

# ANDROID BASED CANTEEN AUTOMATION USING WIFI

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## Abstract:

Now a day with the evolution of digital trend has changed in every sector such as banking, retail, travel, food, etc. Previous services in these sectors are replaced by digital services such as digital and mobile banking, online shopping portal, online travel booking, canteen and restaurant automation, etc. These new digital systems offer a lot of benefits over traditional counterparts, which is a manual system. With rise of digital in every sector, customers preference is digital. Hence to grow customer base in this digital age, every business feels the need to go digital, business trends are changing, and it is moving to digital age. Manual system involves paper work in the form of maintaining various files and manuals.

The important files when maintained manually, there involves a risk. The process of maintaining the data manually is not so sophisticated and interesting. The development of the technology for data handling has opened the doors of the opportunities. The management of the restaurant with the technology is the need of the time for the fast developing countries like India. The project deals with the development of the online platform for the customers and the owners of the restaurant. Managing the task like ordering, billing, feedback and payment is the scope of the system.

**Keywords—** Automated restaurant, Application, database management, Restaurant management, etc.

## Introduction:

With the rise and tremendous success of digital business in last decade every business which can go digital has a huge potential for growth. The successes of these businesses depict the rise of digital age. With customer's preference for digital over traditional counterpart's businesses has a strong potential to grow. By doing online business, the product can be marketed everywhere, and it will reduce the operation cost. The examples of online business are online shopping, taxi booking services, eBooks, food ordering, flight ticket, hotel booking, digital and mobile banking, others. One such business nowadays is canteen and restaurant where more and more

people are willing to spend money on food in restaurants and canteens, so they expect sophisticated system, because of which competition in the catering industry is becoming increasing very fast. These industries need to update with some new innovative ideas or else they will find themselves lagging the others in our society.

The management of the canteen or restaurant is effectively achieved with the help of the system. What happens when the restaurant comes online? We can check the waiting status, whether the table is available or not etc. It will also notify about the waiting time once order is made. The billing and the ordering online will help a lot and reduces the time also.

## I. EXISTING SYSTEM

### A. Traditional Paper-Based System

Most of the Indian restaurants are following this traditional method. Manually one has to write the order on the paper, prepare the bill etc. This system has the problems like:

- This system is paper based and that can get easily lost or damaged.
- There is also wastage of time and paper.
- Even a small change requires the re-print of entire menu-card, also large amount of human efforts is required, and human error occurs when taking order.
- This system is not working properly because it has some error and from a customer's point of view it is time consuming [2].

### B. Radio Frequency Based Food Ordering System

One of the systems is based on RFID or ZigBee protocol. It does not work on the wireless approach but on the principle of the communication between two devices. Despite of the several attempts for improvement, the system works on low speed. When we think of adding the extra nodes the result again worsens.

### C. Computer Accommodated Industry System

A very often used system in India is CAIS. The person has to physically enter the order from a digital device

configured with the computer program. The PC screen present in the kitchen shows the summary of the order received and completed. The problem is if the order is taken, one cannot cancel it even if the dish is not available. Few of the examples of such system are:

### 1. *Personal Digital Asistants Based System*

The online menu ordering gadgets were developed in last decade. The devices are seems to be handy but works on low speeds. The wireless system is popular for use in various restaurants. The number of devices needed during the peak hours is more and hence the cost may not be so reasonable for the small restaurants.



Fig.1: PDA system

The receiving of the feedback is not included in the features of the system.

#### ➤ *Limitations In PDA Based Food Ordering System:*

Even though the PDA based system provided a better option to conventional food ordering system they possess some limitations:

- Requires in more number
- More cost
- No real time feedback
- Only text information
- No provision of the ordering from remote place

## II. PROPOSED NEW SYSTEM

As there are some limitations in all above proposed existing system, to overcome the limitations of above systems, we propose this restaurant automation system based on android technology. This system uses Wi-Fi for communication amongst various component within a system. It is a wireless canteen management system with feature take order, send order, billing and other using android devices. Android devices, in the past few years, have reached the pinnacle of popularity and have revolutionized the use of mobile technology in the automation of routine task in wireless environment. Android is an open-source, Linux based operating system for mobile devices such as smart-phones and tablets. Android has been the best-selling OS worldwide on smartphones. Android has a growing selection of

third-party applications, which can be acquired by users by downloading and installing the application's APK (Android application package) file, or by downloading them using an application store program that allows users to install, update, and remove applications from their devices. Our System present the use of android devices in business applications, namely the canteen management system in restaurants. The Android now has more than 2 billion monthly active devices, this indicates how promising future of android market makes the concept of writing applications for android beneficial and worthwhile. With uses of android is grown to various devices such as smart-phones, televisions, smart-watches, etc.

