

Mobile Application for Enhanced Task Management system

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Abstract— Many individuals like working professionals, students, and house makers often find lack of your time and time management as problems for successful task accomplishment. One among the key reasons for failure in task accomplishment is inefficient planning of the tasks. It's vital to seek out a tool that may help in schedule and manage the time, meetings, and appointments. The importance of this project work comes from the requirement of employing a single React Native Application that may be accustomed control many of the operations like tasks, appointments and meetings for people and also for teams and tiny companies. This application uses Flow Time technique for task management. This tool will reduce the buying costs of multiple applications.

Keywords—Task, react native, meeting, scheduling, firebase, Flow Time technique

I. INTRODUCTION

On our day to day work, the amount of time is very precious especially for an employee, where we can't afford time to get wasted on doing unnecessary work, the solution comes with the help of task management tool. Task management is the tool for creating and managing tasks through the project's lifecycle. It includes gathering requirements, planning, status tracking, testing and creating final reports when tasks are completed.

Individuals use task management tools like pen and pad or software tools to organize and accomplish personal goals for every day's chores. Tasks could have status, start date, due date, people who are assigned to work on them, comments, tags and files which are attached to them. More advanced task management systems support dependencies, recurrence, priority, and complexity.

React Native combines the best parts of native development with React, a best-in-class JavaScript library for building user interfaces. React components wrap existing native code and interact with native APIs via React's declarative UI paradigm and JavaScript. This enables native app development for whole new teams of developers, and can let existing native teams work much faster.

The use of cloud computing feature such as firebase which is a product of Google that helps developers build, manage, and grow the apps easily. It is the great solution for developer to build the application faster and in a more secure way. It provides services to Android, IOS, Web and unity.

Flow time technique is a time management method which is invented by Zoe Read-Bivens. The Flow time

technique is useful for creative, developers, students, and everyone else whose tasks require deep concentration. It consists of picking a task, working on it until you get tired, and then taking a break. You repeat the process until you finish the task

This article goes over the detail of native application TaskAtFlow along with the scheduling algorithm. Identifying firebase and react native helps to understand how to create a solution of cost effective and scalable. The real complexity of the solution is in its scheduling algorithm, which divides the user task into a number of sub tasks. It does this by leveraging machine learning and automatically scheduling and rescheduling a day for the user. The scheduling is done based on user preferred time slots, task derived from the pending tasks, and user's progress.

II. EXISTING SYSTEM

In Existing system the task management tool which is a web application uses Pomodoro technique ^[1]. Pomodoro technique is a time management method developed by Francesco Cirillo. The Pomodoro technique methodology breaks down tasks into compact pieces that can be performed in smaller time intervals separated by short breaks.

The technique involves completely focusing on your work for 25 minutes, then taking a five-minute break; repeating this 4 times and going on a longer, 20-minute break after that. The cycle continues until you finish all your work for the day. This technique has a timer which tells user when to start and stop the task and when to take breaks.

The task management tools is a web application which is program that is stored on a remote server and delivered over the Internet through a browser interface. Web services are Web apps by definition and many, although not all, websites contain Web apps.

III. PROPOSED SYSTEM

Pomodoro can be great for tasks you don't want to do or tasks that don't require deep thinking. The problem arises when you have to do something that requires creativity, innovation, and problem-solving. The time frame of 25 minutes is often too short and interrupts your workflow and train of thought. In addition, 25-minute intervals can also be too long for certain tasks. The Flow time technique fixes these problems, as you can choose your own time frames and ensure they align with your workflow.

Flow time technique is a twist on the Pomodoro technique, where instead of having timer for each individual task, the individual person can decide on taking task time and break time. It encourages the user to be in flow state (It describes a period of time in which you're fully engaged and immersed in a task). This technique doesn't have a lot of rules, the most important thing is to listen to your inner voice. Its simplicity is one of its biggest advantages.

TaskAtFlow is a task management solution based on FlowTime technique, which allows users to optimize their day. It is designed using react native which is a JavaScript frame work which is used to develop native application. The most noteworthy aspect of TaskAtFlow is task scheduling. A user simply needs to enter their tasks, a priority (if desired), and a daily schedule is generated for them. The Integration with personal calendars is an important feature of TaskAtFlow.

A. Features

TaskAtFlow gives the following feature:

- Creates and manage task.
- Scheduling automatically and send notification.
- Automatic reschedule of the task if the task is not completed
- View task analytics and data.
- Meeting integration to connects with peers
- Chat room for discussion
- Important documents upload and download
- Personal To-do list
- A timer (for flow time technique).

