2020

Online Project Management Website
Final Project Report

CS 467
Fall 2020

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Introduction

Team “PM” was given the opportunity to take the open source Perro Project (https://github.com/moof2k/perr) and improve and extend the capabilities to build a lightweight online project management website to track project effort and progress. The resulting project is the first phase of a project management web application built on and hosted by the Firebase platform. It is a multi user application, backed by a NoSQL document based database using Firestore, with Google Authentication implemented to authenticate users before they can enter into the world of Project Management at mypmwork.com.

At the basic level, Mypmwork.com allows for users on a team to manage projects. New projects can be created, stored, and tracked. Users can add tasks describing work that needs to be completed to accomplish the goal of the project. And as the project progresses, they can view the progress and remaining work in the form of a table showing the raw numbers and percentage of the project completed, as well as in the form of a Chart showing a visualization of the progress in conjunction with the total and remaining work to be completed for the project.

Team “PM” Members:

Gerson Lindor Jr.
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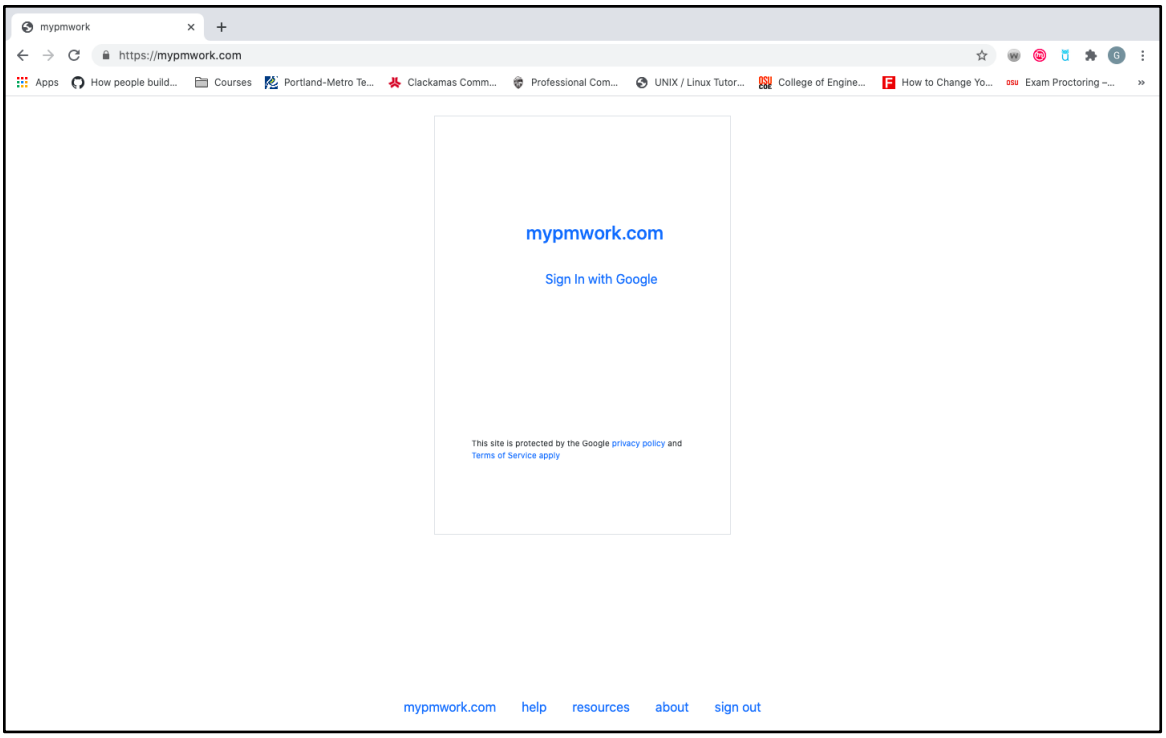
Website: https://mypmwork.com

