



Final User Centered Design Report
CPSC 481 – Fall 2020
Team Project, Stage Five

Tut04

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Team T

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Repository: <https://github.com/isaguimet/CPSC481-TeamT>

Portfolio: <https://gbondad.github.io/481portfolio/index.html>

Executive Summary

As university students, we understand the difficulty that comes with being enrolled in multiple courses, working part-time, participating at extracurriculars and being organized to stay on top of one's classes to complete assignments and projects on time. It can feel overwhelming to see all the assignments and projects one must complete week after week until the end of the semester. Without knowing how much these tasks will take and the pile of unending work, procrastination and stress come to light. Progress Calendar is a web application that facilitates and solves these worries by visually showing the user how many tasks they need to complete to finish an assignment and / or project. This project management app helps the user tackle tasks one step at a time by allowing them to break down a project into iterations.

Introduction

Our team decided to develop a web-based calendar/project management application that will visualize the amount of work we have to do for projects, with a rewards page showcasing the rewards the user has earned for finishing projects. In this report, we will describe the problem and our solution. Additionally, we will describe our end-users, stakeholders, user research methods and the process we took to conduct each of the user methods and our findings. We will also discuss about how we decided on the important design choices for our application. Then, we will introduce our low fidelity design as well as the lessons we learned. Similarly, we will introduce our work for our high-fidelity design and the lessons we learned. This report will also discuss our heuristic evaluation and findings to iterate our first version of our high-fidelity prototype. And we will discuss the changes we applied to our high-fidelity prototype based on the heuristic evaluation conducted. Lastly, we will discuss about the changes we made on the final high-fidelity prototype in this final stage and discuss about any changes we should and could do in the future iterations of this application.

Design Problem

As a student, there are times when a project can just become too big for us to handle. It is all too common for a bulk of an assignment to be finished on sleepless nights, pumped by the sheer fear of a deadline looming. What if there was a way to split large projects into manageable pieces all while showing your progress in easy-to-understand statistics? Despite the many calendar

applications on the market like Google Calendar that lets you organize your due dates for events you may have, we have not found a calendar application that can break down project into iterations and keep track of the progress of the user in finishing these projects.

Design Solution

To solve the design problem, we decided to come up with Progress Calendar. It is essentially a calendar application with project management features that will be available in web platforms. This application helps users manage projects by breaking it down into iterations and automatically visualize their progress, helping users curb procrastination. The app tracks the progress of a project and visualizes it in a way that is both informative and transparent to the user. A user will be able to add scheduled projects and tasks. A project is broken down into user defined number of iterations, which can be easily pinned to a date. In progress view, a user will be able to view all their progress on their projects like how many iterations they have to do left. There is also a rewards view, showcasing the different achievements the user has done in finishing projects while allowing the user to connect with their friends and see how they compete. The user base will be people who want to keep track of their projects, this can range from students to project managers. We expect this to be used in the everyday lives of our users, as a calendar and for helping them manage their work and stay motivated.

End-users and stakeholders

Our primary end-user are students, as this could help them with their projects/assignments by breaking them down into manageable iterations as well as showing them their progress on their different projects. Other potential users are Employees and freelancers, for its project management features. Non-power user can also use this as a basic calendar app. Our primary stake holder is our team as we are striving to develop an app that our users will value. And finally, we consider our users to be a stakeholder as they have all to benefit from an app like this. More information on our End-user and stakeholder are in the Appendix.

User Research Methods, Process and Findings

1). Surveys and Questionnaires

We used Google Forms to conduct an online survey. First, we learnt that more than half of our participants used digital devices for keeping track of projects and tasks. We also learned that people enjoyed having the convenience of adding tasks / projects to their calendar app anytime, anywhere. Having a clean and easy to learn interface was also important to users. On the other hand, users don't like that their current products don't allow them to see how much they have

completed a project or an assignment before the deadline or ways to personally customize it. Lastly, we asked participants what features they would like to see on our calendar app. They said, being able to categorize projects by different groups such as school and work, must be highly customizable to the need of the user and display how much time they have worked for a given project.

2). Competitive Product Survey

For this method we reviewed Notion, Google Calendar, and Habitica. For the Notion application, we focused on the calendar feature of Notion and the project management that can be done with it. Reviewing Notion, we saw that a Kanban board is useful for project management.

We conducted evaluations of Google Calendar on the desktop only. We learned that on Google Calendar, you can easily add events, tasks or reminders to a selected date from a small popup window. A con that we found was that you cannot color-code tasks and reminders, so it is hard to tell what course or project the task belongs to. This was a feature that we wanted to include in our application.

Habitica is a task management/game app that gives game rewards when a user finishes a task. We found that this feature that merges rewards with task management would work well in our app.

