

# TODO App

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## ABSTRACT:

This report will go over the problem we are trying to solve, our proposed solution, and the SE process we intend to use. Many students find it hard to manage all of their tasks which is why we've chosen to create a TODO application. This app will allow users to input future tasks and rank the priority for each task. We used the prototype model to implement the solution. The prototype model fit well for this project since it allowed for us to get feedback about our app through prototypes, throughout the length of the project.

## Introduction

Over the recent years, much of the work done by students and professionals has transitioned from in-person to predominantly online and from a desktop or mobile device. This would include both independent and collaborative work. As this shift continues to grow, so does the demand for productivity tools that can be used in tandem with the remote work environment and for personal organization.

Furthermore, the average student has accumulated stress from schoolwork and possibly working a part or full-time job. This along with other commitments, stress the need for organization tools to accommodate their busy schedules. A study shows that about half of full

-time college students have jobs outside of school.

The TODO application has the potential to be an effective solution for these problems. The need to stress and assist in productivity would be much value added for these demographics. An application that could help manage a person's schedule and action items for personal and professional use could have a great demand and positive effect on its users.

## Related Work

According to Neuroscientist Jarrod Lewis-Peacock from the University of Texas Austin, trying to remember multiple things at once will end up weakening some memories and strengthening others.<sup>1</sup> This means that people will not necessarily remember all tasks they have to do if they are juggling many at the same time. The TODO app was designed to mitigate this effect by using software to keep track of tasks needed to be done instead of relying on human memory. Apple tried mitigating the issue by developing an app for the iOS which comes preinstalled on all iOS devices called *Reminders*.<sup>2</sup> While this feature nicely integrates across the apple ecosystem, the app itself doesn't have a tutorial and requires the user to do additional research to fully utilize the capabilities of the software. Another lacking

feature of Apple's *Reminders* app is that while you can schedule tasks to be reminded on certain days, there is no direct way to view the tasks in a calendar like format which can be helpful for organization and visualization. Apple's reminder app has the ability to do Sub-tasks, where a user can group certain tasks. This feature is highly desirable for organizational purposes and should be considered in the design and creation of the TODO app.

One of the main issues when it comes to task management apps is that people do not want to actually start the task because it may be overwhelming. Research conducted by University of Calgary has shown that between 80 - 90 % of undergraduate students procrastinate on their work<sup>5</sup>. To create an effective task management app this issue needs to be addressed in some capacity. It has been shown that the pomodoro technique helps in this regard. The pomodoro technique enables those who procrastinate by making better use of the time they do have left<sup>4</sup>. The technique utilizes a timer where for the duration of the timer a student is focused on completing a certain task. This timer is usually set for 25 minutes. After the timer ends a five minute break occurs followed by another stretch of working 25 minutes. After about four 25 minute and break cycles a longer break is introduced and the process repeats<sup>4</sup>. Having this technique utilized in some capacity within the app will make students who use the app more efficient. Students that will benefit from this design in particular will be computer science students. According to Dr. Stephen Blythe from Lindenwood University computer science undergraduate students spend on average 19-32 hours per week on computer science course work<sup>6</sup>. Introducing the pomodoro technique within the TODO app could prove to be beneficial especially for doing large amounts of work with less burnout.

### **MOTIVATING EXAMPLE:**

In the context of software engineering, our TODO app can be used for project management scenarios. The app has the ability to create tasks with different priorities and this ability to categorize tasks can be used for sprints. For example a software engineering team is creating an Emulator program for emulating old gaming systems. A task like converting SD to HD is set to high priority by the team leader. Team members could see that the task is high priority and that there is a deadline for that task coming up soon. The team could then focus their sprint on developing such a feature. The task would then be moved to in progress instead of not started. When the task of developing code that converts SD to HD is finished, the task status could then be updated to "Completed". Our TODO app can be relevant to Software engineers by helping them work together and complete tasks in a timely manner, but also has the ability to help those who are not software engineers.