Github Repository: https://gihub.com/CS467-Perro-Team/perro-pm-project

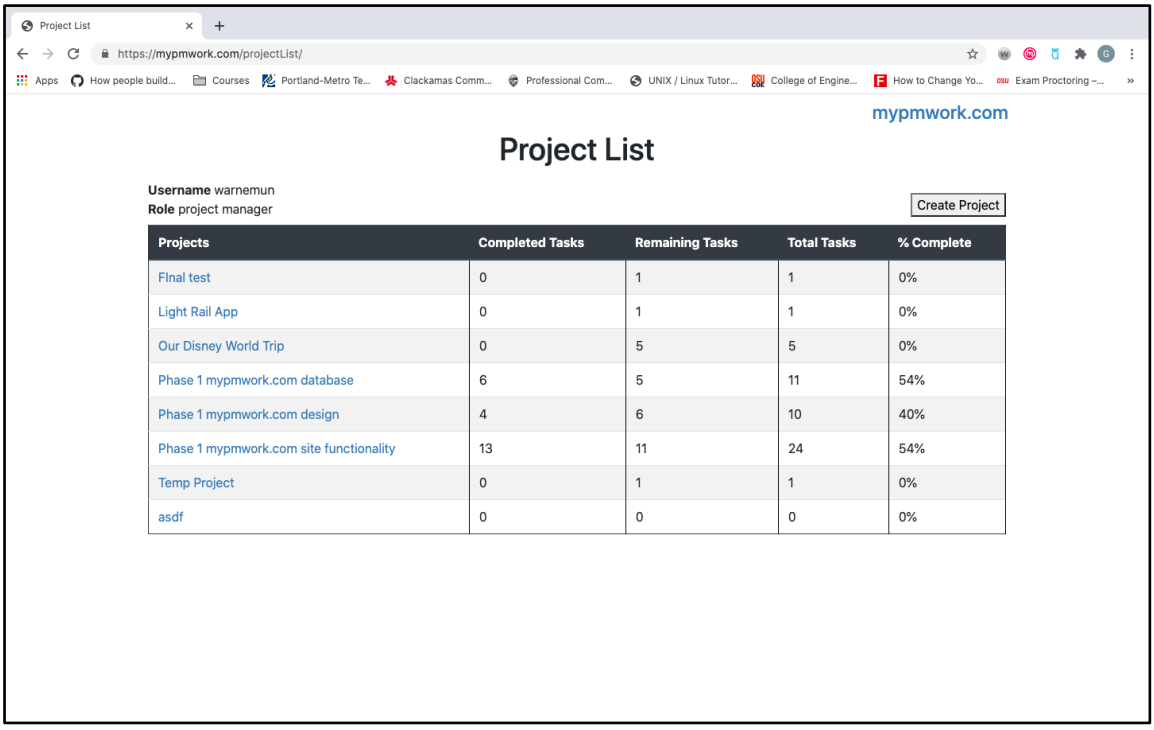
Setup & Usage Instruction

To Start Interacting with the Program:

1. Open a browser (Chrome, Firefox, Safari, or Microsoft Edge) in your local computer
2. On the address bar type https://mypmwork.com
3. Click “Sign in with Google”



4. This will lead you to the Google Authentication process, follow the given instructions of signing in with your google account, and when you are done you should be on the Project List Page

