Reflection Report for Product-Based Assignments

Budget application for students

Group 16

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1. Introduction

The project assignment was to plan, develop and produce a product. The project for this specific assignment was a budget app. The main criteria for the produced product was to create value for the end users, being students. The purpose of this app is to help students get a better overview of their budget and provide better control over their own money. The user will be able to insert how much money they have per month, and how they would like to divide it between different categories. It will also be possible to register each expense under the different categories.

The expected benefits from the product is to get a good overview of your expenses and income, and better control over your personal finances. This is important, considering the purchasing power of students has decreased almost linearly since the 90s (Aftenposten, 2022). A budget is constructed to have control over where all your money is going. This app will give you a good overview of all your main expenses and incomes. It will be possible to personalize the categories and add incomes, depending on your needs. When it comes to controlling your finances, which for the average student is often considered demanding, usability is important. The app should be easy to set up, intuitive and fun to use. By being able to register your expenses and income, it can be thrilling to follow your expenses throughout the month. Will you be able to save some money or do you have to limit your spendings? Then you gain better control over your personal finances, while hopefully having some fun!

2. Evaluation of Project management effort

2.1 Organization of the project group

The project had two major tasks, the first to develop the app and the second to write the report and make a video presentation. Following an organizational structure, the major tasks became the two departments in the functional structure. Being that there were limited individuals with high expertise on developing an app, the major responsibilities of actually making the deliverable was mostly on one person. The remaining group members got the major responsibility of the written report and weekly assignments. This division worked well and suited the knowledge situation. The

app leader did not work completely alone, as there were two other group members who had the responsibility of making a survey. The survey was an important factor to communicate with the end users during the development of the app. This worked well and the app developer was able to direct all focus on the coding itself, while getting input from the end users. The group also conducted a design workshop, where everyone contributed to find a common understanding on the design of the app, while taking into account the end users feedback.

When beginning to write the final report, the group faced some organizational issues. There was a misunderstanding of the agreements made right at the start of the project. These were regarding the app developer's contributions to the final report, in regards to him/her doing all the coding. This did not delay the project process in any way, but it can be looked back on as one issue that could be handled better throughout the project.

2.2 Effectiveness of risk management plan

The risk management plan is presented in the pre report and should be used throughout the whole life cycle of the product. It should be the first thing to evaluate at every meeting during the project. In an effective risk plan the visualization should be good and easy to follow.

There were 6 risk factors identified, which is a considerably low number. Looking back, there were only identified risk factors during the app development and project phase, not factors that can arise after the app is finished and available for the end users. One example here could be that no one uses the app. Considering the risk assessment was conducted in the beginning of the project, the syllabus on risk assessment was not yet lectured about. Therefore, the low number can be overlooked and the identification process is overall something that went adequate.

The process of identifying the risk factors went adequate, but the total structure and the visualization of the plan could have been more specified. The group found it hard to categorize factors by severity. This could be fixed by structuring them in a diagram rather than writing them. Therefore, the set up and presentation of the risk assessment plan did not go as well, but the group managed to cover all the important aspects of conducting a risk assessment plan and got a deeper insight during the process.

2.3 Effectiveness of communication plan

A communication plan is needed in order to ensure satisfaction of the stakeholders identified. The group established a well organized and structured communication plan and a table to visualize it.

There were some deviations with the plan which changed the communication goals. One deviation was that the showcase of the app did not get conducted two times, as stated in the communication plan. However, it was decided to have a survey to get feedback from the end user before starting the development of the app. The app was developed based on the first survey, following a showcase of the app with a second survey.

Another deviation was how the showcase of the app was performed. The showcase was planned as an in-person meeting, but due to busy schedules it was hard to find a suitable time for everyone. The showcase was instead performed digitally.

It could be argued that a more thorough work on the communication plan, could have led to avoidance of these deviations. Regardless of the deviations mentioned, the weekly meetings were considered a success and the rest of the plan was followed. Therefore, the overall evaluation is that the communication has been good and effective.

2.4 Project results according to success criteria

The originally stated success criteria were summarized into three points: time frame, value for end users and effective communication. The group managed to deliver on the first two criteria and partly on the last one.

