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Foodent Application

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I. Abstract

Nowadays, food ordering has become very common. People are very concerned about their time and the essentials of life like food. Food ordering app helps people to get their food and save a lot of time easily. Most food ordering apps are only available for registered restaurants or food suppliers based on the location. However there is no food ordering app specifically for school students or canteen food providers. This research aims to create an online food order application named ”FOODENT” which is a food order application for students. [12] In busy college canteen, students spend a lot of time waiting in long queues during break times. To solve this problem, we have come up with an innovative solution that is specially designed for our campus canteen. This app serves both the students and the administrators who run the canteen.[1].

II. Introduction

This study aims to reduce the time taken to order food in canteens by eliminating the need to stand in long queues and digitizing the food ordering process. Canteens are essential for students, providing them with food and rest during their hectic academic schedules. However, the canteens in many institutions use a pay-and-use system, meaning that customers have to pay for the items they want and then wait for them to be delivered [6]. This can lead to a lot of wasted time, especially during peak hours, such as breakfast, lunch, and dinner time, when the canteens are busiest. Additionally, one of the most important factors is time, as canteens have fixed intervals, meaning that customers must take refreshments/meals during this time and come back later [5]. During peak hours, when a large number of students rush in to get a quick meal, canteens are often unable to keep up with the demand. This leads to long queues that not only frustrate students but also waste their valuable time that could be better spent on academics or other activities [2].

In this research, we will propose and implement an innovative crowd management system that uses mobile technology to improve the efficiency of canteens [4].

We will use mobile platforms to create a mobile application that is specifically designed for canteens [11]. This app will act as a link between the users (mainly the students) and the administrators who are responsible for running the canteen.

Our goal is to make the ordering process more efficient so that students don’t have to wait in long lines and there is less congestion in the canteen. The solution consists of two main parts: the student interface and the canteen staff interface. The student interface allows students to order food at any time, regardless of the break times.

Administrators receive and process orders only during certain break times, such as the short break between 11:00 to 11:15 am or the long break between 1:15 to 2:15 pm, depending on the time of day. This allows administrators to plan ahead and be ready for the surge of orders, thus reducing wait times and increasing operational efficiency [8].

When students place an order via the mobile app, they have to pay electronically and get a unique token for confirmation. Administrators receive notifications about incoming orders, allowing them to check if food items are available and allocate them accordingly.

If the food order is accepted, administrators accept it and inform the student to pick up their meal at the designated break time [1].

This streamlined process reduces wait times for students and allows administrators to better manage resources, resulting in a more efficient and smoother flow of operations. In addition, the mobile app provides additional features to improve the user experience and improve the communication between the students and the administrators. Students can specify whether they would like to get their orders during a short break or a long break, allowing for flexibility and customization based on their schedules. Administrator scan also update food availability in real-time, providing accurate and real-time information to students placing their orders.

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In short, our research aims to solve the crowd management issues in college canteen operations by integrating mobile technology into the solution. By offering students a more convenient and efficient way to order food, we hope to improve their time management, reduce congestion, and improve the dining experience within their college campus. Ultimately, we hope to help advance canteen operations and create a better environment for academic success and student well-being.

III. Related Work

In recent years, there has been a lot of focus on canteen facilities. Many studies have focused on novel approaches and technology solutions to overcome similar issues faced by college canteen facilities and other providers of food services. In this section, you will find related literature and research that provides insight into crowd management solutions, mobile food ordering apps, and operational efficiencies in canteen settings.

A. Mobile apps for food ordering

Mobile apps for food ordering have become increasingly popular due to their ability to simplify food ordering processes and increase customer convenience.

1) Kim and Yoo, 2016, examine how mobile food ordering apps affect customer satisfaction and loyalty within the restaurant industry. The study emphasizes the importance of easy-to-use interfaces, fast order processing, and smooth payment options to drive positive outcomes for customers and service providers alike.:

2) Chen et al., 2018, examine how college students adopt and use mobile food delivery apps, emphasizing the importance of convenience, dependability, and variety in influencing user preferences [14].

B. Crowd Management Systems

Crowd management is the process of managing the number of people in a space at any given time to keep operations running smoothly and reduce wait times in fast-paced food service settings.

