Reflection[1] Report for Product-Based Assignments

Mobile pain tracker app

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Group Number: 5

[1]Reflection is “the practice of periodically stepping back to ponder the meaning to self and to others in one's immediate environment about what has recently transpired” Raelin, J. A. (2001). "Public Reflection as the Basis of Learning." Management Learning **32**(1): 11–30. A reflective practitioner is a person capable of learning, acting and adapting to environments, someone who is constantly seeking to widen their experience and knowledge by adapting their manner of work in the profession. Someone who always learns through what they do, and who continually combines action with reflection on what has been done.

Table of contents

1. Introduction

The goal of this university project was to apply the project management skills learned in the course TPK 5100 to manage the processes of planning, developing, producing and finally delivering a real product.

First, we needed to come up with a product which would satisfy some end-user need, to ensure that there would be some potential market for the product. Each of us proposed possible products to be made, but one idea seemed particularly interesting: a team member that suffers from chronic headaches proposed the idea of making an application for tracking these chronic pain episodes.

The team further questioned the team member suffering from chronic headache about the current system. They found that doctors at St. Olavs Hospital treating chronic pain in Trondheim gives their patients paper forms in which they can report one chronic episode a day and note down some key info like pain levels, symptoms or used treatments. Finally, the form is submitted on a monthly basis to the relevant doctor, who then has to analyze the data. The doctor then manually fills in the information in their information system.

In general, the team member is satisfied with their doctor’s procedure, but nevertheless reported some weaknesses in the process. Foremost, it may happen that the sheets are not at hand, very often you may forget them, or you don't really have the possibility to report the data at a given time. For these reasons, there is a risk of postponing filling out the sheet and possibly forgetting to do so. Secondly, in the current system you only have the possibility of entering one episode of chronic pain per day, and this greatly reduces the completeness of the final information. Finally, it might be useful to make notes about the recorded episode, perhaps to keep track of important information, but the space constraints of the existing sheet do not allow this.

Based on these needs, we decided to create an app that could help people with chronic pain, as we found that the current way of tracking pain was not effective.
In particular, it should be easy for the user to record multiple pain events throughout the day, entering the required data for each and having the option to add comments. As for delivering a list of episodes to the doctors, the functionality to easily create a well-structured and easy-to-view PDF file was proposed. Finally, through research we realized that both the patients and doctors greatly appreciate the ability to graphically visualize pain trends over time, to identify recurring patterns and get an overall understanding of what happened in the previous days.

2. Evaluation of Project management effort

a) **Evaluation of the organization of the project group, distribution of the tasks, roles and responsibilities? What went well and what did not go so well?**

During the first cognitive meeting, we created a document containing the main skills of each team member, their interests and expectations inherent to this project. This information helped us with the assignment of tasks, roles and responsibilities.

Our roles in the team were not set in stone, and some members fluctuated between them. However, we still had three primary roles:

1) **Developer:** Three members of the group had previous software experience and were therefore assigned roles of software developer, as our project was primarily about making a software product.

2) **Designer:** One member of the group held the role of a designer (and management), using Figma to build prototypes of the app screens and understand their relations. During the programming and development phase, the designer helped the programmers complete their work.

3) **Management:** Three members of the group had mainly managerial responsibilities such as planning of the meetings, compilation of the required documents, analysis of the stakeholders involved, carrying out research and analysis of the requirements / creation of surveys to test the prototype and obtain information of interest.

The tasks were given to the most fitting member (based on role) while trying to give every member a similar workload. This allowed the project to be implemented in the most efficient way. In the end there were differences in the workload because it was hard to estimate the time needed for each task and problems which might occur in each task.

b) **Evaluate the effectiveness of the risk management plan of your project? What went well and what did not go so well?**

One risk factor seriously considered during the planning phase was to ensure acceptance by end users, i.e., patients and doctors. The team during the project managed to have some potential patients test the features and obtained positive feedback. Despite this, it failed to develop a sufficiently effective communication strategy because it did not get feedback with the survey. This could have been because of how it was distributed and the fact that the survey was distributed late in the project schedule. The risk assessment of getting acceptance from doctors was well considered, but was deprioritized as the team did not have enough resources or the right network connections to ensure strong communication and feedback from the health sector.

The next important risk was the risk of creating a product that would not comply with local regulations regarding processing private data of the patients. The team properly handled this risk by

only processing data locally and having no central unit that would store the data. It is up to the user to print out or send the information how they see fit.