The short time frame for this project made following the deadline the most critical criteria to maintain. A school related project which does not reach the submission deadline would directly be considered a failure. Therefore, it was important for the group to establish a schedule, that also got updated along the way, for making sure to reach the deadline. By doing this the group managed to deliver according to this criteria. The schedule did not include the written final report. This is because developing the deliverable came with the highest uncertainty and therefore got prioritized. This could have been implemented to make the schedule more complementary.

Another success criteria is the value of the product, which is a major contribution when deciding if the project was a success. Value is a challenge to measure and a highly subjective matter. The evaluation of value is based on the conducted survey, see chapter X for the results. There were only 15 people taking the survey, which might have led to biased results. The results showed that 73% of these students considered the product to have achieved its intended values.

Lastly, an important success criteria is internal communication with the group. A group chat on Messenger was created to help with the communication around scheduling meetings, delegating assignments and updates when someone was obstructed to meet. As mentioned in the beginning, a misunderstanding about delegation of the tasks arose. This resulted in obscurity later in the project about who is contributing on what. This could have been avoided if the agreement on the different tasks was better specified in the beginning and also made in writing. Therefore, the group managed to partly deliver on this criteria.

The group evaluates project management effort as successful:

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

3. Evaluation of the impact (Project success)

3.1 Target audience

The target audience for the budget application are the students. Students can use the application to get a better control over their personal finances, including an overview of what their expenses and incomes are. A new survey shows that more than half of the students in Norway are unable to live on the student grant (VG, 2021). Due to this, many students need to have an extra job next to their studies. However, for those who do not have an extra job it is important for them to have control over their monthly budget. This application will especially benefit those students, helping them stay within their planned budget every month.

Ideally, the application was supposed to list the most common expenses tailored to the average student. However, the group chose to move away from this idea because there are so many different expenses. Instead of a list with expenses to choose from, the user can insert customized expenses for themselves. This way the budget app will become more personalized for each student. This also opens up for other audiences to use the application.

3.2 Quality of final product

When creating a new app for a specific target group, it was important to interact with this group during the life cycle of the product. Therefore, it was decided to create one survey prior to the production of the app and one feedback survey after testing the app.

With these surveys, the target group would be able to express their expectations in terms of characteristics, functional requirements, capacities and operational requirements when it comes to the app.

3.2.1 First survey - pre project development

The first survey (see appendix 4) included questions about whether the students have a need for this type of budget, certain specifications they want the budget to include and how they think they can benefit from this type of budget.

The survey showed that almost none of the students use a budget, and 9 out of 15 go in a deficit each month. This backs up our theory for a need for a budget.

When it was asked about characteristics and functions of the app, the most important was that it has to be very low effort, “plug and play”. Some wanted functions were:

- A category list where you could easily pick out your most common expenses and plot in.
- Include a limit for what you are allowed to use on food, clothes, fun etc.
- Include colors in the design.

The answers from the survey were taken into consideration when deciding the design and structure of the app. In this way, the final product would include features and functions that are specified by the target group so that they are able to use the product and that the product will fulfill its main purpose. The survey was shared with 15 students in school.

3.2.2 Second survey - testing

After the app was developed, the group sent it out for testing. The app was tested on the same group of students that answered the first survey. Along with the testing of the app we sent a second survey with three questions (see appendix 4). This was to receive feedback on how the app was working for the end user, if it fulfilled its product value and additional feedback on how we could further improve the app in the future.

To evaluate the impact of the final product the group has collected feedback from the students as a measure for the application's significance. The product was tested by 15 students and they were asked to provide feedback on the three given questions.

Usability

Out of 15 students, 53% thought the app was easy to use, 20% understood some of the functions and 27% said it was too complicated. This shows that on some level we succeeded with the app being easy to understand and easy to use.