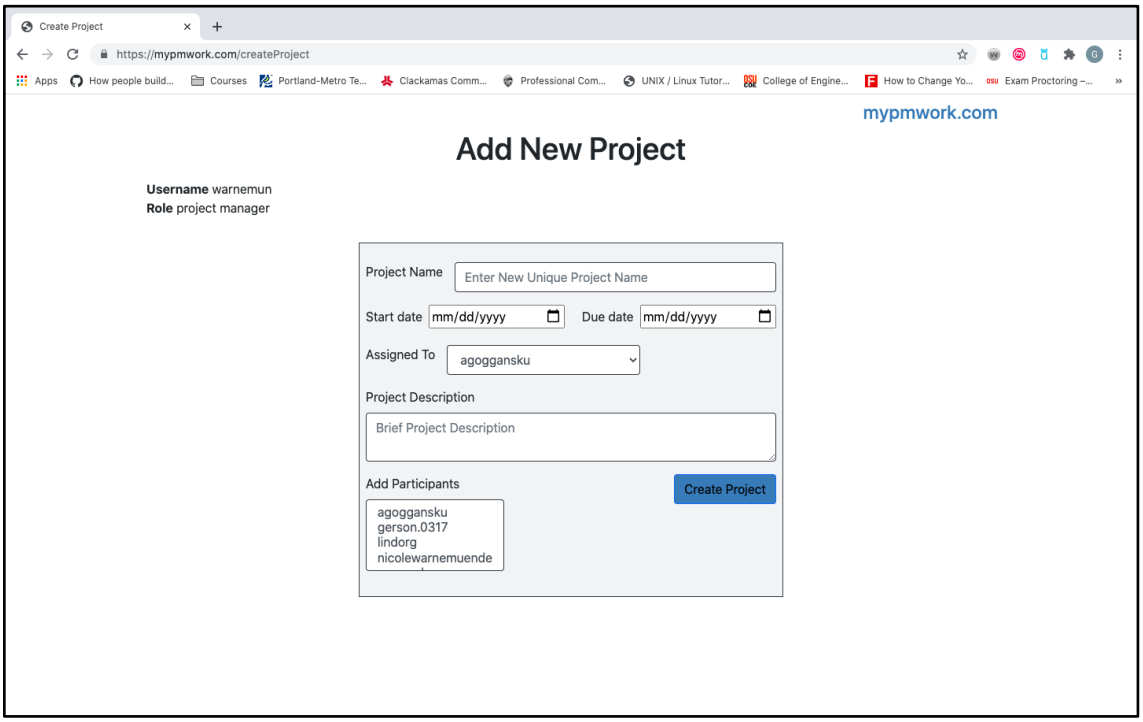


Projects	Completed Tasks	Remaining Tasks	Total Tasks	% Complete
Flnal test	0	1	1	0%
Light Rail App	0	1	1	0%
Our Disney World Trip	0	5	5	0%
Phase 1 mypmwork.com database	6	5	11	54%
Phase 1 mypmwork.com design	4	6	10	40%
Phase 1 mypmwork.com site functionality	13	11	24	54%
Temp Project	0	1	1	0%
asdf	0	0	0	0%

5. If you're a new user, your Perro user account is automatically created
6. If you are a returning user, when you do step 3 of this instruction document, you will be redirected to the Project List Page

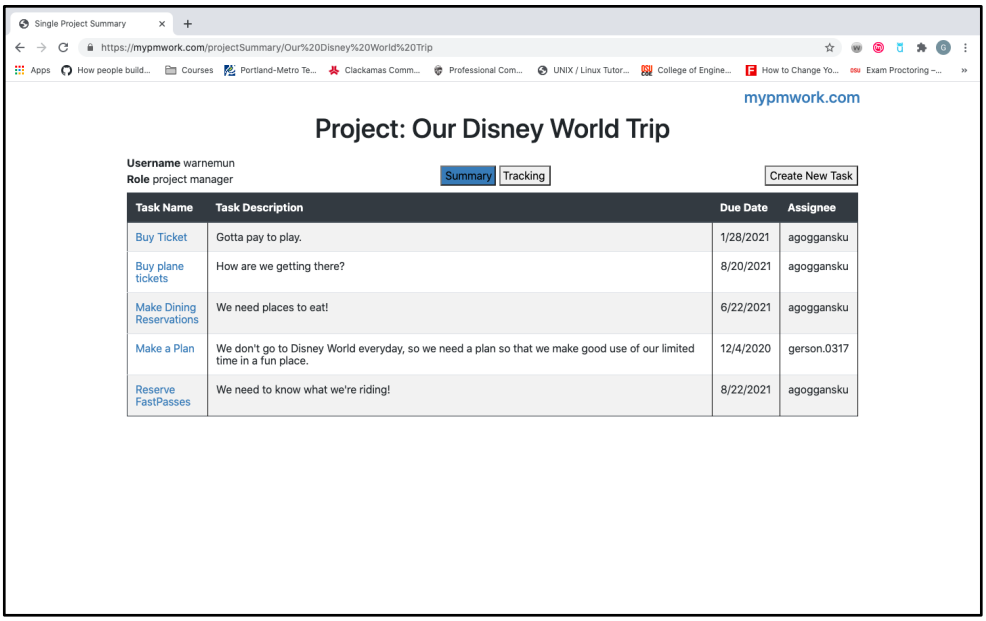
The Project List Page is where a user can view all projects that the user has access to. For the purposes of demonstration, you may see sample projects that populate your Project List UI

7. When it comes to the Project List Page you have the option to create a new project or view an existing project in detail.
8. To Create a new project, click the “Create Project” button
9. Fill out the Form in the Create Project page