A technical risk was making sure the application scales for many potential users. Due to the nature of the application requirements, this risk could be handled efficiently by having no central data processing unit. This means that horizontal scaling of the application is very simple. When it came to making sure the app works for devices the user potentially has, the team ensured this by creating the application as a Progressive Web Application (PWA). This means that the application is available as a website which can be used by any device with a modern web browser. Furthermore, the application can be installed as an "app" on most mobile devices, i.e. devices using Android and iOS.

The team has tested all functionality both on mobile devices (Android and iPhone) and desktop computers. The risk assessment was overall well-defined and well adhered to, as it made sure the team's solutions were scalable and can work for as many users as possible.

The risk of mismanaging the time was handled by making sure the product had a planned Minimum Viable Product (MVP). The planned initial version had only the basic requirements for the product to be useful, and the team asserted a deadline for the prototype to be finished. By doing so, the team could be fairly certain that a functional product would be done before the final deadline. The team ended up keeping to the MVP deadline and had additional time to iterate on the product and implement additional features.

c) Evaluate the effectiveness of the communication plan in your project? What went well and what did not go so well?

Originally, it was planned to have a physical group meeting each week at campus. The first few meetings were productive but as the project progressed it was deemed better to have smaller discussion meetings digitally as the norm. Physical meetings were reserved for bigger problems. The first meetings were productive, and the communication was intense and they were helpful as it has allowed us to obtain lots of ideas and opinions that have served us during the course of the work.

As a communication channel, we decided to use Discord, in which there was a chat related to the different aspects of the project, like "design" or "coding" and a general chat to allow cross communication. However, at many times there was a lack of communication between the various subgroups and project management would have had to work more on this aspect. Alerts from the app were easily missed or easy to ignore, leading to some important messages being read late, and some doubts remaining hidden rather than discussed.

d) **Did the group manage to deliver the project results according to the originally stated success criteria (according to your original plan)? If not, why? Is there any deviations between the stated success criteria and your final evaluation of the project? Reflect on the causes or reasons of this deviation.**

In our original plan, we listed the following criteria for establishing the success of our project:

Deadlines met: despite the high workload, we managed to implement a well-structured planning and control process; because of this, all deadlines were met.

Stakeholders satisfaction: project management failed to manage the collection of feedback through the survey. In addition, we still do not know whether doctors would appreciate the functionality of the app because we have not had a chance to meet with them. Despite this, end users who tested the product reported interesting feedback and were satisfied.

Good working environment: the work environment, during the in-person meetings, was peaceful and engaging since there was active participation by everyone. Each of us felt free to present our opinions and share our ideas/suggestions. Although we were all very busy with our own university courses, we still managed to have a good experience.

Learning experience: we can say that the project has posed numerous challenges to face, thanks to which each of us has managed to bring home new knowledge and experiences. As this is a university course, the knowledge gained at the end is definitely a key element, so we are satisfied with what we have learned and hope to be able to reapply these skills in the future.

Deliver a usable app with pain tracking features: we wanted to have an actual usable and useful app at the end of our project. We managed to deliver on our goal and the app is publicly available and it works correctly.

Overall we have good feelings about the finished product, therefore the project management was not a complete failure. Because we were not able to get a sufficient amount of feedback from our end users we can not talk about a full project management success.

Please evaluate the degree of your support to the following statement (group-based evaluation):

We evaluate our project management effort as successful:

Scale	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Your response			✓		

3. Evaluation of the impact

a) **Who is the target audience of your product? (target audience could be individuals, groups or organizations that could benefit from the results of your work)**

The target audience of our product are people suffering from chronic pain episodes, a pain that can last over long time periods, for some months or even years, making it difficult for those who suffer from it to carry out daily activities. More specifically, the app was developed to replace the current method of collecting data relating to chronic events that patients at St. Olavs Hospital in Trondheim have to follow.