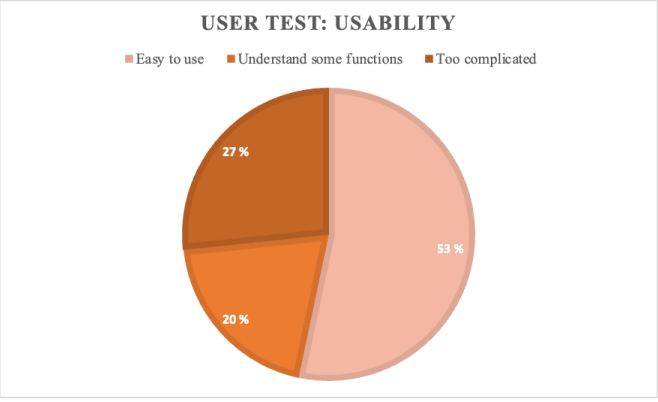

Figure 1: Usability test results.

Product value

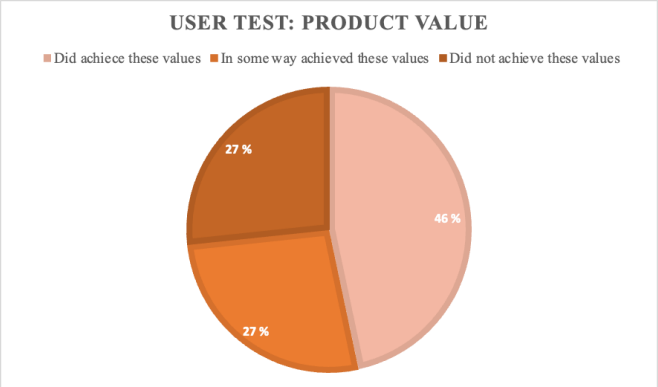

Figure 2: Product value test results.

On the second question in the survey, the students were asked whether the app met its product values. The product values for this app was to contribute to a good overview of expenses and income and help with gaining better control over your personal finances. To ensure the product values were met, the students must feel like it meets some of their requirements and that it fulfills their expectations of a budget. 46% answered that the app did achieve these values, and 27% answered that the app did in some way achieved these values. Overall, this makes 73% of the students satisfied.

3.3 Feedback for improvements

The group also inquired the end users for any suggestions for improvement on the app. The following features/functions were suggested:

- A help button to give guidance on how to navigate the app.
- Add the date on the paid bills to see what you used money on at what time.
- Make the columns red if you have passed your budget.
- Be able to look at your past budgets.
- Pick from categories that are already there.

If we were to move further on the app, these would be factors we would take into consideration.

We evaluate the quality of our final results as outstanding:

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

4. Factors that have contributed to project success

As stated by Hussein (2017, p. 50), “the notion of success is among a few topics in the field of project management that are frequently discussed and yet rarely agreed upon”, where the topics in question are how success is to be evaluated, and which factors contributed the most.

To help answer the first question, the success could be considered objectively through the three predefined success criteria as mentioned in section 2d), where it was argued that the group succeeded on two of the criteria (time and value) and partly on the third (communication). One could argue that there are better alternatives for a budgeting app, and thus not being valuable for our users. If you account for the scope of the project, plan for additional implementations and that 73% of the survey takers thought the product to be valuable, the group consider the project a success.

This objective approach is however generally less preferred than a more subjective or negotiable process, especially for this project were depending on the success criteria set in the pre-report would make a bad representation of the overall project success.

In order to better evaluate the success, it is further specified into three areas: project management-, process-, and project success (Hussein, 2017, p. 52). Considering the project management success parameters such as being on time, delivering the product according to the specifications, or complying with external and internal constraints and requirements, the group succeeds in most regards. Especially by allocating the people with the appropriate skills to the correct job, for example with the developer of the app. This could be a substantial risk factor as well, but the group reduced this risk by having two members working as intermediate between the developer and the rest of the group by collecting user feedback. The lack of challenges related to project management success were most likely avoided due to early start, good communication, effective decision making.

It is important to consider the angle of process success as well, as a project can still be a failure even though it is considered a success from the project management point of view. A typical reason for process failure could be when key stakeholders do not *feel* like being heard in decisions that affect them (Hussein, 2017, p. 52). Even though the group had some disagreement as mentioned in “organization of the project group”, the overall process success was considered satisfactory and

the group members felt both heard, seen, and given the room to present ideas. The initial problems were primarily caused by misunderstanding, not by being overruled. An argument could be made about the initial communication could have been clearer, but the consensus in the group is that this was more of an unfortunate event than bad communication.

