CROSS PLATFORM APPLICATION FOR AUTOMATED CANTEEN SYSTEM

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Abstract : Currently almost all canteens across various colleges follow a very basic paper based or token-based system to take orders from their staff/students. To make this system efficient and error free Canteen Automation System with cross platform application is proposed. The proposed application will be used by staff/students to place orders from anywhere irrespective of the platform on their devices. It enables the users to register online, view and select food items from the available menu and order food by just selecting the food that the user wants to have using the application. The canteen database will be updated after selecting the desired food from the menu card and it will be displayed directly on the canteen screen. The user will have a username and a password which the user can use to log in to the system. Payments for the orders placed can be done online through the application. Once the food is ready the users will get a notification about the same. The system reduces time consumption, paperwork, human errors as it is fully automated**.**

IndexTerms **- Cross-platform application, Flutter, Android app.**

I. INTRODUCTION

In modern days' usage of smart phones has been increased rapidly and a lot of android apps have been developed for managing college day-to-day activities which reduces delay of time and complexity which gives easiness and flexibility. The current canteen system is a paper based system. All the operations have to be performed manually. The customer has to place the order, a receipt will be generated and that receipt has to be given at the counter. The payment process is time consuming. The canteen manager has to store all the records in the registers. It is a time wasting and inefficient process. To overcome these difficulties, the canteen system is automated by building a cross platform application which works on iOS and Android. The cross platform application reduces the complexity of building different applications for different operating systems. The automated canteen application provides an error free and efficient solution to the existing system.

This system aims to accelerate the process of placing orders and ease the system used by the employees to accept customer orders. Different navigations are available in this application such as morning snacks, lunch, etc. Users can select from a variety of available options and its quantity. The ordered food will be visible in the canteen end and once the food is ready a notification is sent to the users. Users can place their orders from anywhere in college. It reduces the workload of the canteen staff and it is also time saving. Management of the automated system reduces the effort and time required in the manual system.

II. PROPOSED SYSTEM

The existing system requires a large amount of manpower and human errors have to be considered while taking orders. Due to these problems the manual system is less efficient. To overcome these limitations, we propose this cross-platform application for canteen food ordering system. Users can simply place orders from anywhere in college and the order will be received at the canteen end. When the customer opens the application, they are demonstrated with an interactive menu. After making a selection, the item is then added to their order, the customer can review the details of their order at any time. The ordered food will be visible in the canteen end and once the food is ready a notification is sent to the user. As the whole process is automated, it reduces the work load on the canteen employees. This system performs and manages all the canteen activities such as placing order, generating bill and making payments. This system manages the details of all the food items such as its name, price, description, image, etc. Customers have an option of paying the amount monthly. The pending amount will be shown to the users in their account. The canteen manager can view the orders and their status will be updated in the canteen database. Customers can check their balance, order history and pending amount. Canteen manager can calculate the monthly sales easily without any manual work.

The automated system is developed with the ulterior motive of saving time. The customer can order the food quickly and it is also efficient for canteen workers because this system takes lesser time as compared to manual or paper based system. Adding a product or managing products in the system is a bit complicated. In our canteen automation system, no complex elements are involved in managing sections; appropriate measures have been taken to nullify the complications so that the system becomes accurate and unique. It also eliminates human error in accounting and item orders. It is a cost effective alternative to the existing manual system. The canteen manager can easily update the canteen database, daily menu and food items, it allows the admin to focus on more productive tasks. It reduces the workload of the canteen staff.

III. TECHNOLOGY USED

3.1 Flutter

There are many cross-platform frameworks that give developers the freedom to develop applications across multiple platforms. Few examples of such frameworks are React Native, Flutter, Xamarin, Cordova, etc. Flutter is a framework designed by Google which provides a platform for cross-platform application development. It allows high fidelity, high performance apps for both Android and iOS operating systems using a single codebase. The Flutter framework is modern & reactive; two features needed in order to build powerful apps with an intuitive User Interface, shared code functionality, and easy accessibility on any mobile platform. Flutter supports hot reloading of an application, in which new versions of the files that were edited at runtime can be injected in a running application. One of the remarkable tools is the hot reload that allows us to view updates in real-time after making changes in the UI. Flutter also supports the IntelliJ plug-in and it also provides debugging, autofill and other similar functions. The toggle platform tool gives developers the opportunity to check the difference between the UI of the iOS and Android OS. Flutter helps to manage the resources properly so that only one codebase is used for both the platforms.

3.2 Dart

Applications built in flutter have to be written in Dart language. Dart is developed by Google, it looks very familiar to Java. Dart can also be JIT (Just In Time) compiled for exceptionally fast development cycles including Flutter's popular stateful hot reload. Flutter supports hot reloading feature used by flutter which is one of the important features. Dart can be used for building the Flutter components. Dart forms the framework code which is then compiled into a native code.It uses the (Android Native Development Kit) ANDK to do so. For iOS AOT compiler(ahead of time) is used to compile the code written in dart. The conventional frameworks do not use widgets but Flutter uses only widgets.

3.3 Firebase

Flutter uses Firebase for backend. Firebase is an app development platform. It provides backend services like cloud storage, real time database, reporting crash, authentication and hosting for your static files. The Firebase Database is hosted on cloud storage. Data is saved as JSON files and it synchronizes in realtime to all the clients. When these cross-platform applications are built with JavaScript SDKs, iOS or Android, the clients share the same instances of database and instantly receive updates with the newest data. Instead of standard HTTP requests, Firebase uses data synchronization, that means whenever the data changes, all the connected device receive that update within seconds. It provides collaborative and fascinating experiences. Firebase applications respond even when the devices are not online because the Firebase SDK preserves the data to disk. Once the connectivity is restored, the client machine receives the changes it missed and it synchronizes it with the present state of the server. We can access the firebase from any web browser or mobile device, an application server is not needed. The Firebase Database Security Rules provides data security and validation.