The functionality of our proposed system is:

- Digital services can boost businesses growth in today's digital age where customer has preference for digital over other approaches.
- Very decent and user-friendly android-based user-interface can add to publicity and gain in customer base and ultimately business growth.
- It adds a speed along with great customer satisfaction (faster seating, faster order preparation, faster turnaround on food).
- Less waiting time as this system provides end user satisfaction during waiting period, such advance feature net surfing, gaming and glamorous environment.
- The system will help to reduce the cost of labor. Reduction in labor will also lead to a considerable monetary saving especially when labor costs are increased to new high nowadays.
- To make more user interfaces friendly and customization for the restaurant owner to update the menu content on the customer devices. This facility can save a lot of marketing money to be spent for business growth.
- Possible human errors in traditional approaches are completely removed, thereby increasing customer happiness. This also reduces waste as when the wrong item is ordered, the food must be discarded. To combine wireless technology and android mobile operating system to automate restaurant management system.

## A. System Architecture



Fig.2: System Architecture

The system architecture depicts overall functionality of the system. It can show how all components combined delivers the expected business functionality. Please see below architecture of Touch and Order in restaurants is shown in figure 1. The architecture attempts at a full coverage of the three main modules of restaurant: The Serving area, the Kitchen, and the Admin cashier counter [5]. The main components of this system are:

## B. System Flow

As per one of the business requirement this system grant flexibility to the canteen manager to change menu at any point in time, so with this system adding a new food item to the menu or changing an price for a food item is couple of clicks away. The restaurant manager will have authority to log into the system and update the menu as per the availability of the dishes. The manager will also advertise the various offers of the day. After arrival of customer in restaurant, select the item from menu tablet then this order is sent to the system over wireless network. The restaurant manager or owner and the kitchen staff will receive the ordered lists from the customer tablet or system. The restaurant owner can update the order status into the system. The customer can also view the order status and he has privilege to change the order. The whole application will already be installed and kept open on the tablets on the tables. Customer who is outside the canteen will book table in canteen or he will give order from his smart phone. Since the system will be available only the admin logs in the amount of load on server will be limited to time of admin access

This system also greatly lightens the load on the canteen's end, as the entire process of taking orders is automated. This is completely automated online ordering of food in a canteen. This system has simple user-interface Admin Panel for creation and configuration of menu groups, menu items, etc. This system has built-in facility to set modifiers on different menu items. After having the food, customer can make payment by online or by cash and enter feedback regarding to that restaurant system facility and services. Canteen Automation System is design as easy way. So maintenance is also easy.

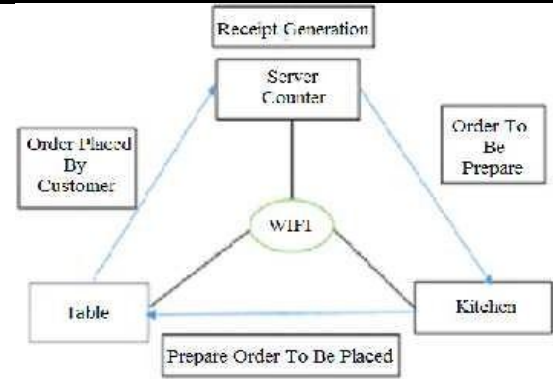


Fig.3: System Design Flow

This project consists of 3 main modules as follows:

### ➤ Customer's Tablet (module 1):

- Tablet is especially made for the use of normal users coming in the restaurant.
- These tablets will consist of the whole menu of the restaurant. The items in the menu are non-editable for these types of the tablets.
- The item selected by touch screen tablet, after finalize order submit towards admin section or unit.
- Customer from any layer of the society should be able to handle and operate all the functions easily.

### ➤ Manager's Web Interface (module 2):

- These desktops are especially for the use of the restaurant manager.
- The manager should be able to control the function of hole restaurant from a single desktop/tablet.
- He can access any tablet and should be able to make changes to the menu and update, add new item in the menu categories.