Lastly, the project success can be indicated by achieving customer or user satisfaction, increasing competence or reputation, and on a more general note, the achievement of targets and purpose. Especially when developing a product or an app in our case, feedback from the users is essential. After all, the people who are intended for the product are in many cases also the best people to decide which properties or functions that are most valuable. The challenge lies in how that feedback is collected and processed. As elaborate upon in the section about "evaluation of the impact (project success)", we chose to use surveys as our main method of getting user feedback. Relative to the scope of the project, the participation in the surveys were high. The first survey was the foundation of the initial app design and considered very valuable. The second survey was more about improvements that would have been implemented if the project were to be continued further down the lifecycle of the product. It is, however, important to be methodically correct when conducting surveys for them to be valuable and avoid pitfalls such as confirmation bias and wishful thinking. That's why the findings were thoroughly debated internally before eventually being implemented. The main criticism of project success is that ideally, we would have had some actual user tests to really capture which features are working as intended and which areas can be improved upon.

Though a few problems along the way, and a few things we would do different by having the benefit of hindsight, we consider the overall project a success when evaluating it from different clusters of success indicators as well. The most impactful factor for the overall project to succeed and the underlying virtue by which many other factors were "built upon", was the group's ability to work like a "braintrust", as popularized by Pixar (Ranadive, 2016). That is, the ability for the group to objectively and professionally peer review each other's input, thus creating a safe environment for discussion, effective internal communication and decision making, and agility to adapt to sudden changes.

5. Most important lessons from your project

After having conducted the project and launched the app, one can certainly see in hindsight a few factors that have contributed to the project and app's success, as well as ones that put the project to a halt. Below are some of the lessons or success factors after the project was executed.

One of the actions the group took as a first initiative was to assess the skills of each individual and divide the tasks based on this. This made the work structure organized and clear to every group member. Assigning everyone a role also contributed to the motivation and thus the success of the project. The division of tasks and roles made the group members feel appreciated for contributing to their field.

Another advice to suggest is to try not to overachieve. Keep the tasks relatively simple and take small steps. This project was at a very small scale, and no serious stakeholders were involved. Therefore, the goal was to simply make a doable app. If this was a larger project with a sophisticated app, more features would be accounted for. One can conclude that the group kept the project deliverables within our means. The budget app was made to be simple and with limited features, this to keep the project's duration within the given time frame, and better ensure project success.

The last advice the group would suggest is to encourage communication. Immediately after project initiation, a group chat was made in order to keep conversation flowing between all members. This made it easy to assemble meetings and come to conclusions. It was encouraged to be vocal about ideas one liked or disliked, as well as suggestions. All group members were held to the same standard and were equally respected within their role.

One of the pitfalls that presented itself during the course of the project was that the group did not utilize the communication plan, risk assessment and other formats as much as originally planned. The group mostly implemented other strategies from previous experience. The risk assessment itself was barely checked on, if at all. The structure of the project could have been improved, had these tools been used throughout.

6. Reflection on learning and unlearning

6.1 Learning

One learning experience the group made was realizing the importance of communication with the customer while developing a new product to achieve customer satisfaction. The first lecture was an eye opener in terms of this, where we went into groups to create the tallest and most aesthetic pleasing tower, with only paper and tape. When the professor told us to start, absolutely all of the groups started discussing internally how to best solve this task. No one focused on the "customer" along the way and communicated with him in terms of what he really wanted in relation to, for example, design or height. Learning from this, the group created a survey prior to the entire project to receive feedback on what our end users wanted as value from this app, and a survey post development to see how well we succeeded on these terms, and to get improvements for future work.

Another learning experience included knowledge about html. It was only one member of the group who was doing the coding of the app and knew all the basic foundations. However, in order to create some specific functions in the app, the group member had to do some further research. These specific functions were how to make the bar chart and how to make the line on the chart ascend when the values input change.

6.2 Unlearning

One attitude the group had to unlearn was about distribution of work tasks. Normally, when working with school projects the distribution of work is split equally between all group members. This was an attitude all members shared from previous group projects. By splitting the work equally this means for example that everyone takes their part when developing the app and writing their part of the report. For this project, the group decided to split the work tasks based on skills. This decision was made because only one person had experience with coding and app development. This is a big task alone and therefore the rest of the group took care of most of the writing.