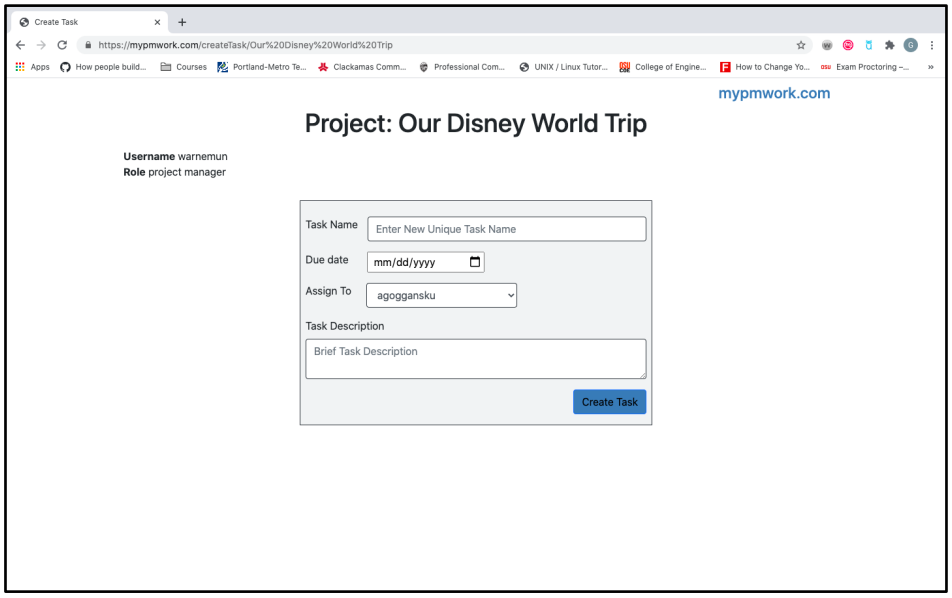


   a. In the “Assigned To” field you can select the users who are project managers because that user will take lead responsibility for that project.
   b. In the “Add Participants” field you can select the users who will be working on the project. To select more than one user participant, just click and drag your mouse over the list of usernames.
10. Click the “Create Project” button
11. You should be directed to the Project Summary Page. The title of this page should be the name of your newly created project.

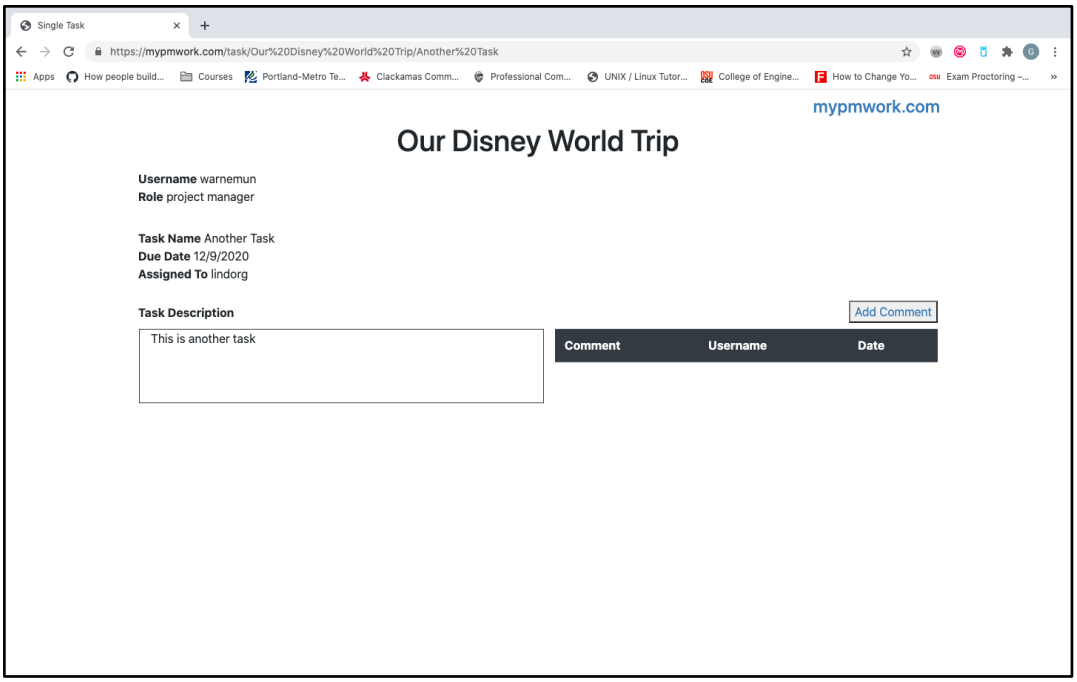
The Project Summary Page is where the user can view and add tasks to a specific project (the title of the page is the name of the project you are adding a new task to).