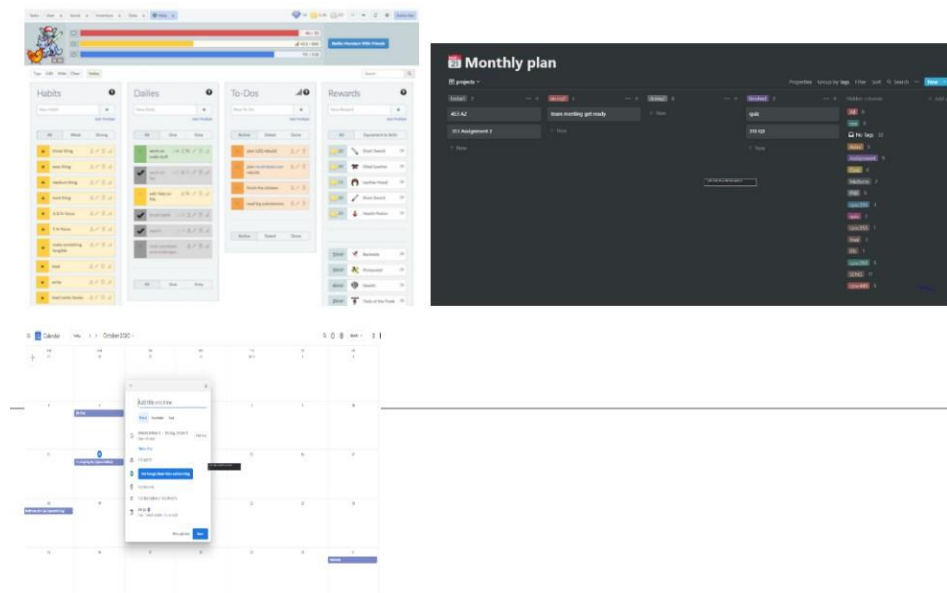


Figure 1 - (from left to right, top to bottom) Screenshots of Habitica, Notion and Google Calendar applications

3). Paper Prototyping

For this method, we had each person on our team rapidly sketch, layout, and evaluate interaction design concepts for basic usability. By using our knowledge from the competitive product survey, we were able to see how different apps are designed and how we could apply some of their good

UI elements and unique features in ours. Paper prototyping was essential in nailing down the look of our project and the specific features that we wanted to include and their implementation.



Figure 2 - Collection of our paper prototypes

Important Design Choices and Justification

Our design choices originated from the work we did for the ideation process. The user research methods we conducted in stage 2 and the brainstorming sessions we had in stage 3 made us consider the types of features and views we wanted to have in our application. We then decided to create a navigation bar containing links to each of the 4 views in our application, allowing our users to quickly navigate through the different views. From our competitive product survey, we opted to implement a minimalistic design that is a prominent design choice in current apps. From our brainstorming we decided that it made sense to show progress bar that could be broken into iterations for each project in Progress view. Lastly, we wanted our application to be competitive and familiar; implementing all the functionalities of a calendar app that the user expects while implementing the other features in a way that is familiar to them.

Low-Fi Design and Lessons Learned

We prototyped and evaluated 3 vertical user tasks: adding a new project, viewing and updating progress of projects in Progress view, and viewing rewards (and using other features such as Share, Connect and Rank). Next, we conducted a cognitive walkthrough on our low-fi prototype. From the cognitive walkthrough we were able to identify some problems. First, we found that it might be confusing to users on how to create iterations when creating an event, so we added

text whenever a user hovers the iterations text. We also noted that when a user creates multiple iterations for a project, the user might want to see what they just created, so we are highlighting all their newest created events for ease of visibility. We also found that some of our icons in our web application would not motivate the user to click on them and they could also be confused on what function these buttons have. So, we added extra text on top of the icon and hoped to add some hovering features such that when a user hovers a progress bar the iterations to be completed can be highlighted in a color to represent it can be clicked on.