The app could also be of interest to doctors who prescribe treatments for these patients, since the reports containing the histories of chronic episodes must reach them. In the pre-report, doctors were identified as stakeholders with a critical influence, which could theoretically block the app by not accepting the collected data. In a preemptive attempt to reduce the odds of this and reduce their influence, an export feature was developed, which generates a form sheet similar to the current one.

b) **How do you evaluate the quality of your final product? What evidence do you have to support your evaluation? Evidence could include: feedback from your target audience, end-users, other informants, results from tests or surveys you have conducted, statements from other individuals who have tested your product.**

During the project, the team approached two people as key end-user representatives, as the goal of the product was to serve as a useful substitute for a chronic pain monitoring module. To verify that the product has the expected quality, the team ensured iterative feedback from key end-user representatives during product development. During meetings with these potential users, they were shown the main features of the application and given the opportunity to test them. By maintaining close communication with the main end-user representatives, the team believes that adequate quality assurance was maintained and that their feedback serves as sufficient indicator that the product works as intended and as expected by the potential users.

Statements:

I appreciate being able to visualize the trend in pain levels over time. I used the "Migraine Buddy" app to report my headache episodes and did not have that option.

Davide, end user.

To get further evidence that the quality of the product is good, the team created a survey containing several sections.
The main information we wanted to glean from the survey was:

- usefulness of the app
- similar apps previously/currently used
- features most appreciated by the apps already used
- comments regarding app layout and ease of use
- suggestions for possible improvements.

Although the survey was also translated into Norwegian to increase the likelihood of engaging the audience, we were unable to get any feedback. There probably should have been more work done to ensure effective distribution. In the planning and risk management process, it would have been useful to take into account the risk of not finding enough users who would agree to participate in the testing phases of the product, since the app specifically targets people with chronic pain.

However, the feedback from our main end user was very positive and can be considered evidence to support the good quality of the product, but it should have been supported by a more quantitative analysis of product usage.

Please evaluate the degree of your support to the following statement (group-based evaluation):

We evaluate the quality of our final results as outstanding:

Scale	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Your response				✓	

4. Factors that have contributed to failure/success.

Which factors were the most significant and why?

Success:

- Realistic Time scheduling based on the needed tasks

  Without the accurate estimates proposed by the developers, the team would have risked not finishing within the deadlines.
- Motivation & Commitment of project team

  The team's motivation made it possible to overcome periods of maximum workload.
- Realistic early project planning and task distribution
- Knowledge/Experience of the used technology

  Prior knowledge enabled us to build a working app that met all expectations in a short time.
- Flexibility and adaptability

  adaptability allowed us to implement requested changes without exceeding deadlines.
- Balanced team skills (half development, half management).
- Clearly formulated objectives and requirements of the product

  Because of this clarity, we were able to define the tasks to be performed and measure deviations from what was required.
- Kept up with proposed milestones schedule

  This factor helped keep team morale and motivation high.
- Using general software development practices to reduce the time overhead and the risks
  - Version Control System, Linting, Ticket system, Agile techniques.

Failure:

- Communication problems
  - Internal
  - Hardly any external communication

  these shortcomings have generated moments of indecision and suboptimal work management.
- Poor end user interaction outside of the project group during the testing phase.
- Lacking experience in project management before starting the project

  lack of experience caused failure in managing some aspects such as communication and coordination among subgroups.
- Fluctuating team morale.

- The project group consisted of students, and not full time workers
  resulted in having a hard time to schedule meetings.

Comparing the success factors we identified with the factors listed in (Hussein 2018) pp-92, we can draw the following conclusions:

On one hand, there are concepts present in both lists, in fact we believe the success of this project was mainly due to proper initial planning accompanied by a careful division of responsibilities. The experience of the developers allowed us to make accurate estimates of the time required to complete the various components of the app, and this helped us to address risks and deliver all work within the deadlines. In addition, the initial meetings allowed us to share a lot of information and thus have clear goals and purposes for everyone. Finally, during the development of the app's features, there was a strong motivation on the part of the developers who collaborated strongly to accomplish the assigned tasks and to be able to make changes in a very short time based on feedback and group discussions. We see this aspect, relating to agility and adaptability, as another positive factor.

On the other hand, there are success factors listed in the course book which we did not satisfy, which for some cases then ended up being failure factors. Among those listed in (Hussein 2018) pp-92 we could identify proximity to end customers and collaboration with stakeholders as a factor which could have helped with success, but since we were not in an environment where our end users were easily found it became a failure factor instead. We could have done a more thorough research to look for more potential users of the app and thus receive more opinions and different points of view. In addition, project management experience also cannot be reported among the success factors since the lack of this element made it very difficult for students with this responsibility to ensure a good flow of information and constant involvement of everyone.