12. To create a new tasks, on the Project Summary page, click “Create New Task”
13. Fill out the Form in the Create New Task page

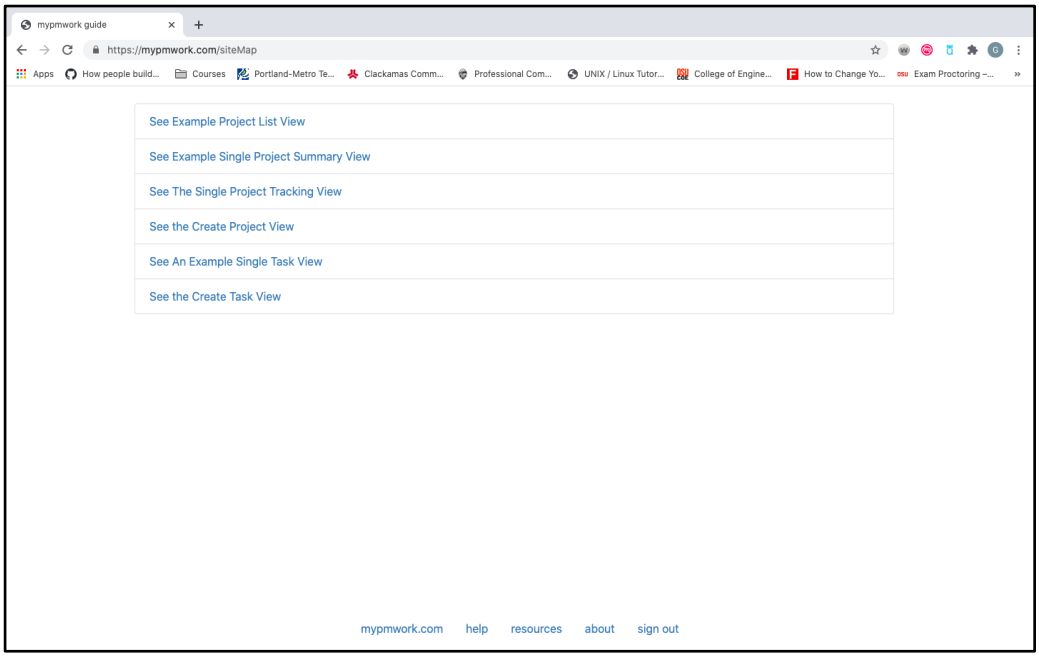


    a. In the “Assigned To” field you can select the user who will be responsible for working on the new task.
14. Click “Create Task”
15. You should be on the Single Task page, and the title of the page should be the name of the newly created task. It is on the Single Task page that you are able to create a comment about the task.
    a. As of 12/4/2020, the comment feature is not implemented

