

Track Mate – A Modern Era Collaboration Tool

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Abstract—In this modern age, various groups have different day to day needs which need to be collaborated. Collaborating these ideas and thoughts would prove to be very useful and productive for everyone. Track Mate is a collaboration tool to share thoughts and ideas. Users can make groups of different collaborators and give partial or full access to the user. Ideas can be added or removed by different collaborators with the right permissions. Wallet will be present in every group which will track the users balances with each other. This application could be used as a task manager, idea collaborator, balance manager. The applications are endless and is relevant to people in this technology driven era.

Index Terms— Collaboration, Front-end, Back-end, APIs, Progressive web.

I. INTRODUCTION

A progressive web application that is a modern era collaboration tool that helps people to build upon ideas and share those ideas and thoughts with people. Different groups of people can create rooms in this application which reflects upon different groups in their life.

A user must register through their chosen social media platform, like Google, Facebook, or Twitter. Each room can contain users who would have a permission level set upon each room. Admins can manage the permissions and add more users or remove users from a room. Users with add level permissions can add or remove items from a room. Users with view level permission can only see items in a room. Any user can go ahead and create a new room which in itself will contain more users and permissions for each user. Each room can contain different types of items like notes, lists, tables. The wallets can be enabled for a room which will track balances of each user in a room.

Taking an example of an organization with more than a handful of employees, there are tasks that needs to be collaborated on, ideas that need to be shared upon, work that needs to be completed. Having all of these in one platform for an organization and its employees would prove to be useful and productive and help in getting work done.

Each room can contain users of three types. Admin Level User, Add Level User, View Level User. Admin level user has the highest access level in a room, add level User has fewer access permissions than the admin level user which allows the user to add or remove ideas from a room. View level user can only view a room and the ideas contained inside them. Each room contains ideas in formats of either notes, lists, or wallet enabled lists. Notes can be added by the users with the right permissions and can be seen by all users present in the room. Each room can contain as many lists as possible, and each list can contain items which can be added or removed by users with the right permissions. Wallet enabled lists have the same format as of lists, but each item in the list can be tracked with a certain amount. That amount will then get split between the

users in the room and the wallet will be visible in the room for users to take a look at their balances. The purpose of this paper to highlight a collaboration tool to organize ideas and share thoughts would be immensely useful and would prove to be efficient for the users by helping them increase their productivity in their day to day life.

The scope includes a group of people who want to share ideas with each other, and build upon those ideas in a collaborative manner would find this application useful. Any group where the people want to share tasks and track those tasks as the day goes by would also find this application useful. Any organization with a few employees can use this application to streamline their workflow by assigning tasks and sharing the workload would also find this application useful. All this can be accessed by an internet connection and a browser.

II. LITERATURE SURVEY

Our day to day life consists of a lot of tasks separated for ease. These tasks need to be collaborated so that one person does not get all the burden. This leads to the need of collaboration in today's age. Collaborating with other people is immensely useful and helps people finish their day to day tasks with ease.

Collaboration has been a very business-oriented aspect so far. Daily collaboration has still not reached a point where people can collaborate on a platform with ease. Collaboration in the household of regular people will greatly improve their daily lives. Collaboration can also help businesses grow with their employees and clients. It would not only increase productivity but also decrease confusion and miscommunication if the companies had a platform to collaborate directly. Track Mate would prove to be a very useful collaboration tool as anyone with a browser and an internet connection could use this tool to greatly increase their productivity.

The similar feature in Google Keep is a native application developed by Google. This application needs users to be registered with google to use it. Google Keep lets you make different notes or lists. These notes or lists can be shared with other registered users. This application does not have facilities like adding multiple lists or notes in a single note, which can be shared with other users. A user must make multiple notes instead of making a room and creating notes in that room. There is no option to track wallet balance with other users. Users cannot see if there are financial transactions involved and cannot track balances with other users [1].

Other application like Evernote is a desktop application and a web application which is built by Evernote Corporation. This application lets users make notes in a notebook style like folder. Notebooks or notes can be shared with other users who can view other people's notes. There is no option to create a list where multiple people can collaborate to the list. There is no option to track balances of users with each other. Overall it is a notebook which can be shared with other users [2].

Also, Slack Messenger is a native application and a desktop application developed by the team at Slack. This application is a messenger that lets a user create a space that can house other users and more channel. Each channel can be related to specific discussions. This application can incorporate other applications to power up usage of the messenger. Options to create lists or tables that can be shared are not available. This application does not have any facility to track a balance of a user with another user [3].

III. IMPLEMENTATION

This project implemented in the form of a web application which can be consumed by anyone with an internet connection and a browser. It will be developed using the MEAN Stack [4] approach which is developing the client side application in Angular [5] and the back-end will be developed with Express JS library [6] in Node.js[7]. MongoDB [8] will be used for data persistence. All of the end code will be in JavaScript [9]. This application can then further be made into a Progressive Web Application [10] which can be accessed without any internet connection. Developing an Angular client-side application results in a Single Page Application [11]. Since the data is stored in MongoDB, redundancy can be improved by introducing replication in the databases which results in two or more databases containing the same data so the data is never lost or destroyed.