It should be mentioned that the success factors in the book are collected from different sources including scientific papers and projects and listed in the most generic way possible. However, each project is different therefore not all factors are applicable to all projects.

5. Most important lessons from your project

A) Based on your collective experience as a group and you were to give unambiguous advice to other students on how they should work on similar projects what you would say to them?

1) During the initial phase of the project, when the team must choose which product to develop, it is important to guide the choice by considering two main aspects:
   - To identify promising ideas, the initial brainstorming phase must be constructive so each student must be encouraged to be creative without placing too many constraints/judgments. It could be helpful to gather the group members interests, motivations and skills before starting the search for the idea.
   - The final product must represent a challenging goal that allows all team members to learn something new and put their skills to the best possible use. Encountered problems are a great way for the team to improve their constructive thinking and the ability to find creative solutions. However, it's important to keep in mind not to overextend the project scope, because you have limited time and resources. Make a priority list of features which are crucial to implement and which options that can be optional and only added if time allows.

2) Our advice is to early in the project lifetime, make an effort to plan and split the project into smaller tasks in the best possible way. Clearly, it is not easy to carry out a very detailed plan because you might not have a lot of information at your disposal, and you can't predict all types of problems that might occur. But having a clear view of the skills needed for each task, defining the roles appropriately, establishing communication channels, and defining a clear structure, like a WBS, certainly helps.
3) We learned that communicating about how the project was progressing regularly is useful for keeping up with the overall progress of the project. But it is also important to try to only involve the needed people if problems arise, as not everyone might be relevant for solving the problem. If you are not able to solve it "locally", then the solution might be to increase the number of involved people. This allows you to use time efficiently and reach good solutions quickly without interrupting everyone's work.
4) Our experience from the project suggests that starting early is very important, as it gives more time to adapt if complications occur. In addition, it is very important to be able to assign tasks to team members in a balanced way so that everyone can dedicate an adequate number of hours to the project. This aspect greatly affects everyone's morale and motivation, therefore greatly influences the success of the entire project.

6. Reflection on learning and unlearning

1) **What did you need to learn** (acquire or gain knowledge, insights or ideas) so that you can handle the emergent needs and challenges of your project?

Working with new systems and technologies meant that we all got new knowledge depending on our background. However, we would like to focus on the general aspects of the development game:

- The importance of carefully planning the tasks to be carried out and assigning them fairly, making sure that there are no team members who are too stressed while others aren't at all. The workload required by the developers was very high, and in some moments it was necessary to learn how to rebalance task assignments.

- The students, who held the managerial position, did not have high IT skills since they came from a different educational background than developers. This made it clear that it is very important for project management to have adequate knowledge of the business domain of the project that they have to manage, because otherwise there would be too much distancing between the departments. That could cause misunderstandings and reduce collaboration. These students had to learn some of the main activities of app development processes so that they could communicate better with the developers.

- Project management must ensure that the flow of information is constant and that emerging problems are resolved. Moments of silence can lead to misunderstandings and therefore problems could cause discontent of members and delays in deliveries.

- A surprisingly important ability was understanding when it was a good time to ask for support and especially understanding who needed to be involved so that decisions could be made faster and of higher quality.

Can you describe or reflect on situations where learning was critical to the success of your project?

- A team member who was in charge of the planning and control learned some programming techniques at a time when the workload of the developers was the highest. With this move, he was able to improve the link between management and development. He had gone into the details of the app development and at the same time facilitated a rebalancing of the workload.

- Recognizing the time when communication declines is easy, but talking about it is difficult. Nevertheless, we came up with the idea that everyone should write on shared documents their personal opinion on the continuation of activities and the current state, and this brought out the fact that we needed to raise the levels of motivation and communication. It was very helpful.

2) What did **you need to unlearn** (discard beliefs, practices or knowledge that no longer was helpful or outdated or wrong) in order to handle the emergent issues/problems/challenges during the project?

- The team thought it was enough to have the information obtained by interviewing end users (either through interviews or surveys) to make a valuable product. During the project, we realized that conducting research and comparing our product against similar products offered in the market helps to get interesting insights and understand useful features that perhaps the interviewed customer is not aware of.
- The team thought a weekly team meeting would be a good system to keep up with the progress of the different parts of the project, but found that in many situations, small updates through online communication were sufficient.
- The team needed to unlearn that the only way of distributing a mobile application is true native applications published on an official app store.