A knowledge the group had to unlearn was that developing certain functions in the app was not as easily done as thought. For example, in the planning phase the group wanted the app to have

functions where the user could personalize their own colors in the app. This was harder to code than initially thought, and therefore dropped.

A practice the group had to unlearn dealt with old habits of meeting digital. In the past two years members of the group have been used to meeting digitally. The group needed to recognize the limitation of meeting digitally, and instead start meeting in person. The group all acknowledged that this would provide better results. This required all members of the group to unlearn this habit. Situations that repeatedly occurred were that 1 or 2 group members would not meet, and instead they would participate digitally. This led to poor communication and a generally worse participation from these members.

Lastly, an attitude the group needed to discard was negative beliefs of group work. In order to become better at group communication, one has to consciously unlearn negative beliefs of group work. It is important to enter group work with a positive attitude. Especially for those in the group that had negative experiences from previous group work.

References

Bjaarstad, J. and Hvitmyhr, B. (2021). *Halvparten av studentene sier studiestøtten ikke holder*. Available at: https://www.vg.no/nyheter/i/nAmE7Q/halvparten-av-studentene-sier-studiestoetten-ikke-holder (Accessed: 26.10.2022)

Bonde, Y. G. (2022). *Studenter sakker akterut økonomisk. - De har større grunn til å gjøre opprør enn vi hadde, sier opprørsgeneral fra -93.* Available at: https://www.aftenposten.no/norge/politikk/i/7dELR3/studenter-sakker-akterut-oekonomisk-de-har-stoerre-grunn-til-aa-gjoere-opproer-enn-vi-hadde-sier-opproersgeneral-fra-93 (Accessed: 30.10.2022)

Hussein, B. (2017). The Road to Success: Narratives and Insights from Real-Life Projects, Fagbokforlaget. Pages 50-52.

Ranadive, A. (2016). *Lessons from Pixar 1: The Braintrust*. Available at: https://medium.com/great-business-stories/lessons-from-pixar-1-the-braintrust-e306843a5153 (Accessed: 27.10.2022)

Appendix

Appendix 1 - Link to product (app)

https://folk.ntnu.no/norasv/

Appendix 2 - Link to video presentation

https://drive.google.com/file/d/1W9N8v0HTmi8jvjj05nhkQQowlpUWIgLg/view?usp=sharing

Appendix 3 - Surveys

First survey: https://www.survio.com/survey/d/X5O1Q3H3C5J9X4R4M

Second survey: https://no.surveymonkey.com/r/P2GTDRS

Appendix 4 - Pre-report

PROJECT PLAN

TPK5100 – Project assignment - Autumn 2022

Group 16:

Type of project

We will be making an application that allows the user to control their budget. The user will be able to insert how much money they have per month, and how they would like to divide it between different categories such as for example food, rent and entertainment. The user can then register in the application how much they use in the different categories and see the difference from the plan.

The expected benefits of the product

Good overview of your expenses and income

Without a budget, it can be difficult to know where all your money is going. You swipe your card here and there, and suddenly it gets declined. This app gives you a good overview of all your main expenses for each month, as well as your income. The app lists the most common expenses tailored to the average student. In this way, you're able to build up the budget so it's adapted to your own needs. Students also receive a monthly payment from Lånekassen to cover fixed expenses. This payment is already inside the app. In case you have miscellaneous incomes in addition to this scholarship, this is possible to add as well. At the end of putting everything in, you will get a good overview of how your money flows.

Better control over your personal finances

When you have entered your monthly expenses and income, the app will distribute the income to the expenses and calculate for you whether you have money to set aside for savings, or if there are areas you need to "tighten up on" so you don't go into the negatives. Then you gain better control over your personal finances.

Stakeholders

The term stakeholder is widely defined. One definition from the Project Manage Institute is "individuals/organizations involved in the project or whose interest may be affected by the project or its results" (PMBOK 2004). Another definition, taken from Andresen, Grude, Haug, Katagiri and Turner (2004) is "a person/group of persons affected by or able to influence the project.". From this we can conclude that stakeholders are involved, have interests, meanings/opinions and affect the project in one way or another. Stakeholder management is about three steps: to identify the stakeholders, then analyze the stakeholders

to establish the right relationship, and lastly, how to implement the stakeholder and establish the right communications.