IV. ARCHITECTURE

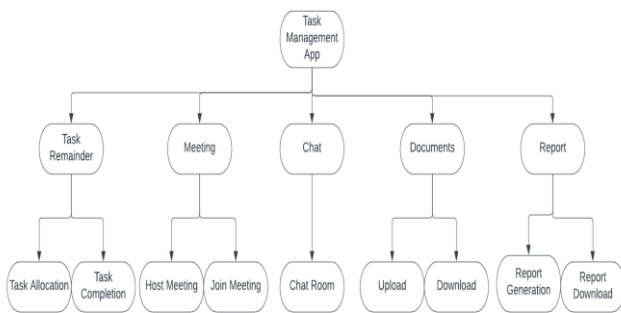


Fig. 1 Block Diagram of the Task Management App

TaskAtFlow is a mobile application which utilizes the framework react native, React native is one of the popular JavaScript Framework which is widely used for developing both Android and IOS app while requiring to develop on one platform. It is also used to develop applications for Android, Android TV, IOS, macOS, and tvOS, Web, Windows and UWP by enabling developers to use the React framework along with native platform capabilities.

The backend of the app uses firebase, Firebase is a product of Google which helps developers to build, manage, and grow their apps easily. The firebase provides feature like authentication, database, machine learning, File Storage

backed by Google Cloud Storage, and hosting. This makes the application suitable for developing under firebase. It helps developers to build their apps faster and in a more secure way. No programming is required on the firebase side which makes it easy to use its features more efficiently. It provides services to android, ios, web, and unity.

The Firebase Real-time Database is a cloud-hosted database. Data is stored as JSON and synchronized in real time to every connected client. When you build cross-platform apps with our Apple platforms, Android, and JavaScript SDKs, all of your clients share one Real-time Database instance and automatically receive updates with the newest data. The JSON format is syntactically similar to the code for creating JavaScript objects. Because of this, a JavaScript program can easily convert JSON data into JavaScript objects. Since the format is text only, JSON data can easily be sent between computers, and used by any programming language.

Firebase Authentication provides backend services, easy-to-use SDKs, and ready-made UI libraries to authenticate users to your app. It supports authentication using passwords, phone numbers, popular federated identity providers like Google, Facebook and Twitter, and more. Firebase Authentication integrates tightly with other Firebase services, and it leverages industry standards like OAuth 2.0 and OpenID Connect, so it can be easily integrated with your custom backend.

The documents upload and download feature uses firebase cloud storage to store, retrieve, and delete the document in the storage. Cloud Storage for Firebase is a powerful, simple, and cost-effective object storage service built for Google scale. The Firebase SDKs for Cloud Storage add Google security to file uploads and downloads for your Firebase apps, regardless of network quality. We can use the SDKs to store images, audio, video, or other user-generated content. On the server, you can use Google Cloud Storage APIs to access the same files.

The meeting feature of the application is used with the integration of zoom SDK to our mobile application. Zoom Meeting SDKs allow new and existing applications to integrate a rich subset of features that are available in the Zoom Client app.

The application provide chat feature where the individual can ask doubts among the co-workers and manager. The feature is established with the help react native gifted chat package. It is the react native package where the components are ready to use in our project. Since firebase provide cloud based message in SDK it is easy to implement.

The most important task is providing the system with scheduling and rescheduling tasks. Scheduling is performed when a user adds new project/task and at the time TaskAtFlow completion. Additionally, the tasks are rescheduled whenever a user makes changes to the integrated calendar. Scheduling and rescheduling of tasks only occurs when user performs certain triggers.

A. Scheduling Algorithm

The scheduling algorithm is the important component of TaskAtFlow. The scheduling algorithm takes care of two action: create new schedule and reschedule task.

Scheduling is done in the following steps:

1. Find empty time slots in user’s calendar
2. Analyse how many task can fit in the timeslot for the user
3. Create entries in database for each of the task
4. Optionally use of machine learning to find how much of the task can schedule in the user time slot.

During step 1 of the scheduling process, the tool creates an object containing free time slots, which include start and end timestamps. Step 2 takes care of generating an object that includes the number of task that can be scheduled in each of the free time slots along with short (5 minute) and long (20 minute) breaks. The final step queries for all the projects and tasks that user is working on, and populates them into the free time slots based on the user specified priority.

