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Canteen Automation System with Payment Gateway - A Survey

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Abstract: Nowadays people don't have much time to spend in the canteen just there and waiting for the waiter to take their order. Many customers visit the canteen in their leisure time like lunch break and short breaks so they have limited time to eat and return to their respective work. The challenges encountered by manual systems in canteens is efficiency and satisfaction. The ordering of food in most of the canteens is not pleasant for customers since they have to make long queues before placing the order and when the order is placed, they have to wait in the counter until their order is prepared. Another problem is efficiency that food canteens should maintain in their standard operations and keep with the quality of their product and services no matter how much crowd is present in there. Hence the E-canteen would be a good solution for this problem.
Keywords: MERN, online payment, e-menu, order management system

I. INTRODUCTION

The purpose of Canteen Management System is to automate the existing manual system by the help of computerized equipment and full-fledged computer software, fulfilling their requirements, so that their valuable data can be stored for a longer period with easy accessing and manipulation of the same. The required software and hardware are easily available and easy to work with. The organization can maintain computerized records without redundant entries. That means that one need not be distracted by data that is not relevant, while being able to reach the data.

II. LITERATURE SURVEY

Numerous approaches are available which have proposed the different ideas working and processes involved in canteen management system. All of them differ in the technology used to build the system. The major and unique contributions are briefed below:

A. IOT based Automatic Identification, Data Capture and Management

The device RFID is placed inside a tag and involves Time Division Multiple Access and Radio Waves broadcasting over the electromagnetic spectrum.

The interference with other devices gets avoided since the frequency is variable. They are cheap and durable and are not expected to be in line of sight like barcodes either. The best feature of all, these tags can be changed, updated and locked. Cloud computing of the data over the internet has ensured flexibility, scalability, storage and content delivery to be smooth unlike local servers. This management has also successfully handled and achieved the use of resources at maximum and minimum response time and thus the large number of client requests.

B. Android Application and Digital token Based Management

The client side of this system includes an android application which involves high end and complete functionalities like payment gateway and e-wallet. Firebase stores the data required for all the tasks. The token operation has acknowledgment to check if the order is placed or cancelled. The token generated for any order by a user is also notified at the admin end, where an admin can read the order and prepare and notify the user. The feature for cancellation of order from the canteen admin due to any reasons is not available.

C. RFID with user Account recharge-based Management

The main take away from this approach is that the verified user has an RFID number which is connected to his account. The creation of this user account involves pre-paid money and the same is used while ordering the food items. The cloud hosting ensures the safety and the transaction, balance and recharge notifications are sent to verified mobile number. The manager/admin of this system has the permission to fix the price and items of menu, to edit the necessary information related to finance and inventory, to block an RFID and to add or delete the employee details from database. It also has the canteen staff details with their salary, attendance, progress and personal details.

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D. Android Application with XAMPP and SQL Technology

System involves wallet and refilling the same whenever the user wants to order the food items. The remaining system focuses on ordering and provides payment gateway, however there no clue mentioned about the time of order delivery and order cancellation management if any. It mainly provides the facility to handle human errors while accounting the finances.

E. A High end Security and portable Management

The website and app designed to manage the canteen is very well designed to provide security during payments and handles the time difference between order process and canteen cashier. The main feature involves the restrictions applied over the admin by the institution. But, there is not service management for the cancellation of the order that might happen due to any reasons.

F. Full-fledged and Dynamic Database Management

This approach focuses more on sorting and searching of the food item and also on the combo offers or discounts. Over all idea tries to market the canteen food and attract customers on addition to the facility of provision to easy GUI. The system doesn't show hints of an implemented payment gateway but assures the order details display via a printed bill to the user who has ordered. The sales of each day, month and item and finally the total earning summary can be analysed and extracted.