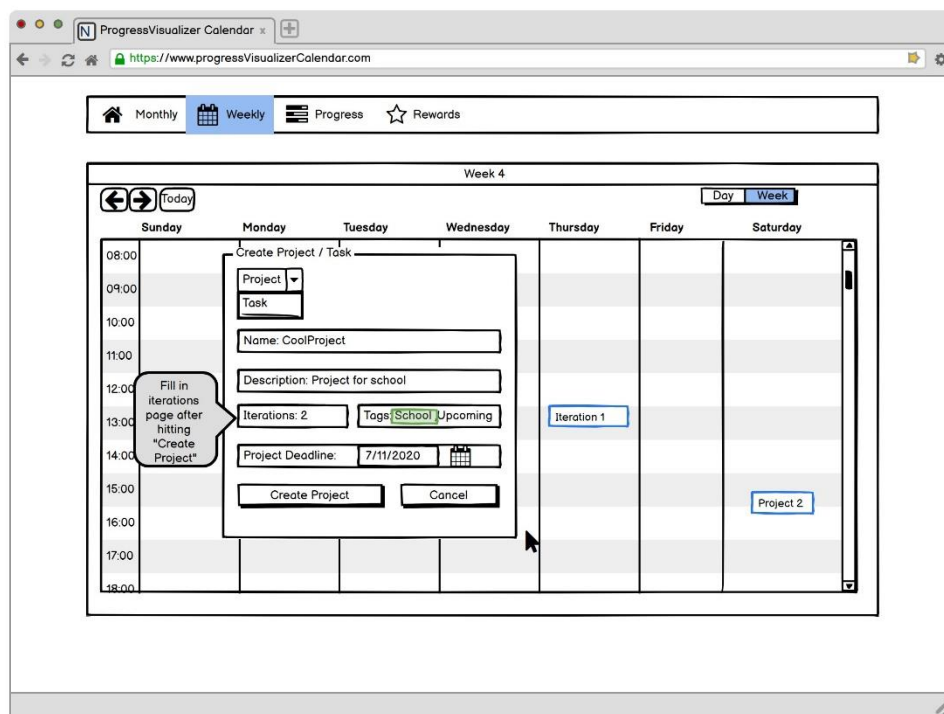


Figure 3 - Snapshot of our low-fi design on Balsamiq; adding a new project

Hi-Fi Design and Lessons Learned

In the initial hi-fi prototype, we added one key vertical task, which is to edit/delete a project. We also implemented some horizontal tasks in order to improve the user experience. We used Adobe XD to help us make a prototype that was ready for usability testing. We had started by first looking at our low-fi prototype and copying over our design as a base while also changing it to look closer to our design ideals. By using free templates on Adobe XD that have modern design, we were able to learn about different designs that could be done in Adobe XD that were not only appealing but also more consistent with modern design. We learned that it was essential to have consistency in design when working in groups in order to make a design that is unified.

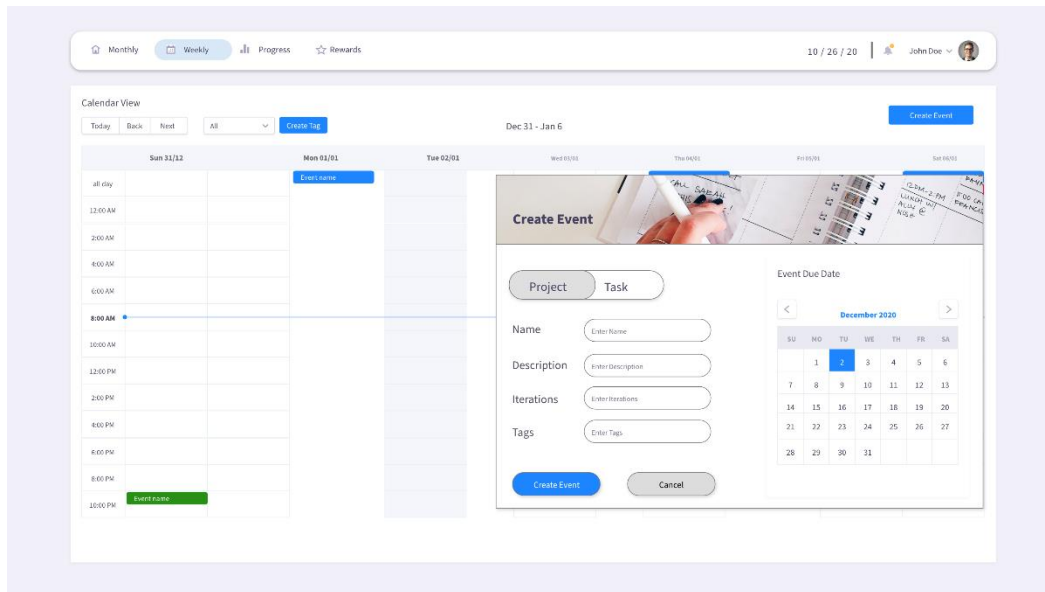


Figure 4 - Snapshot of our hi-fi prototype on Adobe XD; adding a project

Heuristic Evaluation and findings

We divided ourselves into 2 groups: evaluators and reviewers. Jiro and Alexis were the evaluators and Gabriel, and Isabella were the reviewers.

The evaluators closely followed the given template to understand the rules that could improve the UI design. They documented the rules that are being implemented or violated by listing them out in a table. With this list, the reviewers were able to categorize them according to their severity and as a group we decided which ones were the most urgent and needed to be changed. One major flaw that we found was that the user is not able to undo when creating projects violating user control and freedom. A detailed list of our findings is in the Appendix.

Design Changes made based on Heuristic Evaluation

The design changes we made in our high-fidelity prototype based on the heuristic evaluation in stage four are the following:

- Make the design of the “Create” button project consistent in weekly and monthly view
- Add a confirmation message when creating projects/iterations
- Includes an “undo” button for the monthly and weekly view when creating a new event.
- Be able to click on name of user and display user information (drop-down menu for “John Doe”)
- Remove blank spaces between UI elements

- Include a “Support” feature with “help” (includes instructions on how to complete various tasks on the app) and “send feedback” options

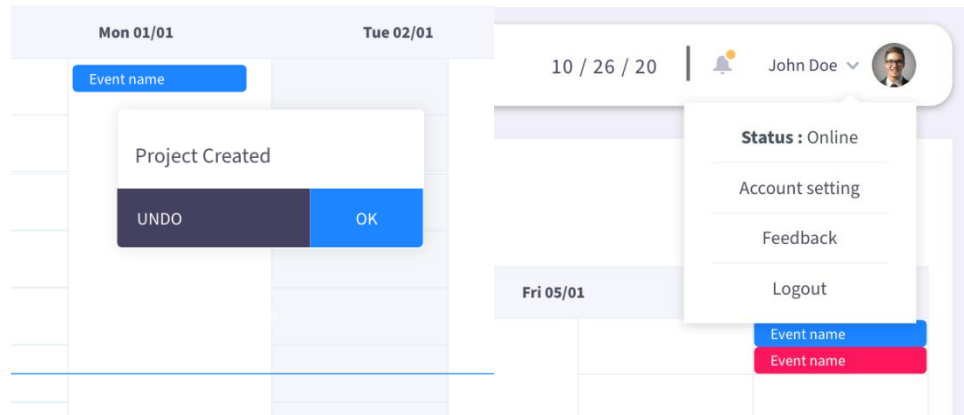


Figure 5 - (left to right) "Undo" button along with a confirmation message after creating a new event, drop-down menu for "John Doe"

Final Changes of High-Fidelity Prototype

The following are our two vertical tasks added:

1) Create tags. There is now a button beside the tags that a user can click to open a menu and create a new tag.