Can you describe or reflect on situations where unlearning was critical for the success of your project?

- Although physical meetings were useful for being productive and to ensure good communication, at times of high project workloads, it was helpful to replace the in-person meeting with quick updates on Discord. If we had not done so, we probably would not have used the time optimally and the developers would have been more stressed.
- During planning of technology that would have been used for creating the app, the team thought it would have been necessary to put the application to official app stores to ensure its distribution. After a research of PWA technology, the team instead found that the application could be served as a normal web-site that could be downloaded as an application instead, while still fulfilling the distribution requirement. The simplification saved the team a lot of time, as uploading to official stores can be a huge hassle, as well as making the process of updating the application a lot slower.

7. Acknowledgments

In this section we want to thank our non-project team colleagues for testing the application because their input showed us how a new user would interact with the application.

We are very grateful to our lecturer Bassam Hussein, for being helpful and available for questions if we had any.

We also want to mention the support of the teaching team and our colleagues for distributing our survey.

8. References

Please use (Author-date) style when you writing your references as follows:

Hussein, B. (2018). The Road to Success: Narratives and Insights from Real-Life Projects, Fagbokforlaget.

9. Appendix

Appendix 1

Link to our app: kvide.eu

(This app can be opened in every browser but it is designed for a smartphone browser.)

Appendix 2

Link to our video presentation: youtu.be/rUVg5WU-E84

Appendix 3

Our pre-report: attached in the following pages

Pre-report project assignment (TPK5100)

Group 5: Sindre Vie Jørgensen, Marek Lukas, Håvard Stavnås Markhus, Maximilian Ogris, Natalie Short Olsen, Francesco Giliberto.

Type of product:

A digitized tracking app for tracking chronic pain (the name is yet to be decided).

Expected benefits of the project:

This project aims to simplify the data collection process carried out by chronic pain patients in Trondheim.
This process aims to help people in Trondheim who suffer from chronic pain to carry out the process of collecting data when they experience “episodes”. Where “episodes” are instances where the chronic pain rises in intensity or changes behavior from normal.

Until now, patients had to enter data on chronic episodes on sheets of paper, indicating the start time of the episode, the level of pain, the treatment used to deal with the pain, and at the end the duration of the episode and the level of usefulness of the treatment. However, these people perceive this mode of data collection as inefficient because in many situations there is a risk of not having the sheet available or not being able to fill it out at that particular time. In addition, the data collection tables are designed in such a way that for each day, it is only possible to enter information concerning one chronic episode (due to the space available on the sheet), so there is a loss of information. Finally, the doctor, once he has received the sheets, has to upload the data onto the IT system and proceed with the analysis. With this project we would like to solve these needs by digitizing this process. The app will allow the patient to easily enter data whenever the need arises and increase the amount and quality of information.

- Simplify the process of tracking pain and analyzing the data

- Sharing the data with the relevant health professionals (Export data functionality)
- Ability to add custom treatments and symptoms (adaptability)
- Possibility of keeping track of multiple episodes during a day
- Possibility of including more information about a pain episode, overcoming the space constraints of paper sheets

Potential stakeholders and plan to involve these stakeholders during the project development:

We carried out an analysis to understand the organization of the Norwegian health care system, in particular the care of chronic pain patients. This research enabled us to identify the main stakeholders involved in this project and classify them along two different axes:

1) Influence, which concerns the stakeholders without whom we are not able to get our project right. They influence the project through their ability to approve or disapprove
2) Interest, there are stakeholders who may not have strong influences on the project, however, they may have high interest and therefore will be affected by the results obtained

Identification of the stakeholders:

- Chronic pain patients (end users)
- Doctors of the chronic pain department (need to work with the output - can decline the app)
- St Olav's Hospital management (need to work with the output)
- Regional health authorities
- Private doctors (Interest would depend on state of the project, the “idea” of the app might not be enough to gain their interest, but a working prototype which they could implement in their practice may gain their interest)
- Head of the chronic pain department (hospital of Trondheim)
- NTNU
- Patients' families
- Norwegian Data Protection Authority

STAKEHOLDERS MAPPING:

Stakeholders classification		Interest	
		small	large
Influence	critical	● St Olav's Hospital management ● Doctors of the chronic pain department not interested ● NTNU ● Norwegian Data Protection Authority	● Doctors of the chronic pain department interested ● Chronic pain patients (end users)
	marginal	● Private doctors ● Regional health authorities ● Head of the chronic pain department	● Patients families

Implementation of the appropriate strategy for each stakeholder's category:

1. Stakeholders who have critical influence and a lot of concerns. This group is critical because if we will not be able to satisfy their interests we will not be able to proceed. The doctors of the chronic pain department (interested) could approve or disapprove this type of project, especially since it requires them to accept the output of the application. In addition, patients might also refuse to use an application, especially if they lack computer skills. If the change is not introduced gradually and with a defined plan, there is a high risk that these stakeholders will not be supportive or even try to sabotage the project. The strategy we intend to adopt is to collaborate with these people and listen to them to understand what are the main needs that need to be addressed and then

to make them participate in the decision-making/implementation of the project.

2. Stakeholders who have critical influence but small interest. This category includes important bodies and authorities that cannot be overlooked. It is necessary to satisfy them, whatever concern they have. The Norwegian Data Protection Authority and St Olav's Hospital board have many other projects to think about therefore interest in this particular work is low. Nevertheless, they have a lot of power and can decide that the app will not be used.

3. Stakeholders who have marginal influence but large interest. This group could include patients' families because they are interested in their health and want to be sure that these changes will not bring problems/mistakes in functioning. For example, the son of an elderly person wants to be reassured that this new application is easy for anyone to use and that there is no risk of patients becoming confused with the available features and making serious mistakes. If they request information it is good to keep them updated, even if there will be little support from them.

4. The last group is stakeholders with marginal influence and small interest. The high-level health authorities and private doctors are all categories that have low interest in this project because they are busy with other matters and the success of the project is not strictly dependent on them. However, these stakeholders are to be kept an eye on because they might change their positions and strongly influence the outcome of the whole work. For example, if there was a problem regarding the security of patient information, it could happen that the high-level health authorities would act and the information would spread through the media as well.

A project risk assessment plan, indicating the main risks and how are you going to address these risks:

This project aims to create a concrete product that is a smartphone app that can help people when collecting data regarding chronic pain episodes. Nevertheless, the result of the work will also introduce a change in the way, how this activity was done, and this change may or may not be accepted by end users (patients) and doctors. This is a risk factor, in fact we need to make sure that there is a thorough requirements collection plan so as to understand people's needs well and resolve any concerns they may have. It is therefore an iterative process during which we create prototypes of the application and test the results with potential users and collect feedback, so as to minimize the risk of misunderstanding and discontent. Stakeholder analysis helped us identify strict constraints that must be kept in mind during product development. For example, another risk factor relates to creating a product that does not comply with regulations related to the processing of patient health data, as this is sensitive data. Therefore, it is our job to seek all the necessary information to avoid discovering at the end of the project that the application is not in compliance (this fact could change the position of stakeholders in the map, generating serious problems). The team will try to keep as much as possible of the data locally with the client, such that the least amount of data about the patient leaves their control. Most of the information can be stored locally on any user's device and does not have to leave it to still have a functional product.

In addition, there are technical risks to pay attention to, such as the fact that the app must be able to be downloaded in any type of smartphone and that it must be compatible with the health IT system. To make sure the application is usable on any platform, the application is planned to be implemented as a Progressive Web Application (PWA), meaning the application can be used in any browser, as well as being used and downloaded as a dedicated mobile application for android, iOS, or desktop system.

Finally, the level of uncertainty is quite high since none of us have worked on a similar project in the past so there is a risk of making a wrong estimate of the time needed to finish the work, thus not finishing within the deadlines. Our

approach to deal with this risk is working with proven project management practices for software projects, thus we decided to initially implement the features deemed necessary and iteratively add additional features so as to make more predictable and accurate execution time estimates.

What skills do you need to acquire in order to produce your product? How will you acquire these skills?