1) Ahmad et al., (2019) propose a crowd management solution for college canteens that uses real-time tracking and predictive analytics to predict demand patterns and allocate resources more efficiently. The system leverages sensor data, historic transaction logs, and artificial intelligence algorithms to predict demand patterns. The goal of the crowd management system is to proactively adjusts taffing levels and improve food preparation processes to reduce crowd congestion and improve customer satisfaction.:

C. Technological Innovations in Canteen Operations

The use of technological innovations in canteen operations has been the subject of several studies. Some of these include:

1) Liu et al., 2017: Using self-service kiosk technology at university canteens, they found that faster order processing and reduced waiting times resulted in improved customer satisfaction and improved operational efficiency, especially during peak hours.:

2) Liang et al., 2019: Using RFID technology in school canteen settings, they found that automated inventory manage- ment systems improved food safety, improved inventory control, and increased supply chain transparency.:

IV. Methodology

The methodology outlined in this research paper is based on a systematic approach to developing and deploying a mobile application specifically designed for effective crowd management in college canteen environments.*Requirement Analysis*

Our methodology begins with an in-depth analysis of the project's needs and goals. This includes the identification of key stakeholders, the needs and preferences of those stakeholders, and the definition of functional as well as non-functional needs for the mobile app. Students, canteen managers, and other stakeholders are surveyed, interviewed, and participate in focus groups to gain valuable information and feedback [9].

A. System design and architecture

Based on the needs analysis, we then develop the system design and user interface design for the student and admin modules of the mobile application.

B. Development and implementation

Once the system design is completed, we move on to the development stage, where we turn the concept design into working software. The agile approach to development allows us to iterate and integrate feedback continuously. We use technologies like Android Studio to build mobile applications, Java to build backend logic and Firebase to manage and authenticate databases in real-time.

C. Testing and Quality Assurance

Quality assurance is one of our methodology's most important aspects to ensure the mobile application is reliable, secure, and performs as expected. We test the mobile application in three different ways: Unit testing, Integration testing, and User acceptance testing. The test cases are used to test various aspects of the application such as functionality, user experience, and compatibility across devices and operating systems.

D. Deployment and rollback

Once the application goes through the testing process and meets the pre-defined quality criteria, we will continue with the deployment and roll-out. The mobile app will be delivered to the Google Play store for Android users in accordance with the submission requirements and app store guidelines. We will work closely with college administrators to get the app out to students and will provide them with the training and support they need to adopt.

E. Evaluation and feedback

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Our methodology will include continuous assessment and feedback collection to measure the performance and usability of the deployed system. Students and administrators will be providing feedback via surveys, usage analysis, and face-to- face interactions to help identify areas of improvement and refinement [7].

F. Iterative Enhancements

Based on the results of the evaluation and the feedback from the users, we will be continuously improving and improving the mobile app to resolve the issues and add new features or enhancements. This process will keep the app up-to-date with the changing needs of users and technological progress, resulting in continuous innovation and improvement of canteen management.

V. EXPERIMENTATION

Our college canteen food application has two main interfaces, one for students (user interface) and one for canteen staff (administrative interface). Students can use the app during college hours to order food at their own convenience. Students can go through the menu, choose what they want, choose the quantity, and then proceed to the checkout. Students can pay for their orders through the app using the various payment methods available. Once the student has successfully paid for their order, a special random token will be generated and shown to the an identifier of their order. At the same time, the app will send a message to your canteen administrator about the order you have placed. The administrator will review the order information and check if the items you have ordered are available. If they are, the administrator will confirm that the order is for preparation. Then, the canteen staff will start preparing the ordered items and update the order status to ”Preparing” in the app[3]. After the food is ready, the administrator of the canteen will send a message to the student indicating the collection time for the following break. The message will contain the generated token which will be used as the verification code to pick up the order. The student will present the generated token during the designated break time to the staff of the canteen. The staff will verify the token and hand over the food items. This process makes it possible for students to place orders anytime during college hours. It also helps the canteen manage orders quickly and efficiently and optimizes food preparation to minimize waiting times. The system works as follows: The user places an order, The admin receives and confirms the order, The user receives an notification via a token, The user presents the token to collect their order during break time, The user interacts with the admin to ensure efficient crowd control and timely food delivery at the college canteen. Let’s see the flow which shows how the user interacts with the admin, from placing orders to collecting food during breaks. It helps to streamline the process for efficient crowd control and timely food delivery in the college canteen setting.
The flow can be adjusted based on specific needs and features of the application.