2) Filtering Tags on the Rewards View. Now the user can filter their rewards based on specific labels. For example, the user can see all the rewards earned for their schoolwork vs for their exercise goals.

We also implemented an improved visual design by removing unused white spaces, the ability to undo creating projects, and made the views more consistent by removing the create button on progress view. A support feature was also added, with a help option that has useful links to help the user, and a send feedback link to allow the user to communicate their concerns to the developer.

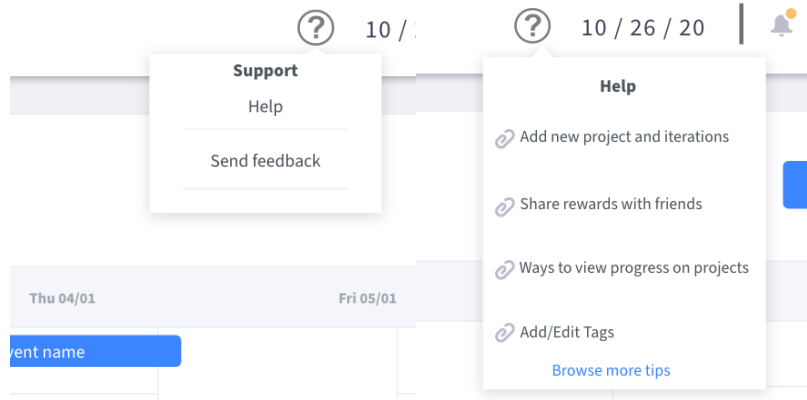


Figure 6 - (left to right) "Support" main tab, "Help" main tab

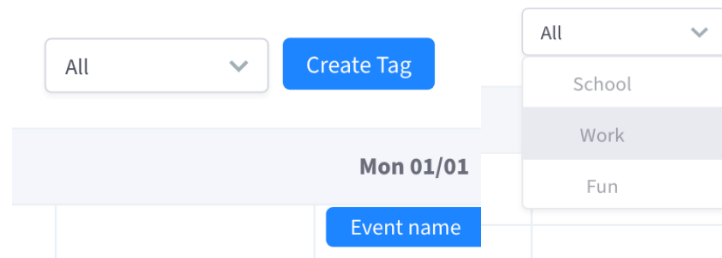


Figure 7 - (left to right) "Create Tag" button, filtering tags tab

A detailed list of our changes is in the Appendix.

Possible Changes for the Future

Other changes that should be done in the future would be to include documentation and links for the "Support" feature describing how different features work in the application.

Other changes that could be done in the future would be to design this application for mobile interfaces. It would also be interesting to see this application be added as a plugin/add-on to Google Calendar and other project management apps. Another change that could be made is a choice for a dark mode. There could also be an option to share the calendar with collaborators.

Conclusion

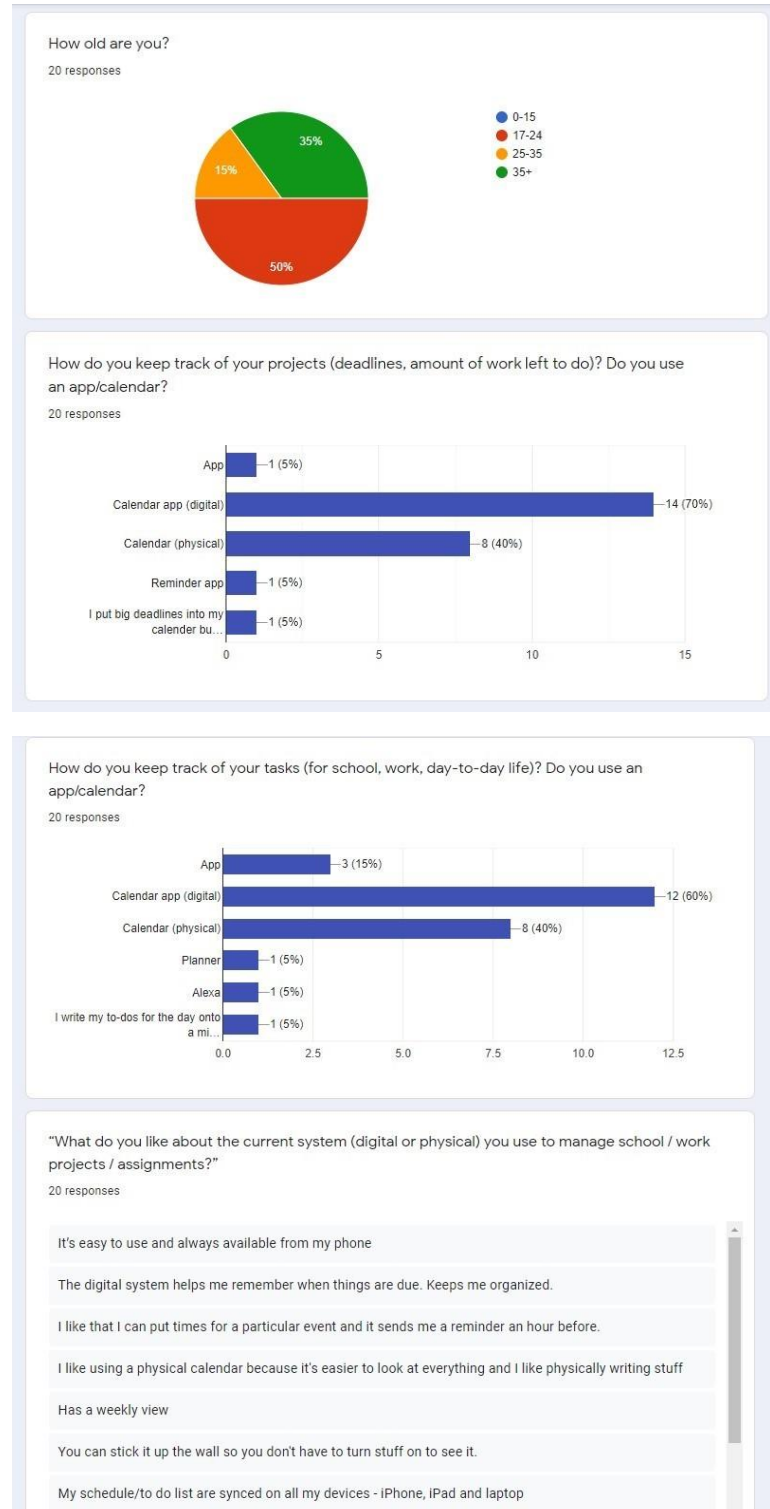
In this project, we learnt various key lessons that are needed to create a functional and usable high-fidelity prototype that applies UX/UI design principles. Starting from the very basics to understanding our problem, brainstorming different solutions and conducting user research to