IV. IMPLEMENTATION

4.1 System Design Workflow

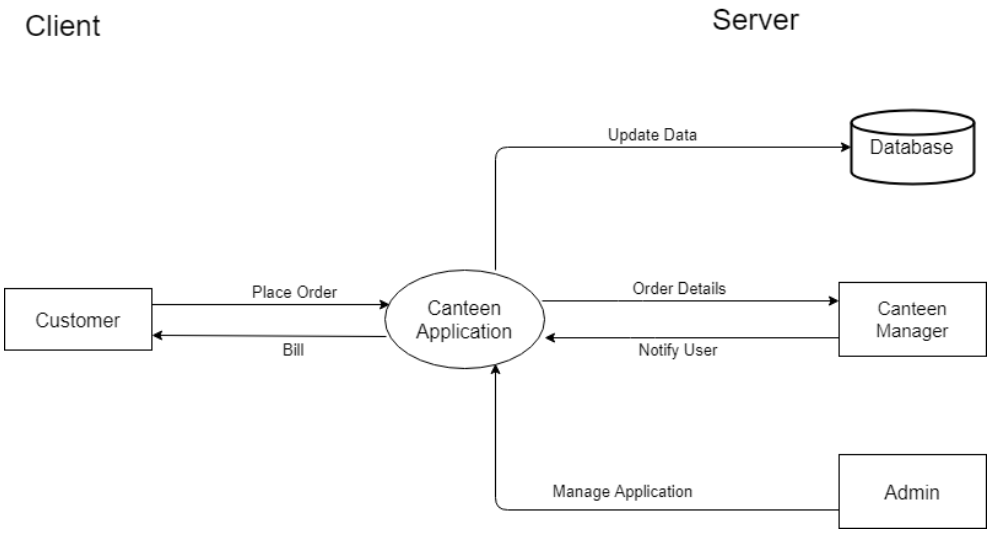

Fig. 1 System Workflow

4.2 Working

4.2.1 Register/Login to the system

Initially, the users need to register themselves by providing their personal details. The user will be provided with a username and a password which he/she can use to log in to the system. After registration, the user can login/logout at any time.

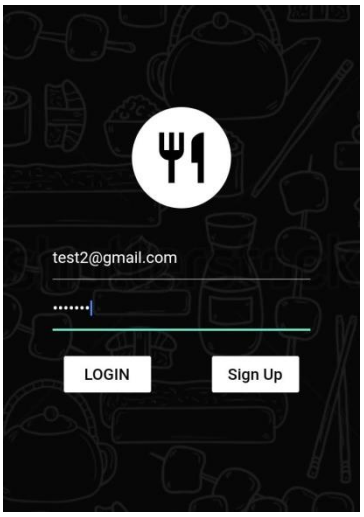

Fig.2 Login Page

4.2.2 Placing the Order:

After making a selection, the item is then added to their order, the customer can review the details of their order at any time. The customers can add or remove any order before confirming it.

Fig.3 Menu Page

4.2.3 Canteen Database

The canteen manager can view the orders and their status will be updated in the canteen database. Once the customer confirms the order, the canteen database will be updated automatically and their respective orders will be received at the canteen end along with the customer's information.

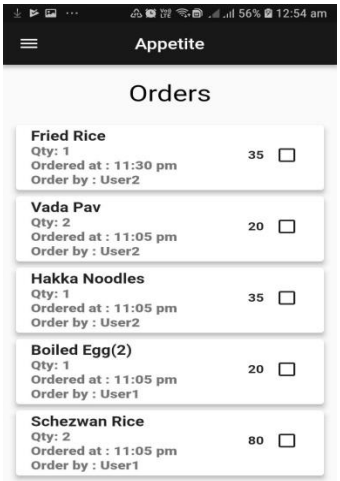

Fig.4 Orders Page (Canteen End)

4.2.4 Order Details

A notification will be sent to the customer when their order is ready. After receiving the notification, the customer can come and collect his order from the counter. Customers can check their balance, order history and pending amount.

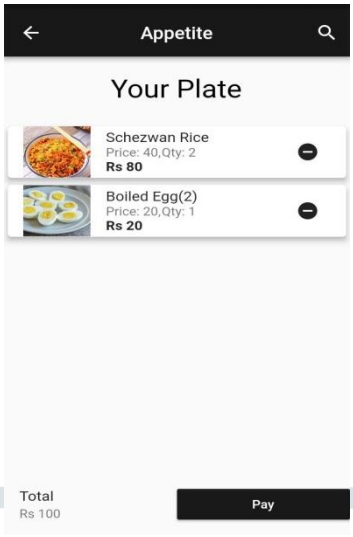

Fig.5 Cart

4.2.5 Payment Process

Once the order is confirmed the specified amount will be withdrawn from their account and a bill is generated. Payment can be done through e-wallet or through cash to the manager. Customers have an option of paying the amount monthly. The pending amount will be shown to the users in their account.

4.2.6 Order History

Customers can view their order history to check their pending amount (if any). It keeps a track of all the current and past orders and their status in the order process. The canteen manager can also view the order history details to find out the most frequently ordered item. These frequent orders will be included in recent orders

V. CONCLUSION

This paper proposes the concept of an automated canteen and targets the services in a college campus. The app can be used from anywhere in the campus. All data accesses are authenticated by providing a valid login credentials. This work can be further improved by adding some unique features to the mobile app remotely and determining frequent orders from the previous data.

VI. ACKNOWLEDGMENT

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