To create the product, the needed skills would be:

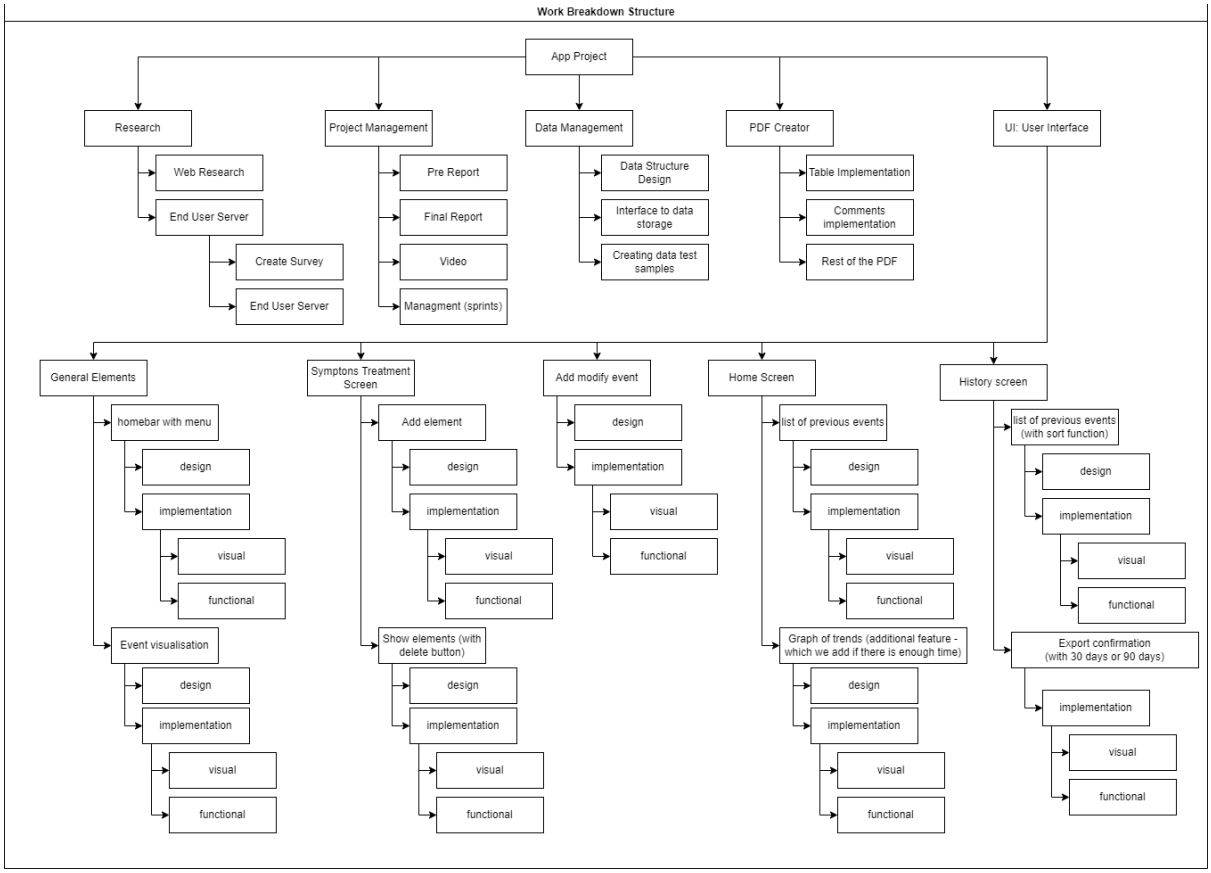
- Product requirement research
- Graphic / UI-Design
- Software engineering
- Project management

For finding out what the user needs from the application specifically, we would need someone that can communicate with users of current non-digital medical form and understand their needs. Users of current non-digital pain trackers would provide us with information by filling out a survey form (to collect their answers to a few questions). Together with the team, the requirements and features of the application could be improved and adapted.
To translate the user requirements and features needed of the digital version into a visual user experience, we need design skills.
To actually build and manage the application, we need software engineering skills.
Project management skills will be needed to be able to organize the tasks to be performed, assign responsibilities, monitor the progress of the work, and manage the communication and motivation of the team.

Project breakdown structure indicating the major deliverables, sub-deliverables and work packages:

In the last two meetings, sketches of the user interface were drawn to discuss the different functions the app will provide. These single user-interface views were a good way to start designing the breakdown structure of the application. With that, a few of the highest packages for the work breakdown structure (WBS) were found. Additionally, other important tasks such as research, project management, as well as data management and PDF generation, were added. The PDF will contain a large table with the for an event normal data and a comment field. The user is able to add a comment, which will be located at the end (in its own list with the date of the corresponding event) of the PDF identifiable with a number.