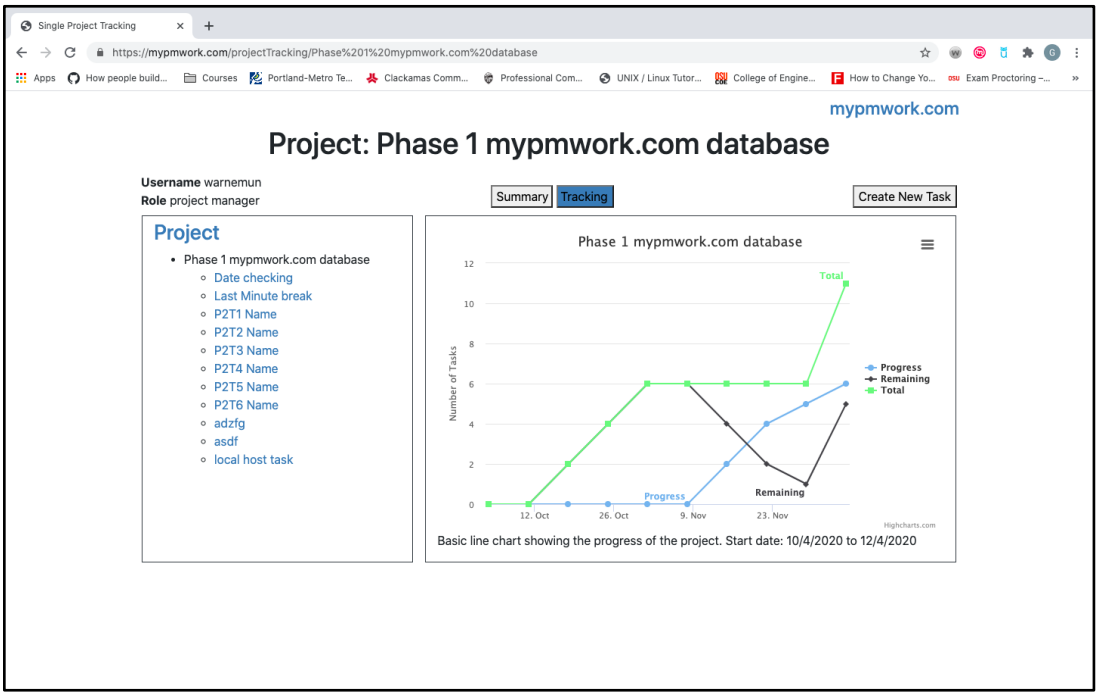


16. On the upper right hand corner of the Single Task webpage, click on the "mypmwork.com" link
17. You should be on the mypmwork guide page

The "mypmguide" page is a sitemap that lists all of the webpages in the Perro web application. You can visit this page by clicking on the following links in the footer: mypmwork.com, help, resources, and about. You can also access this site map by clicking on link, mypmcork.com, which is on every webpage of the application either in the center or the top right hand corner of the webpage.



One of the major features of the Perro web application is the Single Project Tracking view. This page shows a visual representation of the progression status of a specific project using a dynamically generated line graph.



To see this in action do the following steps:

18. On the mypmguide page, click on “See Example Project List View”. This will take you to the Project List page which was mentioned in step 6 of this instruction document.
19. Select any sample project on the Project List under the Project column.
20. You should be on the Single Project page
21. Click on the “Tracking” button in the center of the page
22. You Should see an animation of a line graph being generated for the project you selected.
23. You can repeat step 18 to 22 and select different projects to see different line graph generations.

This completes the instructions for experiencing a general orientation of the Perror Project Management Website. To sign out of the application, click the “sign out” link which is in the footer of the application.

Technology

- The Web application is built with the following web and cloud based technology:
    - **Platform and hosting**: Firebase

- **Database**: Firestore, which is a NoSQL Document based database that allows for easy storing, syncing and querying for web or mobile apps. It integrates easily with Firebase Web applications. There's a user interface to easily create, update, and delete. There's also easy integration with node.js applications.
- **Application Framework**: Express - Node.js
  - Javascript for all the functionality
- **HTML Templating**: Handlebars
- **CSS Framework:** Bootstrap and a little plain css for some added flavor.
- **Login/Authentication**:
  - Google Authentication integration: Google OAuth 2.0
  - Express-Session - to implement session based authentication and authorization
  - Passport.js - to implement google authentication
- Firebase Admin Node.js SDK to enable access to Firebase services in Node.js
- Cloud Functions w/Javascript to serve the dynamic content
- **Local Testing:** Firebase emulators
- **Version Control:** Git and Github

Teammate Contributions and Accomplishments

Team PM was quite a team! With only two members and a big appetite for what we wanted to accomplish we worked together to complete a great phase 1 of an Online Project Management Website. We both came to the project eager to both exercise the knowledge we've gained through our coursework and we've also learned a lot. We entered into the project eager to practice the SDLC concepts, test driven development, agile development, and of course all that we'd learned around building a web application. We were a little too ambitious and as we progressed throughout the quarter, we were flexible and adapted both the expectations for what we would be able to accomplish and when. And we cut out anything aside from getting as much of the app built as possible (test driven development bit the dust like it often does in the real world thanks to tight deadlines). We also worked together when things didn't go as planned. The project plan outlined a more rigid structure and plan, with Nicole focusing on the design and frontend development, and Gerson on the backend and database.

