ ~~*Navigate to the page for existing groups*~~
  - ☑ ~~*Join a group with name "Frontend Designers"*~~
  - ☑ ~~*Add a comment on one of the posts*~~
  - ☑ ~~*Leave the group and go to homepage*~~
- ☑ ~~*Find out what groups from Workplace and Teams are represented in the group Tech Toolbox*~~
  - ☑ ~~*Find all shared materials in this group*~~
- ☑ ~~*Go to view all posts*~~
  - ☑ ~~*List the following from the post, if present:*~~
    - ☑ ~~*Group Name*~~
    - ☑ ~~*User Name*~~
    - ☑ ~~*Platform*~~
    - ☑ ~~*Attachments*~~
    - ☑ ~~*Tags*~~
- ☑ ~~*Navigate to a group without using the sidebar*~~

Notes:
The user is able to execute the given tasks, but gives feedback on the need for contrasts on things like tags, since it can be somewhat hard to see when it is the same color as everything else on the post. User proclaimed it was simple to navigate the platform.

4. **Post test questions:**
   - *Do you think there is any value to what we're trying to do?*
     Answer:

     Yes I think it has value in different ways. In the learning aspect it has value in not bloating the user feed with unnecessary posts about irrelevant things, unnecessary content is a problem today, and it makes people not want to contribute. It has value in ways to find people with certain knowledge if you can see members of groups.

   - *What parts of the platform do you like with this in mind?*
     Answer:

     Navigation and interaction with the platform was easy, it needs to be simple to work. I like the "top posters" section, incentivisation and is really important to make people contribute, and it makes it easier for leaders to see who contributes.

   - *What parts would need improvement?*
     Answer:

     It needs to display the content of a post more clearly. Color the tags and make things stand out from each other. The ability to see all posts with a certain tag would also be a good feature. It should also be implemented options for more post types like polls and events. Further work on making it "rewarding" for a user to contribute would also benefit the purpose.

   - *With all of the things you have mentioned, would you use this platform?*
     Answer:

     Yes I think it is a great concept. I am happy that you are working on this, and I am interested in the work as a whole. Social learning and development are important, and the work your thesis entails is very interesting.

Facilitators:
Aleksander Olsvik
Joakim Falch
Sander Olin Johansen 03.05.2024

User Test 4

1. **Brief introduction to the platform and concept**

2. **Introductory questions:**
   - *How familiar are you with the current platforms available for information sharing and social learning?*
     Answer:

I am familiar with all the platforms available today.

   - *How do you feel about the individual platforms?*
     Answer:

Workplace is a bit chaotic, you kind of drown in the feed and it displays a lot of unimportant information. Teams is fine, but the folder structure can be a bit difficult to navigate. Cornerstone has clunky functionality and isn't really intuitive.

3. **Tasks:**

- ☑ ~~*Name the two groups you are a member of*~~
- ☑ ~~*Navigate to the page for existing groups*~~
  - ☑ ~~*Join a group with name "Frontend Designers"*~~
  - ☑ ~~*Add a comment on one of the posts*~~
  - ☑ ~~*Leave the group and go to homepage*~~
- ☑ ~~*Find out what groups from Workplace and Teams are represented in the group Tech Toolbox*~~
  - ☑ ~~*Find all shared materials in this group*~~
- ☑ ~~*Go to view all posts*~~
  - ☑ ~~*List the following from the post, if present:*~~
    - ☑ ~~*Group Name*~~
    - ☑ ~~*User Name*~~
    - ☑ ~~*Platform*~~
    - ☑ ~~*Attachments*~~
    - ☑ ~~*Tags*~~

☑ ~~*Navigate to a group without using the sidebar*~~

Notes: The user is able to execute the tasks with little to no struggle. The user says that it is easy to use since it is similar to interface the user is used to.

4. **Post test questions:**
   - *Do you think there is any value to what we're trying to do?*
     Answer:

Yes there is definite value in the concept. Centralized and organized learning material is lacking at the moment.

