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Daily Mess: Mobile App Initiative to Uplift Mess Halls

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Abstract: Eating on a college campus can be a challenge, especially when it comes to finding options that are both convenient and affordable. To address this issue, we have developed a mobile app called "Daily Mess" which allows college students to easily locate and browse food halls in their area.
The app utilizes the user's current college location to provide a list of nearby food halls, along with information such as distance, price range, and type of cuisine. It is an assistive technology / app that will help local food businesses to increase their customer base and their reach among students.
The app will allow business to register as a local mess hall and have options to edit and change different features of their mess halls in real-time. Overall, our app aims to provide college students with a convenient and efficient way to discover and visit food halls in their community.
Keywords: Flutter, Dart, Firebase Storage, Firebase Real-Time Database, Entity Relationship

I. INTRODUCTION

The food and drinks sector are in dire need of assistive technology that will help college students, blue-collar and white-collar workers find cheap, affordable, home-made food. Developing countries like India has a lot of mess halls that [1] provide good home-made food at very reasonable rates however such businesses have no platform to advertise their food on. Thus, an app like this will promote self-reliance and revenue growth for local mess hall business by attracting interested customers to their business.

A. Flutter and Dart

Google developed the open-source Flutter framework for building mobile apps. It enables programmers to create natively compiled desktop, web, and mobile applications from a single codebase. The programming language Dart, which was also created by Google, is used by Flutter.

Modern and object-oriented, Dart is simple to read and write. It has capabilities for developing mobile apps, including type inference, garbage collection, and asynchronous programming. A vast variety of pre-made widgets and layouts are available in Flutter, and users can even construct their own widgets and animations. Flutter not only provides highly configurable widgets but also superior performance.

It can run at nearly native speeds since it compiles to native code. Flutter and Dart also offer fast development cycles due to their fast and hot reload feature [2]. This allows developers to make changes to the code and see the results instantly on the emulator or device.

B. Firebase

Firebase is a comprehensive mobile and web application development platform created by Google. It provides a range of services and tools for building, managing, and scaling modern apps, including:

1) *Real-time Database:* A cloud-hosted NoSQL database that allows developers to store and sync data in real-time across multiple clients.
2) *Cloud Storage:* A scalable, secure, and cost-effective solution for storing and serving user-generated content, such as images and videos.
3) *Authentication:* A set of tools for managing user accounts and sign-in methods, including email/password, phone number, and social media accounts.