Basically, This proposed methodology project contains 3 modules :

A. Frontend +Backend using XML and java

Here, for the front part, we have worked on designing the user interface for both the user as well as for admin side in Android Studio by using XML, and for the backend, we have used Java to make the project workable. The user interface for admin and user will contain the following sections :

1) USER:

- Splash Screen
- Start Screen
- Login and Sign up page
- Home or Menu
- Cart
- Search
- History
- Profile

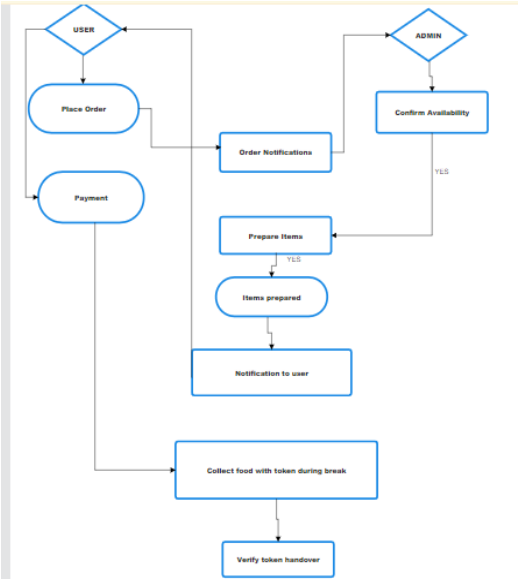

Fig.1.Flowofourproject

2) ADMIN:

- Splash Screen
- Start Screen
- Login and Sign up page
- Home Page
- Add item page
- All item menu list page
- Order Dispatch Page

B. Database using Firebase

Here, we have connected our Android studio with Firebase in which all our backend data are stored accessed, and managed.

C. Payment gateway and token generation

Here, we worked on a token generation program and payment gateway.

VI. Results and findings

The food application has not yet been deployed, but based on the expected results and functions, we can predict the expected outcomes and findings:

A. Anticipated reduction in order processing time

The food application is expected to reduce the time it takes to process orders compared to the old-fashioned manual order- ing system. By enabling students to order online and ahead of time, the application simplifies the ordering experience and reduces the amount of time spent in line during peak times [15].

B. Potential improvement in user satisfaction

We expect the food application to have a positive effect on user satisfaction. By allowing students to order food at their own pace and cutting down on wait times, the app is expected to improve the dining experience and user satisfaction.

C. Expected queue length reduction

With the food application in place, we anticipate a decrease in the number of queuing students at the canteen counter during the busiest times of the day. By allowing students to place their orders remotely and specify pickup times, the app helps spread order pickups more evenly during the break periods, thus reducing the amount of queuing students and reducing the number of queers.

D. Predicted user adoption and usage patterns

We expect to see a lot of student adoption and usage of the food application. The ease of ordering food from anywhere in the world, combined with features like secure payment and notifications, will encourage students to use the app to order food during their college hours.

E. Hypothetical system Reliability and performance

We haven't deployed the food application yet, but we anticipate it will be very reliable and perform well once it's up and running. Early testing and simulations indicate that there won't be a lot of technical issues or system downtime, so you'll be able to enjoy un interrupted service to your customers during peak hours. [13]

VII. Conclusion and Future

A. Conclusion

To sum up ,the food app designed for crowd management in the college canteen is a huge step forward in solving the problems of food ordering and queueing during peak hours. Utilizing mobile technology and cutting-edge features, the app allows students to order food remotely, reducing wait times and improving the dining experience. Integrating real-time notification and order tracking also makes the ordering process easier and better coordinated between users and staff. [10] Early testing and simulations show promising results, suggesting that the app could drastically reduce order processing time and reduce congestion in the canteen. While the app has not yet been implemented, the expected results and functionalities are promising for improving crowd management and improving user experience within the college canteen.

B. Future

Looking forward, there are a few areas where the food application can continue to grow and improve. Future research will focus on testing the application in real-world environments to determine its real-world effectiveness in crowd management and dining experience. Additionally, continuous improvement and improvement of the application's features based on user experience and ever-changing technological advances will be essential. Exploring ways to integrate with cutting-edge technologies such as AI and ML can further improve the app's features and enhance the user experience. In the end, the food application's continuous growth is a testament to our commitment to innovating and innovating to meet the demands of our college and beyond.

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