The stakeholders identified in this project are students, the app developer, app designer, IT-consultants, teaching assistants, teacher, project manager, report leader, group members and classmates.

There needs to be a plan on how to deal with all these stakeholders. The first step is to categorize them. This is normally done by classification along two axes. The y-axis represents the stakeholders capacity to influence the project and the x-axis represents their interests. Followed by that, the stakeholders are sorted into four groups. Table 1 shows it graphically how the stakeholders in this project are divided and how to approach the different groups.

Table 1: Stakeholders divided into groups with strategy of involvement in parenthesis.

Influence	**Interest**	
	Small	*Large*
Critical	Gr 2: app-developer, app-designer, IT-consultant (Satisfy)	Gr 1: Students/classmates, project manager, group members (Collaborate)
Marginal	Gr 4: (Monitor)	Gr 3: Teaching assistants, Teacher/Professor (Inform)

Students and classmates have been placed in the same group, group one. They differ because we have chosen a select few of our classmates to test the app. Therefore they are placed in group one. Here we need a collaboration. This for ensuring the final product to meet the end users expectations. This in order to later optimize the function of the app. With collaboration with certain classmates we can get feedback during the development of the app and change it depending on feedback. When it comes to the professor and the teacher assistants, who are placed in group three, the strategy is to keep them informed and to let them know if any drastic changes are made, or update about the progress during the project. Lastly we have group two, here is all the IT-stakeholders placed. This based on the critical contribution. Whit

out them there will be no app. Additionally they produce and build the app, after that they are finished, they do not have any expectation, for the further life cycle of the app. The strategy here will then be to satisfy, and please all they concerns.

Risk assessment plan

This project risk assessment plan indicates the main risks of the project and specifies how the risks are addressed. Risk identification is the process of identifying events or conditions that may occur during the project life cycle, and that could have an impact on at least one project objective (Hussein 2018). The risks are categorized by severity into a risk impact matrix.

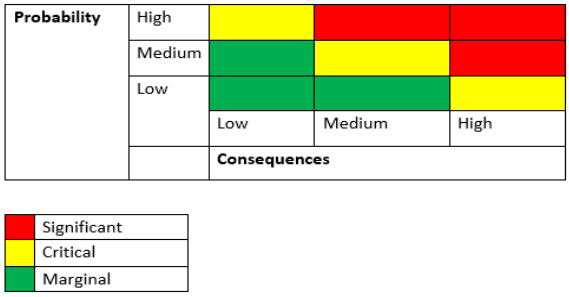

Figure 1: Risk impact matrix.

One risk is related to time management/schedule risks. This is to complete the tasks in time for planned set deadlines (dd.mm.åååå). Examples that are placed in this risk are conditions relating to the finished product being delayed.

- Code not finished in time
- Report not written within deadline

Critical risk classified: Low probability, high consequence.

This risk is addressed by creating a time schedule for the whole project life cycle, and by managing roles and responsibilities.

Another risk is related to operational risk. These risks are related to the development of the application.

- Missing skills in programming
- Computer malfunctioning
- No internet
- Other unpredictable operational risks

Significant risk classified: Medium probability, high consequence.

This risk is addressed by ensuring the right skills are in place to create the product. In addition, having a backup IT-consultant who can assist with programming the code.
Related to technical risk of application. Application not meeting the basic performance and quality criteria to function.

- Be able to use functions in the app
- Save data in the app
- Other unpredictable technical risks

Critical risk classified: Medium probability, high consequence.
This risk is addressed by having a backup IT-consultant who can assist with technical difficulties should they occur.
Related to strategic risk. Potential issues from strategic errors, such as choice of project management.
Marginal risk classified: Low probability, medium consequence.
This risk is addressed by confirming with the group that everyone agrees with how the project is managed.

Skills

The skills needed to acquire this product:

- Knowledge and experience with app development is an essential skill. To be able to use a programming language and write the code for the application is important. This skill is known by members of the group, who have experience and expertise in this area.
- Good communication within the group members and stakeholders is another skill needed for the project.