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II. DATABASE DESIGN

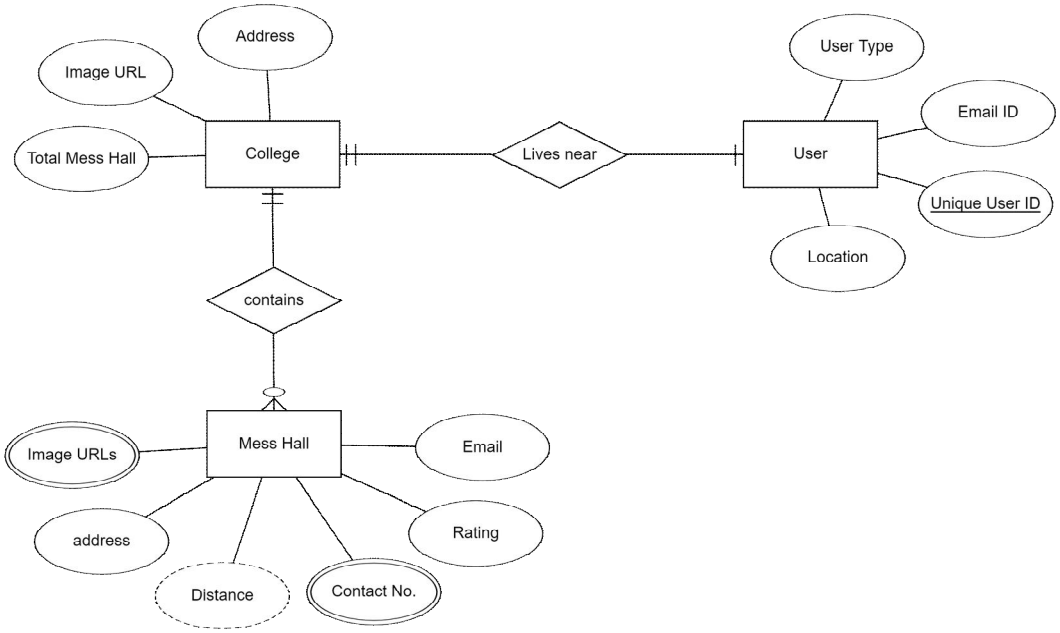


Fig. 1 Entity Relationship Diagram

The whole database can be represented with the help of an entity relationship diagram. The database a has total of 3 entities User, College, and Mess Hall. Every user registered on the app, each with a unique user id has a total of 4 attributes were depending upon the location the nearby colleges will be displayed. Upon selecting a college all the mess halls present around the area will be shown. The entities College and Mess Hall share one to many relationship i.e., a single college can list more than zero mess halls while a mess hall can list under a single college. For mess halls the image URLs are listed as a multivalued attribute since they need to be able to showcase the interior design and seating arrangement of the halls. The Mess Hall entity will also have other attributes such as its address, rating, email ID, contact info and distance from the respective college or location.

III. METHODOLOGY

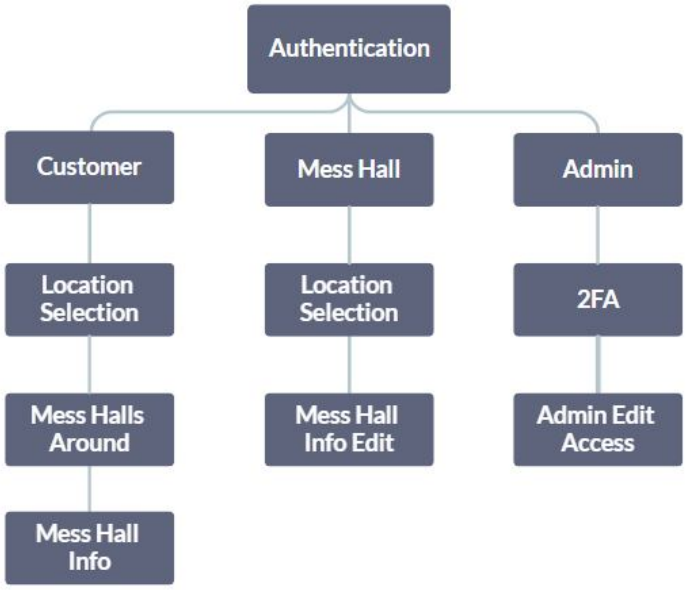


Fig. 2 Methodology of application

A. Authentication

When opening the app for the first time the user is registered on the platform using email ID, for an organization the process is bit different. For a mess hall to register as an organization or business, they will first have to contact app developers, to avoid the use of foul or inappropriate language as the name of their mess hall. For users, details such as their email ID, unique 28-character user ID, date of joining and location are stored in the database.

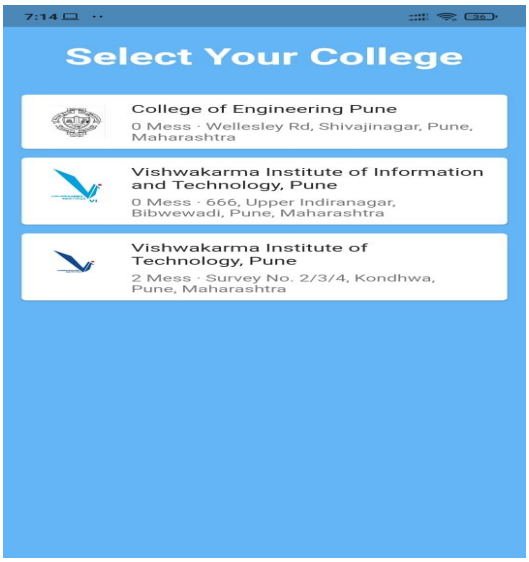


Fig. 3 Location or college selection

If the user logging in is an admin they are prompt with another authentication screen. The admin has access to add/delete new customers and mess halls.