### **IMPLEMENTATION:**

Our group chose to use the prototype model for this project. The prototype model uses an approach where a prototype is build and continuously tested and reworked until a final product is achieved. By building an early working prototype of the product this can allow us as a team to explore different functionalities and features with the app. In a TODO app like ours, usability is one of the most important aspects. By creating an early working prototype, this will allow the team to design the app with the end user in mind. Additionally we would be able to mimic any functionality that we anticipate to be done by users of the app and see how well our app responds. In doing this it will allow us to gather feedback early from potential users. Any adjustments needed can be made in real time.

In order to test our product we decided to go forward with a black-box testing approach. We chose to use black-box testing since it will focus on examining the application from an end-user's perspective without going too much into the internal structures or workings of the application. This method aligns with our goal of ensuring that the app meets user requirements and behaves as expected under various custom scenarios. Some scenarios include ensuring a user can log in, adding and deleting tasks and sharing tasks between users. Using black-box testing is advantageous in the early stages of development as it places an emphasis on validating the app's functionality against its requirements. It also allows for inconsistencies, errors in data handling, and UI issues to arise early in the process. This in turn will allow for a very user friendly experience with the final product that has been thoroughly tested.

As for our high level design we decided to implement a layered architecture approach. By having a layered approach we were able to have an approach which will naturally separate the application into sections based on functionality. This meant that we had distinct layers for the user interface, data access and more. This gave us an easy and efficient way to manage the app as well as clean organization of code.

#### **DEPLOYMENT:**

Our group would release our project to be available on both smartphones and web browsers. This would give users better access to the TODO app, which allows for an easier ability to maintain and access tasks. However, before deploying our app we plan to do extensive testing so that we catch as many bugs as possible pre-release. We would mainly do this using unit tests and by using continuous integration. Continuous integration would save us time since bugs won't be committed to the main source code and bugs would be fixed as

soon as they pop up. Mutation testing is also a form of testing that we would likely use for our TODO app. This ensures that our unit tests are effectively testing the source code so bugs don't slip through. Finally once our app is deployed we would still actively test our code and collect user feedback on possible improvements and bugs. From here we would routinely provide updates, but before releasing an update we would go through the same testing process for the updates.

#### **DISCUSSION:**

Our application is neither the first nor will it be the last task management application. As of 5/2/2024, the *Google Tasks* application is the most downloaded task management app on the Google Play Store. On Apple devices, the *Reminders* application comes pre-installed allowing users to schedule notifications and keep track of tasks. On both Android and Apple devices, *Microsoft Todo* is the second most downloaded task manager application. All of these applications including our TODO application allow users to add tasks to an internally stored list and assign due dates for these tasks. Unlike the Google Tasks and Microsoft Tasks applications, our TODO application will provide color coding. When shown a list of tasks, there is no feature in Google Tasks or Microsoft Tasks that enables users to color the blocks containing each task. While this is a small addition, color coding can quickly communicate information at a glance to users. Out of the four task management applications, the Apple *Reminders* application is the only one that allows users to tag tasks with a location. This is a feature we had not considered during planning and one we may implement in the future.

#### **CONCLUSION:**

This application is designed to assist students in maintaining an organized schedule and manage tasks for personal, professional, and academic use. The design of the TODO focuses on usability for the user. The main problem experienced is the current disorganization that is present among college students. Our TODO app with all of its features will fix this issue and help students of all levels stay more organized and on top of their work. The application is equipped with various features for task management and organization. Tasks are organized in the user interface with their respective status and priority. They also have the option to be displayed in a calendar for ease of users to track due dates. The application extends beyond single user task management. An additional feature includes sharing tasks which opens the capabilities of the application to collaborate with other users. The purpose of the application is to increase productivity of the users and keep the users engaged with the interface. The application must continuously receive feedback from the users to implement improvements. This relies on users to remain engaged and relates to the emphasis on usability of the application and its interface. Future efforts will focus on this by considering the addition of features like a study assistant that regulates productivity and break times. Other efforts include implementing a reward system and social media sharing component to share the productivity of users similar to the Strava running application to incite friendly competition as motivation for users and increase use of the application.

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