III. METHODOLOGY

This Project enables the end users to register online, read and select the food from e-menu cards and order food online by just selecting the food using the application. The results after booking the food from the E-menu card will directly appear on the screen near the Chef who is going to cook the food for you (user). The system is built using Mongo DB, Express, NodeJS, ReactJS. By using this application, the work of the waiter is reduced and he/she can also say that the work is nullified. The benefit of this is that, if there is a rush in the Canteen then there will be chances that the waiters will be unavailable and the users can directly order the food to the chef online by using this application. The user will have a username and a password, by using which they can login into the system. This implies that the customer is the regular user of the Canteen. The system also involves secure payment gateway and handles cancellation of the order. It also has a teacher/professor section where they can order food directly to their cabins. The chef or the admin who has access to handle the application can edit/add and update the E-menu as per their schedule. They can accept or decline the order received and if accepted must keep the order ready at the stipulated time. They'll receive feedback on their order which helps them to improve if required.

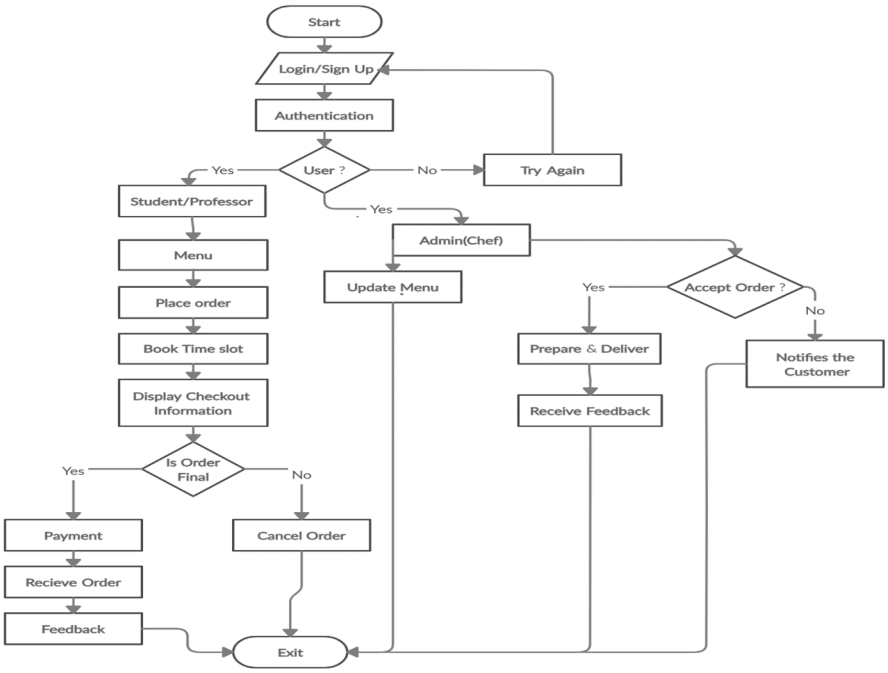


Fig 1. User Flow Diagram

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IV. PROPOSED WORK

Table I
Comparison of different methods used in the process:

Objective	Methodology	Results	Advantage	Disadvantage
Ordering from Menu Card	After Login/Sign up the user can order the food of their choice	E-Menu making ordering simple and easy	Easy to search the items on the menu card with one touch	Late updation of the menu card in some cases
Booking Time Slot	The user will have to choose the time at which they want their food to be delivered	Depending upon the accepting /rejecting from the chef the order will be updated	Remote access to ordering food	Overlapping of orders which may cause delay
E-Payment	Using Stripe the customer can pay for their order	Secure payment is ensured	Prior payment can be made so there is no need to wait in queue for collecting change etc.	Maintenance or glitches in the server may be a concern
Delivery	After being confirmed by the chef the order will be ready for delivery	The order will be ready to be received on the customers booked time	This saves time to the customers as they can collect their orders on time	Too many orders at the same time may cause a little delay

A. *Features*

1) *Load Balancing*: Since the system will be available only the administrator logs the amount of load on server will be limited.
2) *Easy Accessibility*: Records can be easily accessed and store and other information respectively.
3) *User Friendly:* The web application will be giving a very user-friendly approach for all user.
4) *Efficient and reliable:* Maintaining all secured database on the server which will be accessible according the user requirement without any maintenance cost will be efficient as compared to storing all the customer data on the spreadsheet or physically in the record books.
5) *Easy maintenance:* E-Canteen System is designed in an easy way. So, maintenance is also easy.