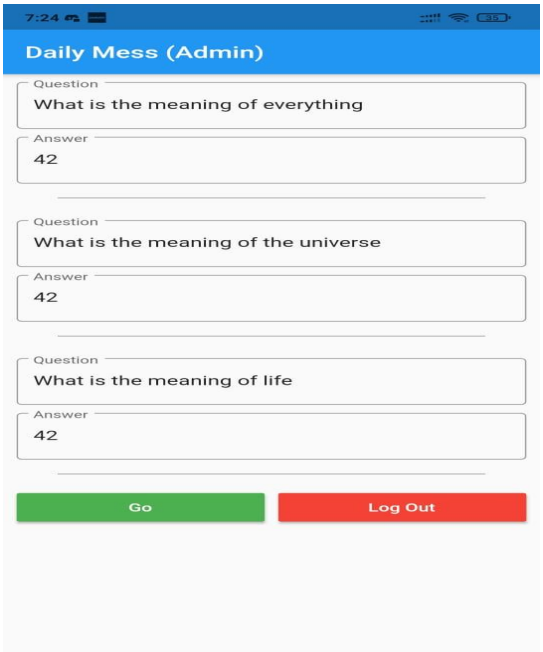


Fig. 4 Two Factor Authentication for Admins

B. Storage and Database

To manage and store all the thumbnail images generated by mess halls Firebase cloud storage is used to reduce the size and resources of the app. Once these images are loaded, they are stored in cache to eliminate the need to reload them again and again for the entire session.

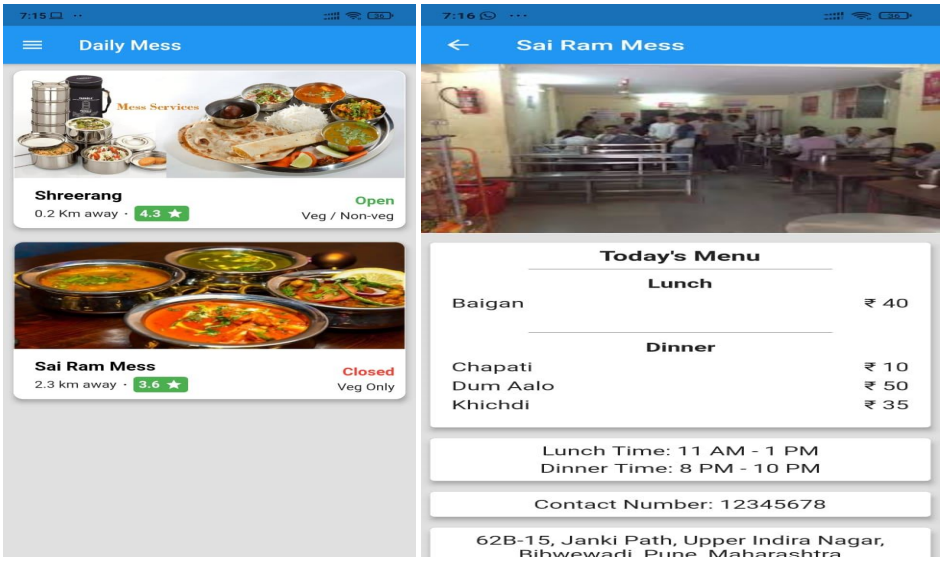


Fig. 5 Mess Hall Preview and Details

All the data regarding the user details, mess hall thumbnail images, menu, opening time, closing time and admin security details is stored in a NoSQL database i.e., in a Firebase Real-time Database. JSON formatting is used to store characteristics of a user like email, user ID, college selected, type of user. If the user is a registered mess hall, then special access is provided to edit their mess hall page i.e., to change the status of the mess, its address, or contact number. Whenever an edit is made all the details are reflected on the customers end immediately with the help of Firebase callbacks.