   - *What parts of the platform do you like with this in mind?*
     Answer:

The platform is intuitive and works in a similar way to what I am used to. I like that you only get what you want. The filtration of data is much needed.

   - *What parts would need improvement?*
     Answer:

There are some technical issues that would make the experience better. When you join a group it should automatically be shown in the sidebar without the need for refreshing. There should be an indication of which platform the material came from. You should automatically be a member of a group you create, and it should be more clearly be stated that the groups are existing groups in other platforms when creating a new group.

   - *With all of the things you have mentioned, would you use this platform?*
     Answer:

Yes I would be open to trying the platform. I think option for flexibility in platform choice internally in the organization is good, and this would be an addition to this. I like how it gathers and organizes the information that is scattered on different platforms today.

D Gantt Diagram

Bachelor thesis

Aleksander Olsvik, Joakim Falch and Sander Olin Johansen

Project start: **08.01.2024**

Display week: **1**

SIMPLE GANTT CHART by Vertex42.com
https://www.vertex42.com/ExcelTemplates/simple-gantt-chart.html

TASK	START	END
Starting phase		
Initial agreements and discussions	08.01.24	12.01.24
Define problem	15.01.24	19.01.24
Work agreement	17.01.24	24.01.24
Project plan	15.01.24	26.01.24
Planning and research		
Create and send out survey	17.01.24	23.01.24
Survey analysis	23.01.24	25.01.24
Project planning/structuring	29.01.24	06.02.24
API Researching and Testing	05.02.24	09.02.24
Create backlog / detailed plan	07.02.24	16.02.24
Development		
POC Design	19.02.24	01.03.24
POC Development	22.02.24	22.03.24
User testing and feedback	01.04.24	03.04.24
POC Evaluation	03.04.24	05.04.24
POC Rework	08.04.24	12.04.24
User testing and feedback	15.04.24	17.04.24
POC Finalization	17.04.24	19.04.24
Evaluation and final delivery		
Evaluate results	20.04.24	22.04.24
Discuss further work	23.04.24	23.04.24
Final delivery	20.04.24	21.05.24
Final presentation (with preparations)	21.05.24	24.05.24
Main rapport	15.01.24	21.05.24

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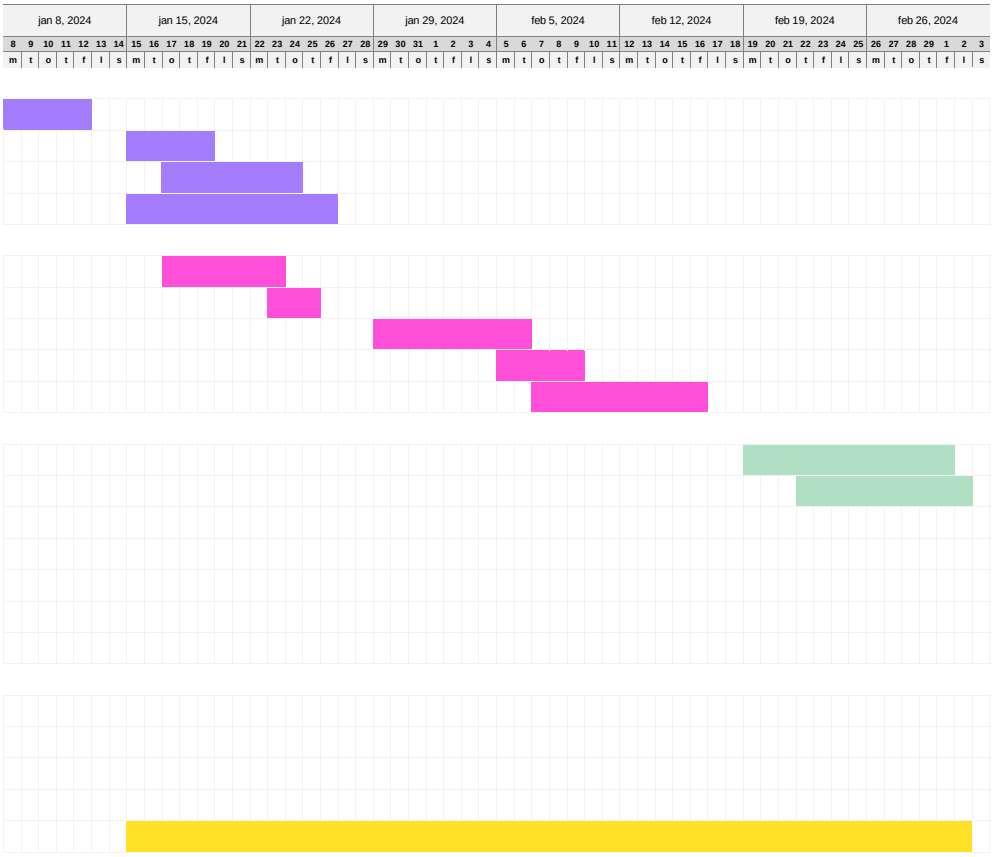