understand our customer base were all important steps needed to have a feel on what kind of application we were going to create. Then step by step creating a low fidelity prototype and iterating the design and functionality based on the cognitive walkthrough. This cognitive walkthrough was very important to us to see how we can motivate our user base better in a way that makes their user experience memorable and efficient. In the last steps of our project, we created the high-fidelity prototype and iterated on this design by performing a heuristic evaluation. Lastly, we finalized Progress Calendar and we hope for this application to be developed so that users can manage their work and stay motivated.

Appendix

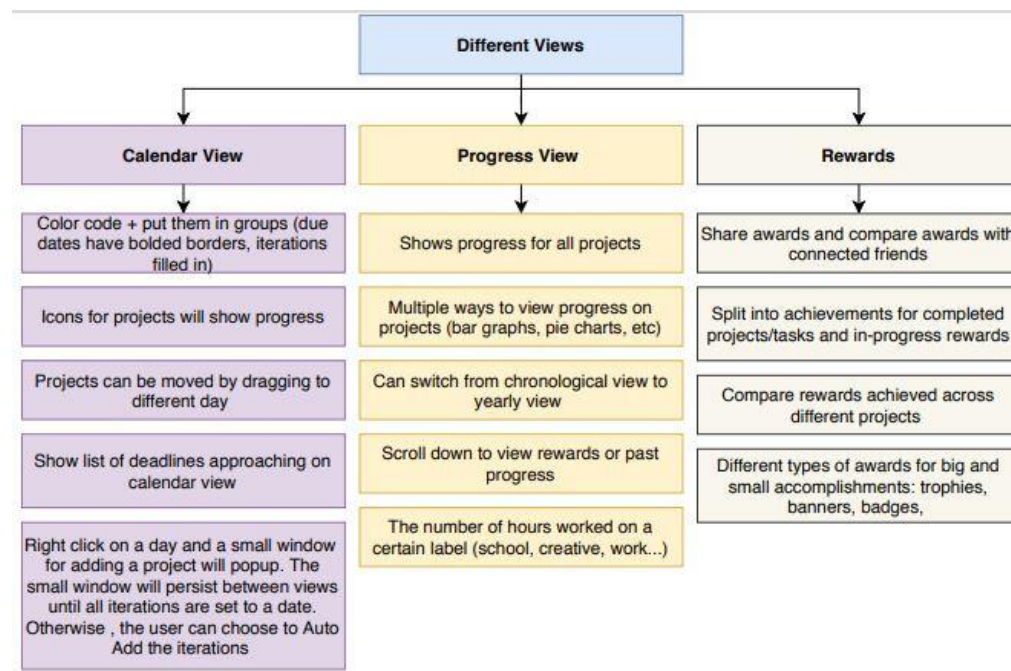
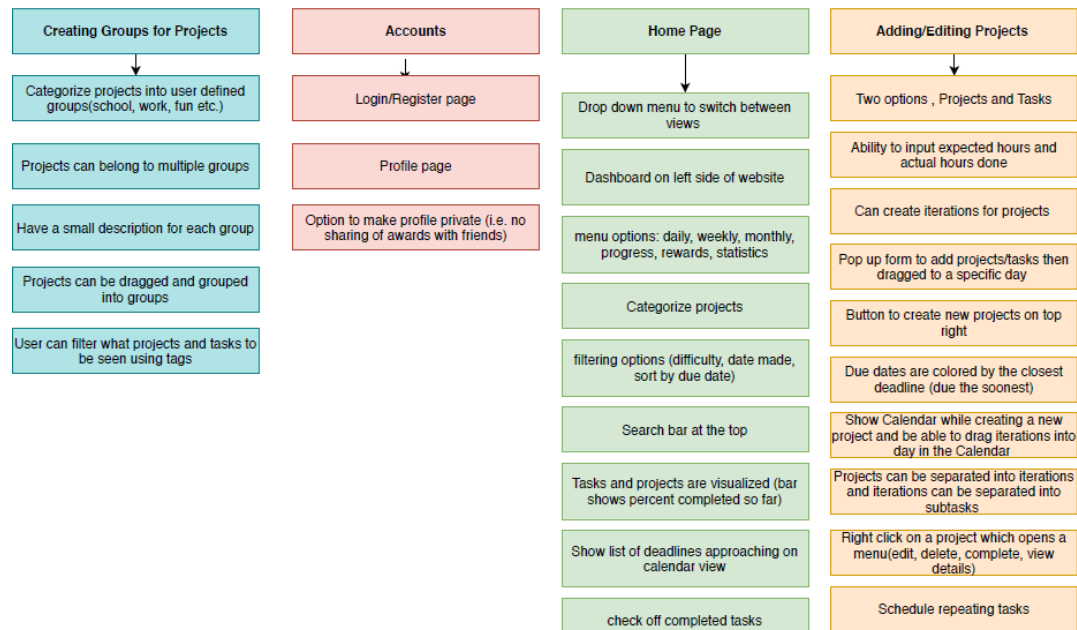
User Research