To acquire these skills the group will:

- IT-consultants are available for assistance with application development if needed.
- To acquire good communication, members of the group have a responsibility to participate in their given roles, and engage in discussions with the group.
- An online chat room so that everyone can communicate freely within the group.

Project breakdown structure

The application will be the main deliverable, and it can be divided into 4 work packages.

The first is the design of the application, which will be started before we start programming. Sub-deliverables will be sketches of the design, and how the different parts of the application will interact with each other. The next work package includes creating the overall backend structure of the application and to decide how things will be saved and how the user shall interact with the application. The sub-deliverable will then be the empty shell of an application that can start. The third work package will be to implement the possibility to enter the total sum and divide it into categories, as well as creating a visual representation of these numbers for the user. This deliverable is an application where the user can get an overview of their budget, but not their spending. The final work package will be to implement that the user can enter into the application how much money they use in each category, as well as a visual representation of the difference between this value and the estimated value. The final deliverable will then be the main deliverable, as the whole application should be done.

Schedule and time estimates

The project must be finished before 3rd of November. Therefore, we would like the application to be done before the 1st of November, to ensure a finished report. This gives us roughly 6 weeks to finish the app. We estimate that we will use one week on the design, and one week to create the structure of the app. These two tasks can start at the same time, so even though the estimate is 1 week for each of them, it might be possible to use more time on both of these tasks. They are scheduled to be finished by the 2nd of October. For the final two work packages, we estimate that we will use two weeks on each of them. The third work package should then be finished by the 16th of October and the last by the 1st of November. See table 2 for an overview of the schedule.

Table 2: Schedule.

What	**Time estimate**	**When**
Design	1 week	25.09
Backend structure	1 week	2.10
Enter total sum and per category	2 weeks	16.10
Enter money used	2 weeks	1.11

Success factors

The success of a project varies from project to project and can be difficult to define. In general, a project's success depends on how success is evaluated, and which factors contributed to the project's success; the success factors. The success of a project can also be described depending on the view of certain stakeholders, the timeframe or costs. Further, it is important to mention that one must distinguish between project success and project management success. Evidently, defining and measuring the success of a project can be challenging, and the complexity of defining how well a project has delivered grows with the scope of the project.

Our strategy is to establish success criteria early and use it as a tool for shaping and managing the project, as well as to avoid disagreement when evaluating the project success, as proposed by Hussein (2018). This approach establishes a framework early on to for example assess risks. And by involving different stakeholders in the process, creates a shared foundation for the project. By pre-defining success factors early on, it can also create a sense of motivation or responsibility for the parts involved, because the criteria for evaluation is already defined. It is therefore crucial to take the necessary time when defining aspects of project success. For this project, the success factors can be summarized as follows:

- **Time frame**: Because of our short time frame, being able to maintain the timeline, or the timeline itself, becomes a crucial success factor. If the project is not finished on time, the project will automatically be considered unsuccessful. Some delay can be tolerated when working towards subgoals, such as those mentioned under "Schedule and time estimates", but because of the overall short horizon, any delays should be considered with caution.
- **Effective communication**: Good communication between team members are considered critical when execution time is the most important success criterion, as is the case for this project. This is further described later on under "communication plan".
- **Value for users / client consultation**: If the service isn't valued by the user, the project should not be considered a success. The challenge lies how to measure the value, as this is a highly subjective matter. As it is a service being built by and for students, evaluation of which degree of utility was achieved will be discussed

internally. Ideally, we will also try to get feedback from another student group, which hasn't been part of the development as a control group, both before, during and after the project deadline.

Roles and responsibilities

All projects need to be organized. One definition of an organization is as a group of people who must coordinate their responsibilities in order to meet their objectives (Kerzner 2013). From here there are many ways to go, but from a project point of view it can be divided into three types of structures to get organized: Functional structure, project structure, and matrix structure (Hussein 2018). This project is following the functional structure.