B. *Applications*

This system can be used in Restaurants, Cafeteria, Etc.

V. CONCLUSION

A fully functional website that enables the user to save time and order food whenever they want without calling the waiter or waiting for anyone else in charge and receive their required food on time. By this way we also ensure social distancing and avoid crowds in the canteen which is the need of the hour.

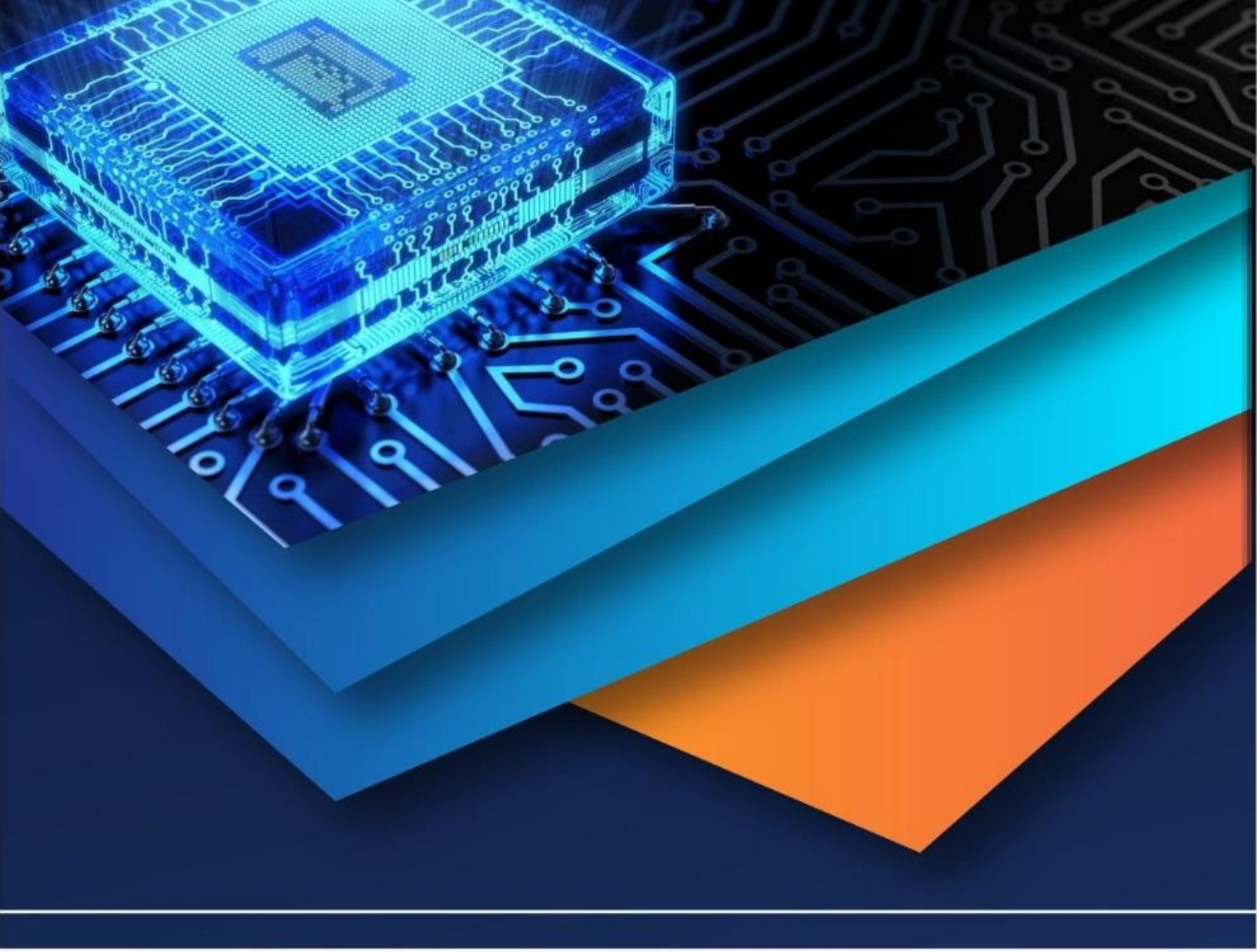
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