The following is our user research results for the surveys and questionnaires.



Affinity Diagram

Our affinity diagram contains 5 different groups organized by the types of views we have in our web application and unique functionalities.



END USERS AND STAKEHOLDERS

Students	Students who struggle managing deadlines for projects and homework. Students may have experience with using some type of scheduling/planning. In terms of their background knowledge, students would be comfortable and quick in adapting to simple, web applications.
Employees	Most employees would have used a task management system before. If a company had a common task manager system that all employees were required to use, they may easily adapt to our task management application. Some examples of jobs include teachers and project managers.
Freelancers	Freelancers have the flexibility to manage their own schedule, most of them will have lots of experience using a task management system.
Our team	We have tried other task/project management apps and want to create a better solution than the currently existing solutions. Since we are the stakeholders who develop and maintain the application, we would have the most knowledge about the system because we will make it.

Heuristic evaluation

- **Evaluators:** Jiro, Alexis
- **Reviewers:** Gabriel, Isabella

First evaluator: Jiro

10 Steps to Improve Usability, Utility, and Desirability by Implementing Nielsen and Molich's UI Design Guidelines

Rule of Thumb	Is this rule being applied? How so?	Is this rule violated? How so?	How can this rule further improve usability, utility and desirability?
1. Visibility of system status	Confirmations on actions are present in the prototype (connecting a friend would result in a "added friend" pop-up;	When creating an event or a project, it is unclear to the user that they first need to pick a date in order to make iterations.	It would inform the users of the current status of the app. Without this rule, the user would wonder if the app has done what

	completing a project displays a congratulatory prompt)		the user wants to do, impacting the usability and desirability of the app.
2. Match between system and the real world	Yes, it is applied. Conventions like create buttons and monthly and daily views are reminiscent of current calendar applications.	Having a progress and a rewards view is unusual in a conventional calendar app, however its intentions are clear to the user.	This rule helps the user recognize the actions that they can make as they already know what to do.
3. User control and freedom	There are cancel buttons when creating projects and in options like connect to friends and sharing.	When creating a project, once a user has chosen an iteration, they cannot go back. It is also unclear how to undo a progress on a project in progress view. On rewards, there seems to be no clear way to go from rank to original rewards page.	With this rule, users will be able to cancel or go back unwanted actions.
4. Consistency and standards	Text fonts and sizes are consistent. There is a consistent color palette.	Create button in weekly, monthly, and progress are different. And the add button on progress does not work. There is also 2 ways in order to move from weekly and monthly in the monthly view. Monthly view also has varying designs on buttons.	This is important as to make a consistent user experience.
5. Error prevention	There doesn't seem to be any error Prevention in the app. However, cancel buttons are present so that the user will be able to go back to a state they want.	No error prevention present in the prototype.	Without this, errors would be prevalent greatly affect the user experience.

6. Recognition rather than recall	When creating an iteration, the iterations are shown in a small preview of the calendar, helping the user in creating a project.	There is little violation to this rule meaning conventions are being followed.	This would help the user in navigating the app as they rely on the conventions of similar apps.
7. Flexibility and efficiency of use	The normal functions of a calendar app are implemented but features like Progress view and Rewards view are catered for those who want to fully utilize the features of the app.	The progress view Despite being a main feature of the app, does not have an ability to customize the statistics that a user will be able to view. Limiting the user of options.	This makes the app cater to both basic users and power users.
8. Aesthetic and minimalist design	The design is minimalistic and only one instance of redundant functions.	Changing view in the monthly from weekly and monthly is redundant. There is no need for there to be 2 ways to change views.	A minimalist design improves the user experience as it does not confuse the user with unnecessary or redundant functions.
9. Help users recognize, diagnose and recover from errors	There are no error messages in the high-fi prototype.	--	It is important that the user will be able to act after an error has occurred so that they may continue to use the app.
10. Help and documentation	There is little help or documentation in the app.	When creating a project there is no guide to help the user to create iterations, making it unclear what the user should be doing. Text fields don't show what input is accepted (iterations should be an integer)	This allows the user to understand the functionalities of the app.