Rescheduling happens whenever users decide to skip a task, request more time for a task, or add anew task or a calendar event. Rescheduling is using a variation of the above steps, but additionally it keeps track of how many task it took for at ask to complete.

If the task was skipped, all the subsequent tasks are moved up by one task and the current task is moved to the back of the line. If another task was requested for the current task, all tasks are shifted down by one task and news lot is created right after the current task in progress. When a new task is added to the list, the free slot is allocated for it and task is added to the schedule.

Whenever a user makes changes to the calendar by adding meetings, events, or time off, those time slots are added to the database with a personal tag, which lets TaskAtFlow skip those slots during the scheduling process.

The most difficult part of scheduling is developing the rescheduling code because it deals with moving tasks around existing items. The difficulty is in keeping track of the short and long breaks, along with the necessity of shifting tasks to next/previous day. The start and end times, present in task object, help to mitigate this difficulty, because the fields are used for shifting tasks up/down the schedule without a need to recalculate the start/end times. However, it’s important to keep the work day preferences of the user and number of tasks in mind while updating task objects. When rescheduling occurs the tasks must be accurately shifted to the next day, if current day doesn’t have free time slots. To do that, rescheduling code is verifying that task’s start/end times fall into user’s work day preferences. Additionally, to ensure that breaks are properly assigned, while rescheduling must keep count of tasks updated. This ensures that every task gets a short break and a long break after every four tasks.

B. Comparision of Existing System with Proposed System

The main difference is that the existing system runs on web Application and the current system is mobile Application. The existing system uses Pomodoro technique to set task to user timeline, which has some disadvantages.

- Task that requires longer sessions of concentration or task that are too short work period finds Pomodoro technique applicable for them.
- The timer is consistent interruption that inhibits the ability to get into flow state (flow state describes a period of time in which you’re fully engaged and immersed in a task).

The proposed system FlowTime technique is a twist on Pomodoro technique, where instead of having timer for each individual task, the person can decide on taking interval time and task time. It encourages being in flow state. The advantage of FlowTime technique is

- It reduces disruption in workflow
- It encourages task flow state
- It is more flexible to take breaks
- It is more personalized for users

V. RESULT

The final Android Application developed is intended to reduce the usage of several other application and task management tools. It rectifies the various drawback of using several different applications for each task such as high usage of storage, data, high CPU usage, and etc...

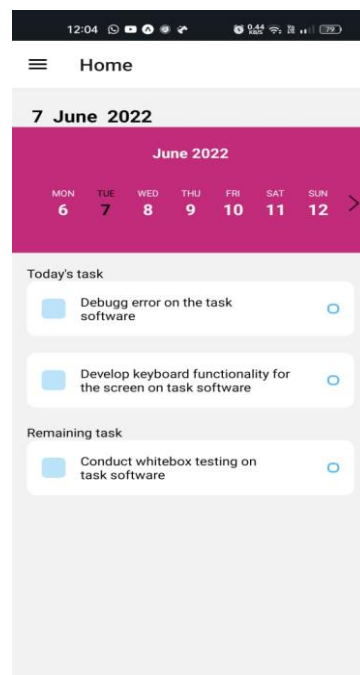


Fig. 2.A screenshot of the final app

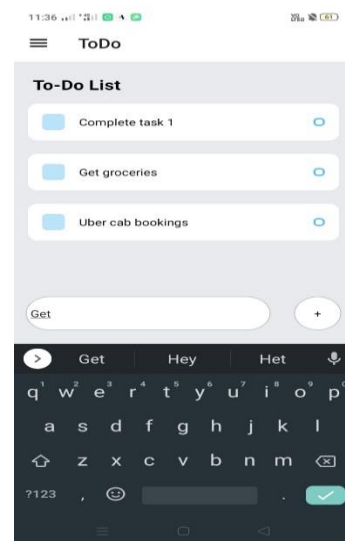


Fig. 3A Screenshot of the personal to-do list

Therefore the objective of the application has been achieved and the result screenshot has been given above.

VI. CONCLUSION

In this work the mobile task management application that helps individuals and businesses to effectively organize their projects and tasks. Using this project as calendar for appointments. Manage projects using dashboards between team members. This project will reduce the usage of using other tool, this makes the application as an all in one application proving the features mentioned. The TaskAtFlow is developed on react native, with interactive UI based system. As this application is developed in react native, the application can run on both android and IOS.

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