Bachelor thesis

Aleksander Olsvik, Joakim Falch and Sander Olin Johansen

Project start: **08.01.2024**

Display week: **6**

SIMPLE GANTT CHART by Vertex42.com
https://www.vertex42.com/ExcelTemplates/simple-gantt-chart.html

TASK	START	END
Starting phase		
Initial agreements and discussions	08.01.24	12.01.24
Define problem	15.01.24	19.01.24
Work agreement	17.01.24	24.01.24
Project plan	15.01.24	26.01.24
Planning and research		
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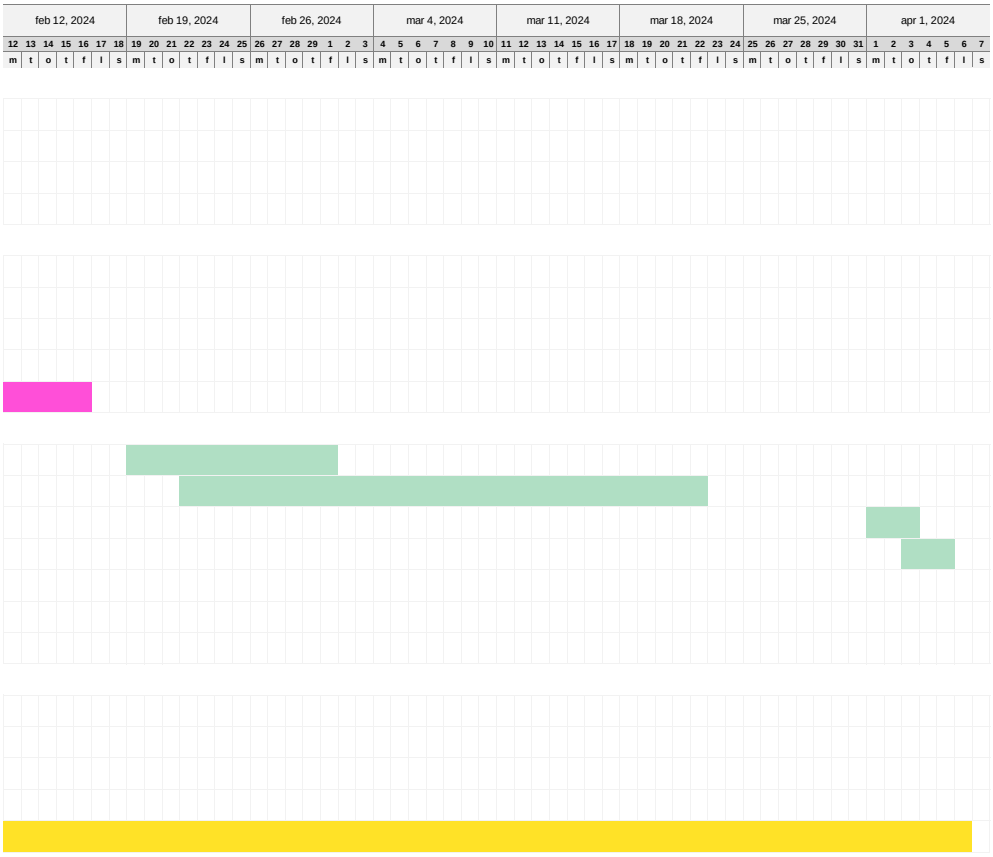