Second evaluator: Alexis

10 Steps to Improve Usability, Utility, and Desirability by Implementing Nielsen and Molich's UI Design Guidelines

Rule of Thumb	Is this rule being applied? How so?	Is this rule violated? How so?	How can this rule further improve usability, utility and desirability?
1. Visibility of system status	Confirmation messages for "Connect with Friends" and share/copy link.	No confirmation message that the project/iteration(s) were created.	It would keep users informed about the tasks they are doing on the app.
2. Match between system and the real world	The icons at the main navigation bar follow typical conventions.	No particular design aspect violating this rule could be found.	Ensuring that the UI elements use familiar concepts to the user will make it easier for the user to learn the application.
3. User control and freedom	There are "cancel" options when creating a project or sharing a rewards page.	1) The "monthly" button does not work under the progress view. 2) "Undo" option on the confirmation page immediately after creating a project/iteration may be helpful. 3) In progress, no feature to undo a selection of a progress bar.	User control and freedom will allow user to easily and quickly fix any mistakes they may have made while using the application.
4. Consistency and standards	The overall UI design seem consistent across the different views.	1) The words "event" and "project" used interchangeably is confusing – e.g., you click on "create event" to create a project. It also says "Event Due Date" when a project is being created. 2) In rewards, when you copy a link, the confirmation message shows up under the	This will reduce the chances of the users having to guess/be confused about different features across the app.

		<p>Connect button instead.</p> <p>3) In rewards, the rightmost box says “Awards” instead of “Rewards”.</p> <p>4) Expectation when clicking on “John Doe” is a drop-down menu displaying the user information.</p> <p>5) Clicking on a project to view details about the project + option to edit/delete project.</p>	
5. Error prevention	No error prevention features found.	With the features implemented in the hi-fi prototype, error prevention methods do not seem necessary.	Error prevention features reduce the chances of a user potentially making a mistake in the first place.
6. Recognition rather than recall	Selection of dates from the calendar on the pop-up window when selecting iterations.	No violation of this rule seems to be found.	Recognition rather than recall rule will put less pressure on the user to remember all the steps/options.
7. Flexibility and efficiency of use	Users can select a date on the monthly view rather than the “create an event” button.	When creating a project, a user cannot create a new tag in the pop-up window.	Accelerators will ensure that users can use the app more efficiently as they become more experienced with it.
8. Aesthetic and minimalist design	Consistent color scheme and design layout is present. No irrelevant information can be seen.	Too much blank spaces between the UI elements (especially the white space in profile for the rewards page).	Aesthetic and minimalist design boosts the overall experience of the user on the app.
9. Help users recognize, diagnose and recover from errors	Implementation of error messages is not found.	In rewards, error message when invalid email address is entered may be necessary.	Clear and easy error messages will a solution allow user to fix the problem quicker with less trouble.

10. Help and documentation	No help or documentation is provided.	An explanation on the concept of the rewards page (and possibly the progress page as well) may be necessary.	Documentation supports user in learning/understanding different functionalities of the application.
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Reviewer's Heuristic Evaluation Findings

Below is how we are classifying the prototype problems severity as it was discussed in the heuristic evaluation lecture.

Examples of Severity Ratings

Rate	Description
0	Doesn't seem to be a usability problem
1	cosmetic problem
2	minor usability problem
3	major usability problem; important to fix
4	usability catastrophe; must fix

First reviewer: Isabella

First, I reviewed each of the rules that the evaluators (Jiro and Alexis) did. Then for each rule, I jotted down my findings. After that, I categorized each usability problem I found into the appropriate severity rating.

1. Visibility of system status

- This rule was found to be violated.
- We need to add the current status of the system i.e., "has added event into calendar", "has created iterations" when user creates events

2. Match between system and the real world

- This rule was found to be satisfied. Users can create calendar dates similarly like they would do for any other website app and navigating through the website app via the navigation bar is a common concept to many users.

3. User Control and Freedom

- This rule was found to be violated.
- Must add undo and redo buttons for creating iterations for events, progress view (undo progress), rewards page (go back from rank to original rewards page)

- This is important

4. Consistency and Standards

- For the most part this rule is being violated and the following are violations of this rule
 - i. make 'create buttons' for weekly, monthly and progress view consistent
 - ii. Decide if we're using "event" and "project" as 2 different things or pick one and stick with it for the rest of the application
 - iii. Be able to click on name of user and display user information
 - iv. Be able to click on a project in calendar and view details about it + edit / delete it.
 - v. Rewards vs awards in rewards view -> be consistent

5. Error Prevention

- This rule was found to be violated for one evaluator. We found that there is no error prevention in the app. However, cancel buttons are present so that the user will be able to go back to a state they want.
- This rule was found to be satisfied for the other evaluator. This is because with the features implemented in the hi-fi prototype, error prevention methods do not seem necessary.