The functional structure is based upon the concept of dividing the participants into departments, based on their knowledge. Each department has their own task within the project and all decisions are made internally. This structure leaves the project manager with no power. The communication is done directly between the sub-leaders of the departments. Members of the departments work simultaneously with the project and everyday tasks at the same time. The foundation of this project organization is a functional structure, but it is customized to fit our situation and project. Everyday tasks will then be weekly hand-in assignments, which is not under one specific department, but more a general task for all group members. At the same time the group members will work on the project and then under one of the departments. Beneath follows a description of the different roles which are graphically shown in figure 1.

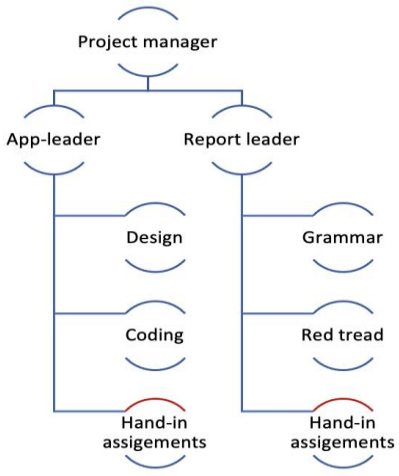

Figure 2: Illustration of this project roles based on a functional structure.

The project manager does follow the project from start to end. To ensure that all the tasks get done, the deliverables meet the outcome, and within the specified constraints. This will be the main role of the project with the largest amount of responsibilities. The responsibilities will be to plan and schedule the project, lead the group, monitor the process, set deadlines and solve issues. Anyway the leader will not be totally alone on the top, right after follows the sub-leaders.

The sub-leaders have the responsibility for the task in that specific department. Here it is divided into two departments. The app-department and the report or writing department. The app-department has the responsibilities for developing the app. Here the sub-leader is called the app-leader, with the overall responsibility for producing the app. Hereunder are responsibilities as design of the app and coding. Over to the other department which is called the writing department. The leader here has the overall responsibility of the written report. This includes the responsibilities of correct grammar in the report, making sure it is a red thread throughout the report and that all the participants contribute.

Lastly, we have the group members. Since this is a school project it is of all participants interest to do good and get a good grade. Therefore all the members of the group have an overall responsibility to get the work done and manage to deliver on time, both the objectives and the report. Therefore all the group members have individual responsibility to do their task, help where needed, and keep the spirit up.

Communication Plan

In order to ensure the satisfaction of the stakeholders identified, a communication plan is needed. The first step is to establish the main purpose. Which in our case is to help students optimize their budget and save money long term. The second step is to establish goals in order to achieve our purpose. These goals are action oriented and measurable, with the audience and stakeholders mainly being kept in mind.
Goals set so far:

- Determine general design of app.
- Code input and function into the app.
- Polish the design to make it user friendly and intuitive.

- Communicate it and deliver it to stakeholders.
- Adapt and change the app according to feedback.

Seeing as the main stakeholders have been identified, we have to make sure they benefit from the support of the project. It's important to understand their needs, and therefore one should get to know some of the stakeholders involved. This gives direct communication and an agreement between developer and stakeholder. The goals set will be communicated with the stakeholders, as well as the timeframe for when each of these goals should be achieved. Below is a table for the communication plan.

Table 3: Communication plan.

Audience	**Communication goal**	**Tool**	**Frequency**
Group members	Dividing of work	Meetings (In person or Zoom)	1-2 Times weekly
Professor/Assistants	Status Update	Email	N/A (Determined depending on need)
Classmates	Showcase app for feedback	In-person meetings	N/A (After app is done, then again after feedback is received)
All stakeholders	Development of the project	Informational video	Once (Submitted with report)
Group members	Report writing	Meeting (In person or Zoom)	1-2 Times weekly
Students	Spread app usage	Present/Communicate	N/A

References

Andresen, E.S., K.V. Grude, T.Haug, M. Katagiri and J.R. Turner (2004). *Goal Directed project Management: Effective Techniques and Strategies.* London: Kogan Page.

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

Kezner, H. (2013). *Project Management: A system Approach to Planning, Scheduling, and Controlling.* Hoboken, NJ: Wiley.

Project Management Institute (2004). *A guide to the Project Management Body of Knowledge (PMBOK guide).* Newtown Square, PA: Project Management Institute.