Bachelor thesis

Aleksander Olsvik, Joakim Falch and Sander Olin Johansen

Project start: **08.01.2024**

Display week: **12**

SIMPLE GANTT CHART by Vertex42.com
https://www.vertex42.com/ExcelTemplates/simple-gantt-chart.html

TASK	START	END
Starting phase		
Initial agreements and discussions	08.01.24	12.01.24
Define problem	15.01.24	19.01.24
Work agreement	17.01.24	24.01.24
Project plan	15.01.24	26.01.24
Planning and research		
Create and send out survey	17.01.24	23.01.24
Survey analysis	23.01.24	25.01.24
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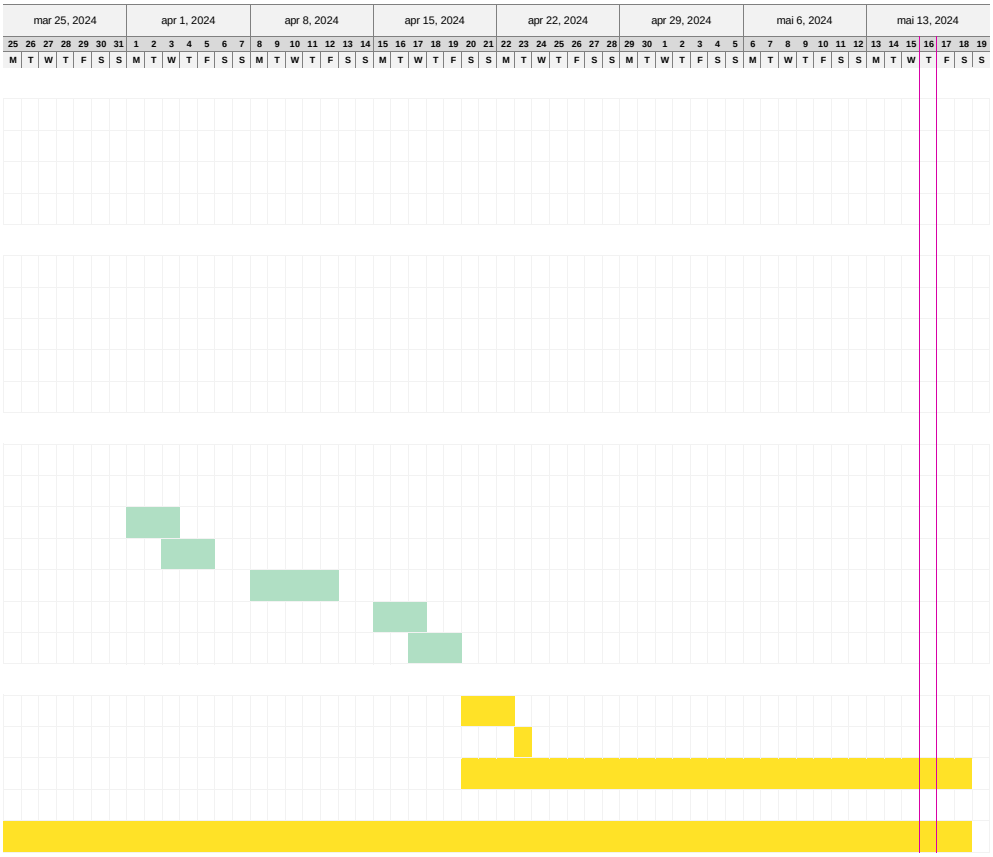
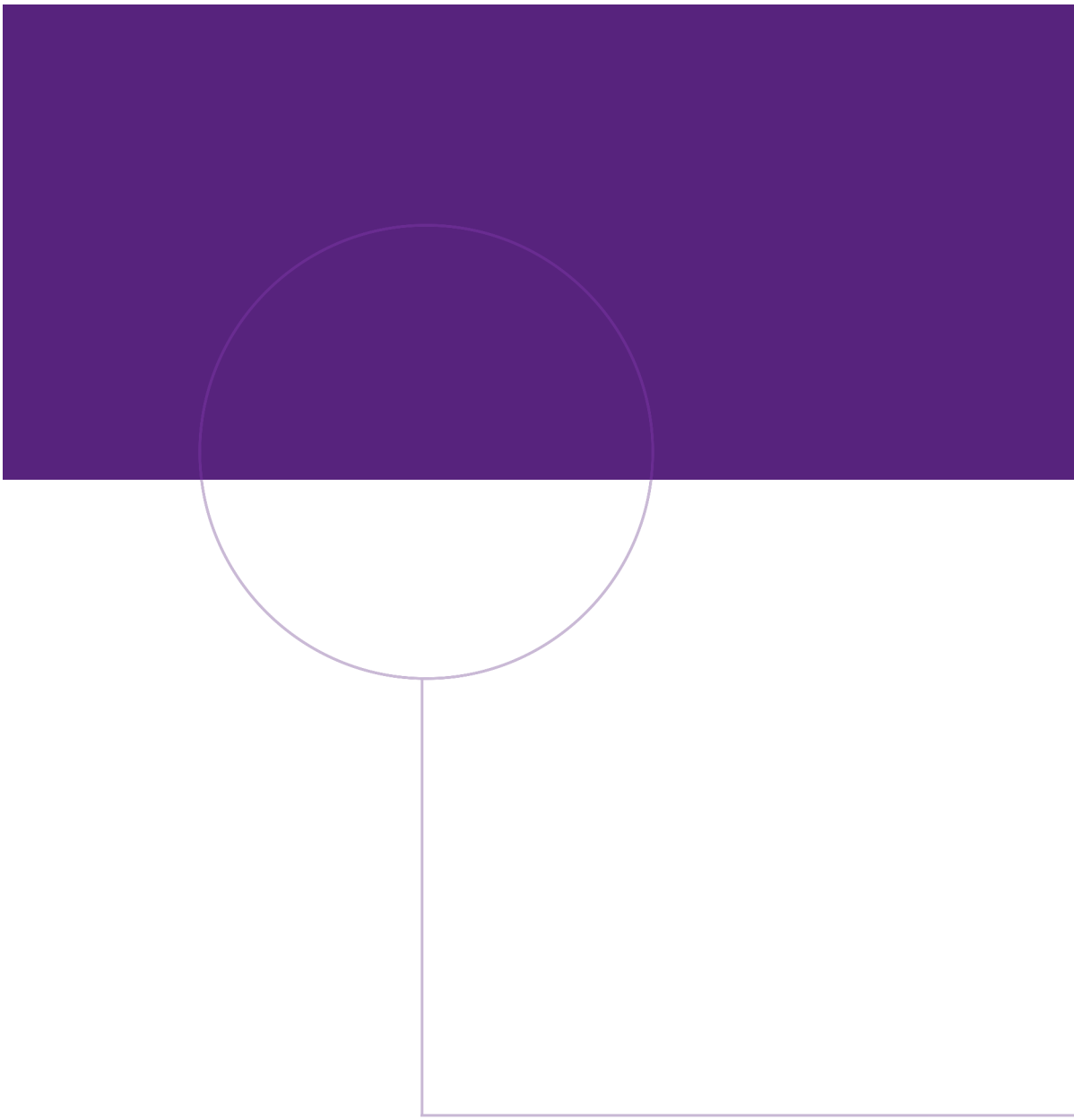
Insert new rows ABOVE this one





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Science and Technology