This application could prove to be extremely essential to users of all types. Users could range from people who want to track their day to day expenses and ideas to organizations who want to assign tasks and get productive work done. Track Mate is a very versatile application and could have a lot of use cases in everyday life. Users who use it individually rather than a group, could track the day to day expenses and items that are being bought. This would provide them with an idea of what is being spent in their daily life.

An individual could also use this to help them build upon a project idea in the different aspects a project has. So, if a user is building a project by themselves, they would be able to track all the ideas that come for this project in the different parts of the project so as to keep track and not lose a thought. The users could also be in the form of a group of people who want to collaborate on an idea. They could list the ideas and start building up on them using Track Mate and the features it offers. This would prove to be useful when there are a lot of ideas and a few need to be carefully selected and polished through to get the final product. Users could also come in the form of an organization where there is a team of people working on something. Track Mate would allow this organization to assign tasks to different people in the team so each person has a fair amount of workload and the team lead can keep track of how the people are performing. Each person could have an individual list and the team lead could assign tasks to each person's list so the person would have an idea of what the agenda is for them.

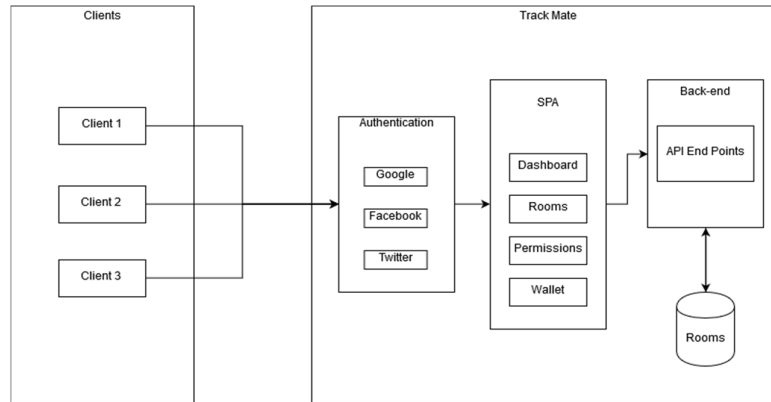


Fig. 1 - Architecture Diagram

The web application has been implemented in the form of an Angular Application and all database endpoints are sent through the express server. Authentication takes place through Google Firebase where a user can sign in via a social media platform like Google, Facebook or Twitter. The user can access the user's dashboard and all the data will be taken from MongoDB with the help of the express server. The rooms data can be fetched too and all operations that are performed on the room will be recorded in MongoDB through the API Endpoints exposed in the express server. All permissions of the room can be managed through the API Endpoints too and all of the details will be stored in MongoDB. Wallet details will start getting calculated automatically and the users can see their balances with the room.

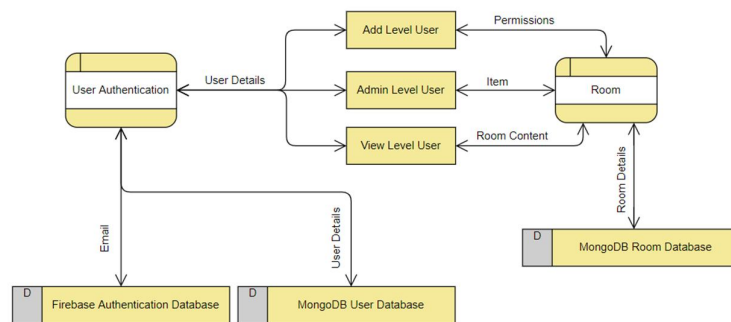


Fig. 2 – Data Flow Diagram

MongoDB has been used in this project for its NoSQL Approach to databases. Track Mate has a lot of data which is not structured and NoSQL Databases would be a perfect match for this approach. MongoDB can be optimized by having an operation affect only one object which reduces the number of transactions in the database. The actual convention is to use references in databases to refer to other objects. Track Mate has been optimized to have all the required data in one object. This would drastically improve DB read/write

times. MongoDB has a restriction of 16 KB per document. This would allow users to store a lot of text. Taking an example, a room that is being used and has a lot of information takes up only 4KB. This means a room can contain lots and lots of information.

IV. RESULT

A complete web application which can be used on any device with an internet connection where rooms can be created for specific purposes. Users can login with a social media platform like Google, Facebook, Twitter for easier access to the application. User details like email address, the user ID, a profile photo and the name will be stored in the backend. All of the authentication will be managed by Google Firebase [12], an authentication service developed by Google. Rooms can be added or removed by users and permissions can be set on a room level for each user.

A user with the right permissions in a room can add or remove another user to the room, thus giving or removing access from the room to the new user. User can add or remove notes from a room with the right permissions and add or remove lists from a room. Individual items can be added or removed from each list in a room. There are two types of lists. Normal list and Wallet enabled list. A wallet enabled list will track balances of a user so each user in a room always knows how much they owe or are owed in the room. Items in a wallet enabled list can be marked as bought and an amount can be added to that item which marks a transaction that will get counted in future balance updating.

V. CONCLUSION

The paper aims to bring the development of a complete web application which can be used on any device with an internet connection where rooms can be created for specific purposes. Users can login with a social media platform like Google, Facebook, Twitter for easier access to the application. User details like email address, the user ID, a profile photo and the name will be stored in the backend. Items in a wallet enabled list can be marked as bought and an amount can be added to that item which marks a transaction that will get counted in future balance tracking.

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