6. Recognition rather than recall

- This rule was found to be satisfied by our application

7. Flexibility and efficiency of use

- This rule was found to be violated. The user should be able to do the following things:
 - i. User should be able to customize the statistics that they want to see for their progress view
 - ii. User should be able to create new tags when creating an event

8. Aesthetic and minimalist design

- For the most part, this rule has been satisfied except for a few minor cosmetic things to add such as:
 - i. remove being able to change view weekly to monthly. Reason: redundant to have 2 ways to change views
 - ii. Remove blank spaces between UI elements

9. Help users recognize, diagnose and recover from errors

- This rule was found to be violated. The following should be included:
 - i. Error message when entering an invalid email address

10. Help and documentation

- This rule has been violated since there are no help guides at all in the high-fidelity prototype. This can be solved by:

- i. adding a guide to help users create an event with iterations. This can go under “need help?” button for monthly and weekly views. Add better acceptable input text to text fields
- ii. In-app guide to help explain rewards and progress view

Below I categorized each of the usability problems found into categories of severity.

Severity 0 - Doesn't seem to be a usability problem

- Rewards vs awards in rewards view -> be consistent
- In-app guide to help explain rewards and progress view
- Adding a guide to help users create an event with iterations. This can go under “need help?” button for monthly and weekly views.

Severity 1 – cosmetic problem

- Decide if we're using “event” and “project” as 2 different meanings or pick one and stick with it for the rest of the application
- Remove blank spaces between UI elements
- Error message when entering an invalid email address
- Add better acceptable input text to text fields

Severity 2 – minor usability problem

- Add the status / confirmation message i.e., “has added event into calendar”, “has created iterations” when user creates events
- make ‘create’ buttons for weekly, monthly and progress view consistent
- Be able to click on name of user and display user information
- user should be able to customize the statistics that they want to see for their progress view
- User should be able to create new tags when creating an event

Severity 3 - major usability problem; important to fix

- Fix rewards page (go back from rank to original rewards page)

Severity 4 - usability catastrophe; must fix

- Be able to click on a project in calendar and view details about it + edit / delete it .
- Must add undo and redo buttons for creating iterations for events and undo buttons for progress view (for progress bar)

Second reviewer: Gabriel

Based on the findings from the evaluators, I wrote down my thoughts and then classified the severity of each usability problem.

1. Visibility of system status

- Add a confirmation pop up when an event has been created

2. Match between system and the real world

- The system uses conventions that are found in many current calendar applications. It uses icons that clearly reflect what they represent.

3. User Control and Freedom

- We need to ensure that users have a way to cancel/undo any action they make.

4. Consistency and Standards

- Make the create buttons in weekly and monthly view the same

5. Error Prevention

- There is no error prevention in the application. Should add error handling.

6. Recognition rather than recall

- The rule does not seem to be violated by the application.

7. Flexibility and efficiency of use

- Have a way to create new tags when creating an event

8. Aesthetic and minimalist design

- Remove the button to change from weekly to monthly, since you can already do so through the navigation bar. Other than that, the system has a simple and easy to use layout.

9. Help users recognize, diagnose and recover from errors

- There should be error messages that indicate what the problem is and what needs to be fixed.

10. Help and documentation

- Add a help section somewhere in the application in the future.
- Have a quick tutorial on creating an event for first time users.

Severity 0 - Doesn't seem to be a usability problem

- Help link to explain app
- Instruction support page

Severity 1 – cosmetic problem

- Remove blank spaces

Severity 2 – minor usability problem

- Add error prevention

- Add confirmation message when creating projects/iterations
- Add options to customize statistics in progress view
- Make text fields more help full

Severity 3 - major usability problem; important to fix

- Make create project button look the same in weekly and monthly view

Severity 4 - usability catastrophe; must fix

- Make project clickable to view/edit/delete

List of the Final changes made to our prototype:

The following are changes we did for our final hi-fi prototype:

Progress View Changes

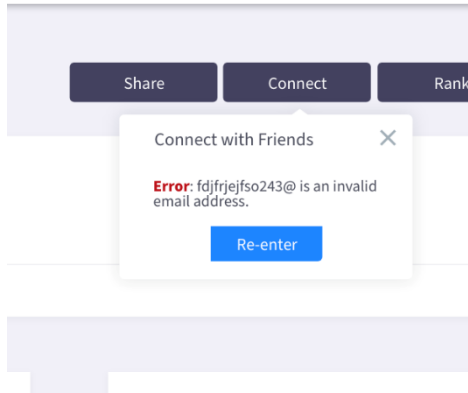
- Improved the visual design of our application by removing unused white spaces
- Removed the create button so the progress view was consistent in terms of visual design with the other views
- Added a second statistic for users to see their progress
- Include a way to “undo” progress bar when completing iterations

Rewards View Changes

- Fixed a visual alignment for the “send/copy link” text to go under the Share button instead of the ‘connect’ button
- Fixed navigation bar to remain at the top of the page when scrolling down

Application Changes

- Increased font size to all views:
- Error handling
 - Enter a wrong email under Rewards



Lastly, we implemented a “Support” feature. The “Support” tab includes options “Help” and “Send feedback”. The “Help” option includes a list of links for the tips on using the application. The “Send feedback” option simply allows the user to send a feedback on their experience using the application. This feature is prototyped horizontally.