In the event of a full reduction of scope to the bare minimum, then the needs of the app would be a way to log “episodes” of chronic pain and a way to show this data to a doctor.



Project schedule. Produce a time-estimate of each task (build and produce) in the project:

Before going into the time-estimate of each task, a short overview of the general process is given.

The decision was made to use a classic software specific iterativ process. All tasks (currently in the WBS) will be added to github. At the beginning of every sprint, all developers will decide together which tasks shall be included in this sprint. Then everyone takes his part and develops on a different branch (a feature of the software version control system git, which allows efficient cooperation in larger projects, while every developer operates on a small part, these parts can be merged at any given time). The project can be considered finished once all tickets (tasks in software slang) are closed (completed).

Define “n” as a basis unit of time, meaning 2n is twice the amount of time needed for a workslot than n. (This is a common practice in software

development projects - to plan the sprints). In software development, problems occur without a determinable scheme. Therefore an n can between 30 minutes and 2 hours, depending on how manch experience you have and how time is spending to find the last error *.
The following table contains all time estimates of all tasks sorted in their individual parts of the WBS.

Research (16n) Web research End user survey (8n) create survey (2n) analyze the data (6n)	Project management (10n) Pre Report - done Final report Video (2n) management (sprints) (8n)
Data management (5n) Data Structure design (1n) Interface to data storage (3n) Creating data test samples (1n)	PDF creator (8n) Table Implementation (6n) Comments Implementation (2n) rest of PDF (2n)
homebar with menu (5n) design (1n) implementation (4n) visual (3n) function (1n)	Event visualization (12n) design (3n) implementation (9n) visual (8n) function (1n)
Add/modify event (12n) design (1n) implementation (11n) visual (8n) function (3n)	list previous events (7n) design (1n) implementation (6n) visual (4n) function (2n)
Graph of trends (additional feature - which we add if there is enough time) (5n) visual (2n) implementation (3n)	History with sort function (3n) design (1n) implementation visual (1n) function (1n) Export confirmation (last 30 days, last 90 days) (2n)
Symptoms/Treatments Screens (11n) Add symptom/treatment (5n) design (1n) implementation visual (2n) function (2n) List of treatments (6n) design (1n) implementation visual (4n)	Languages / Accessibility options English (base language- Required) Norwegian (If time allows it)

function (1n)	

Proposed time schedule:
prototype design deadline: 8.10.22
prototype deadline: 15.10.22
2nd prototype design deadline: 18.10.22
2nd prototype deadline: 22.10.22
Planned finished product: 29.10.22
Write project report: 30.10-2.11
Final deliverables: 3.11.22
-Finished product deadline: 3.11.22
-Final project report with evaluation and reflection: 3.11.22
-Video presentation deadline: 3.11.22

A list of the most important success factors that you should adhere to in order to succeed in the project:

- Competent engineering team

To successfully be able to build a good product, the software engineering team have to
be affordable and competent. They should be able to build based on the needed requirements and do it for an affordable price.

- Effective communication

Effective communication between project manager, end-users and engineering team.
The project has to be successfully funded or supported.

- Satisfy stakeholders

The stakeholders have to be satisfied with the product, especially the end users.

- Deadlines met

The project has a strict timeline, as it has a final delivery date. Keeping to the intermediate
deadlines are necessary for overall managing to meet the requirements in time.

- Learning experience

It is important to ensure that all team members have learned new helping skills for future projects and have completed the project satisfied.

Roles and responsibilities in the project:

The group was split into two parts with 4 people in development and 2 in research and UI design.

Git-Master

Responsible for merging the branches and maintaining the repository.

Documentation

Responsible for the reports.

Management

Making sure deadlines are met, maintaining communication, showing initiative to work on the project, scheduling meetings, reserving meeting rooms.

Research

Searches the market for alternative products. Compiles down the high level problematics of the project goals. Investigates what the client actually wants through interviews and surveys. Inquires about the main constraints to be taken into consideration.

UI Design

Is responsible for coming up with a user-friendly user interface for the product.

Coders

Is responsible for creating the deliverable product (the app) itself.

Communication plan:

- real-world meeting once a week (if possible)
- continuous online communication via Discord (voice chat, written chat)
- technical related communication via GitHub
    - features
    - bugs
    - actual code
    - milestones
    - tickets (and with tickets sprints)
- design-related communication via figma
    - still working with git ticket system as our main management tool