The design work, creating mockups, and building out the front end didn't take as many hours as expected to get it to a good Phase 1, so Nicole was able to pivot and help with the backend functionality in the last three weeks of the project.

Gerson did the heavy lifting of learning, designing and implementing first through python and then in javascript, the firestore database. That foundation allowed Nicole to make adjustments to the database later in the project, including all the test data entered

to meet the needs realized later on. Gerson also did the heavy lifting of learning and implementing the functionality of querying from the database and serving up the data to the frontend, where Nicole had set up tables, forms, and fields using HTML, Handlebars, and Bootstrap templating. Again, the initial work Gerson did, built the foundation that Nicole was able to use to add functionality for the Project Tracking page, where she added the data visualization and functionality and to build out the Task and Project functionality to provide a dropdown of PMs and Users.

And then to wrap up phase one we both worked through a few versions of Google Authentication. As we were making progress, we realized we needed to add authorization and session capabilities to provide protected routes and views specific to the logged in user. This proved to be the most frustrating part of the project. We'd get something working in one way and then hit a wall. And then in the end, when we were both elated to get it working in our local environments, but we realized after deploying the code to the site, that there was cookie/session functionality that wasn't built for production, and this created a setback for phase one. We're just going to have to complete that in a second phase of the project.

Gerson set up our github repository and Nicole set up the Asana project & created mockups. We collaborated on the reports and documentation for the project plan, midpoint check and the final work. We communicated throughout the weeks via slack and one or two zoom meetings a week.

Deviations from Original Plan

When we began to execute our original project plan, we realized that our application needed to be a more user-centered design. We decided to implement the web based app according to how a user would interact with the application and not based on the sophistication of our application's architecture. We wanted our application to promote usability principles with reliable, flexible, secure, relevant, and easy to use functionality. In this section, we list numerous deviations from our original project plan and we reference where in our original document we deviated from. Here are the following deviations:

- In the Technology section (pg 3)
    - Rather than changing to a different data visualization library like Vue.js or D3.js, we chose for the sake of time and simplicity to stick with Highcharts.js which was used in the perro app. It provided an easy implementation without requiring more than an hour or two of learning to implement.
    - For the Firebase platform, we added Passport.js to facilitate the google authentication
- In the Division of Tasks Section section (pg 4 - 6)

    - The Front End work went more quickly and there was more work needed on the backend then possible for one person, so Nicole was able to pivot and help with that in the last three weeks.
    - We changed the order that we tackled the views, adjusting right away to push authentication to the end to allow for a smoother development of the application.
    - We didn't plan through test cases each week, as we needed more time for development. But Gerson put together a few at the end to guide the start of a Phase 2 plan.
    - We also flexed and adjusted as availability varied from week to week. Some weeks less hours were spent on the tasks than planned, while others more than planned.
- We didn't use Asana like we planned. It provided a place for us to plan out the project, practice setting up a project in a PM system and think through what we needed. But we communicated regularly and flexed based on the difficulty of tasks or time available rather than depending on the PM system to guide what we were working on.

Conclusion

We planned to do a little too much than what was possible in the short amount of time, and were not able to accomplish everything. But after completing this first phase of turning the perro app into a fully hosted, database backed application with Google Authentication for a user to enter the app, we concluded a successful first phase. We also are walking away from this phase one of the project with a better understanding of how to plan a next phase, scope the work, communicate and especially how to think through what needs to be implemented to satisfy the requirements of the project.

We were able to implement the user interface with create and read capability of data for tasks and projects. Adding comments, update and delete capabilities, completing the authorization and session work, and adding strict user permission capabilities would be the next phase. Also, taking the test cases included in the final documents will help either us or a next team test what should/is in place and what bugs and functionality needs to be completed next.

We learned a lot, and accomplished a lot, and have built the foundation of knowledge for building web applications using cloud technology, deploying in firebase, with a NoSQL database, and the start of creating a user friendly application to manage and monitor the progress of projects. We learned a lot about the SDLC, how to communicate on a project team, and how to learn quickly to implement a new application.

Final Project Submission List

- Poster
- Mockups
- Demonstration Documents:
    - Mypmwork zipped code file
    - Instruction Document
- Test Cases