IV. FUTURE SCOPE

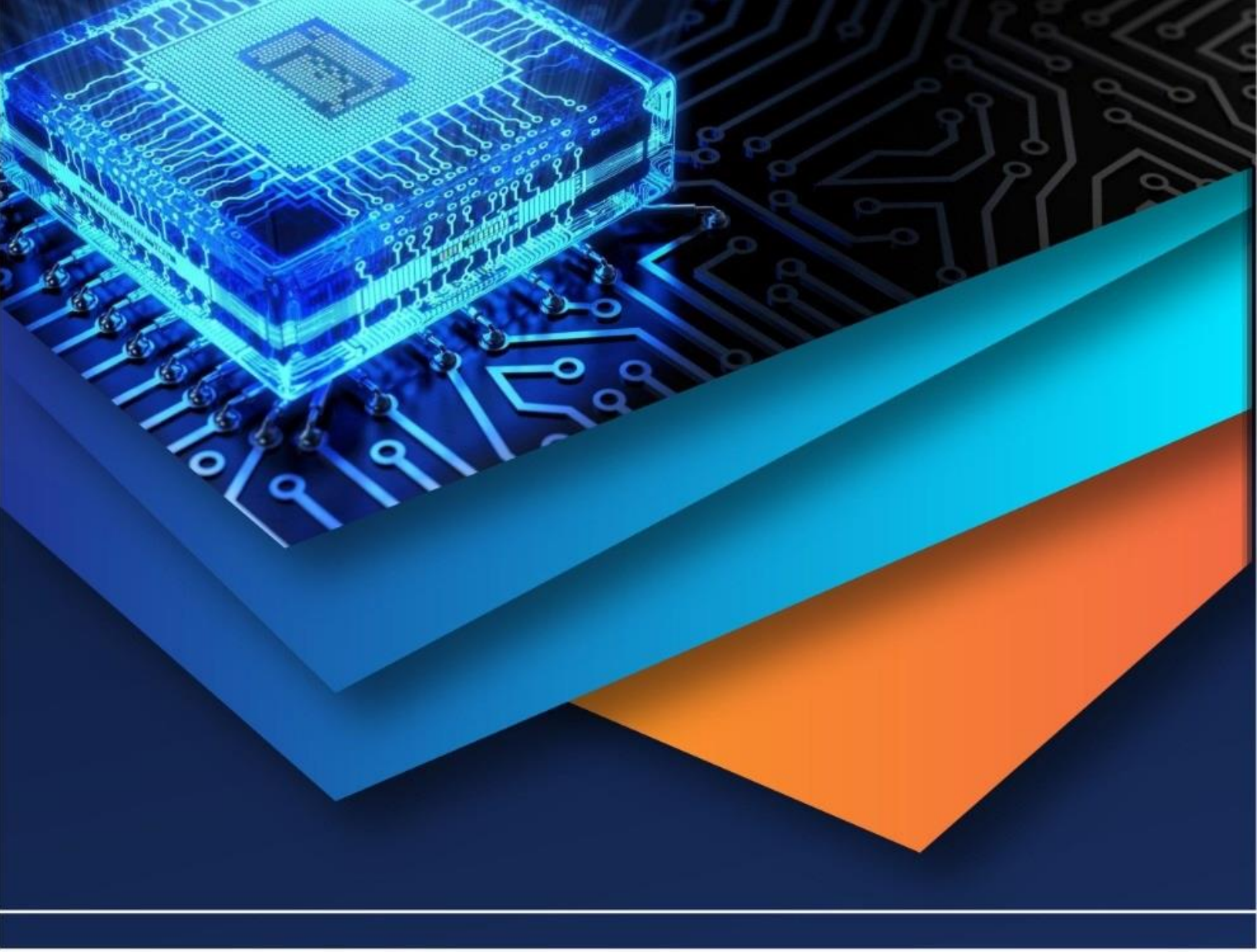
The application can be modified and optimized for smoother experience on lower end devices. Google maps API can be integrated in the system for mess halls to be displayed according to user's location rather than the selected college. Automating the review process of the mess halls and whether the details submitted align within the terms and condition of the application. Using IOT [5], the mess halls can display and change the number of seats available in real-time. A Better version control system can be built for admin to control and manage various other elements about a user or an organization.

V. CONCLUSIONS

Assistive technology like such applications will provide a platform for local mess business to increase their user base. Especially in times of economic crisis like the one seen in 2020-21 [3]. The aim is to provide an income boost to these local businesses and at the same time provide cheaper and variety options for customers. Such an application will promote surrounding mess halls around the college and can also act as a pocket friendly option to students and a change to monopoly over the prices of dishes offered by college mess halls [4].

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