### ➤ Kitchen Android Smartphone Display (module 3):

- These are present at the kitchen near chef so that he should be able to see what a has ordered.
- All the ordered items are displayed on the screen giving the table number below.
- They should be sufficiently large to be seen by chef at a reasonable distance.
- Chef should be able to notify when a item is ready.

The technologies which are used to implement the system are:

- Android version (Smart Phone) and android version 2.2 – 7.0 for tablets is required.

The software which are used to develop application such as:

- Front end used HTML, CSS, and JavaScript with editor [2].
- Java SE 6 Programming Language id used to develop the software [2].

- Eclipse Indigo is used as a Rapid Application Development Tool (RAD) or as an Integrated Development Environment (IDE) for coding the software [2].
- SQLite is a light weight Database which is going to be used for database access [2].
- JSP/SERVLET is used for Remote Database Access from the main system of the restaurant [2].

### C. System Development

It is an Android based application that gives us best result with ordering a food and real time feedback to customer, Attractive User interface, improve performance, easy to use and gives customer satisfaction.



Fig.4: Screenshot of Different Category

Please find below result analysis Fig. 4 shows, when application is open it shows different category of menu that display on customer tablet.

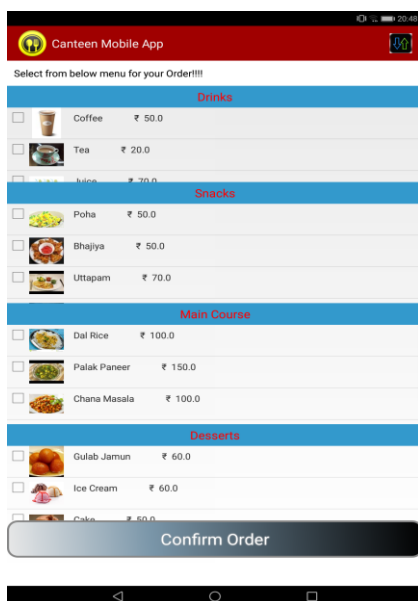


Fig. 5: Screenshot of Submenus

Category of menu expandable in different sub-menus. Submenus contains clickable selected box image of item with name of item and price of item.

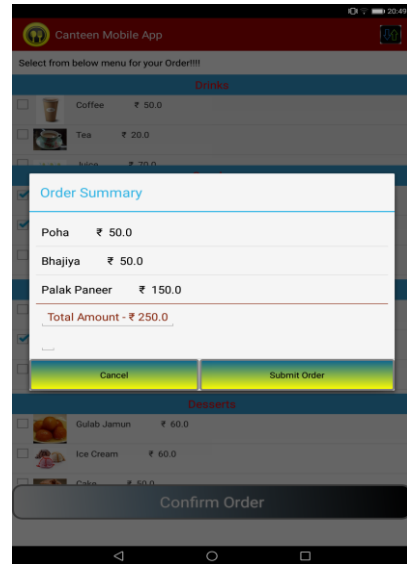


Fig. 6: Order Summary

After finalizing the items from submenu list Fig. 6 shows order summary with total number of item with name and price that displays on popup modal. On popup modal shows total amount count of selected item.

Customer have two options cancel order that order it would be canceled and second option is submit order, that order will proceed to admin cash counter server as well as kitchen display.

Below Fig. 7 shows selected order summary display on kitchen tablet or android device. It summarized as Order Id with table number.

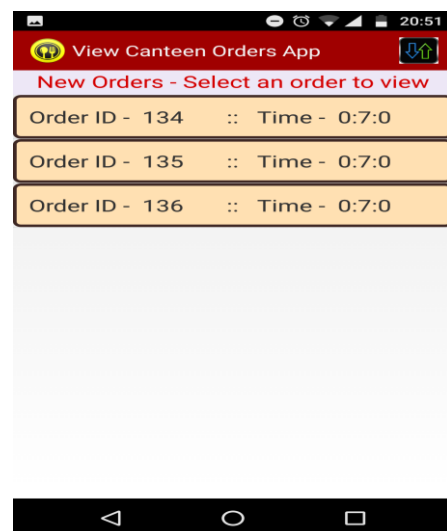


Fig. 7: Selected Order Summary

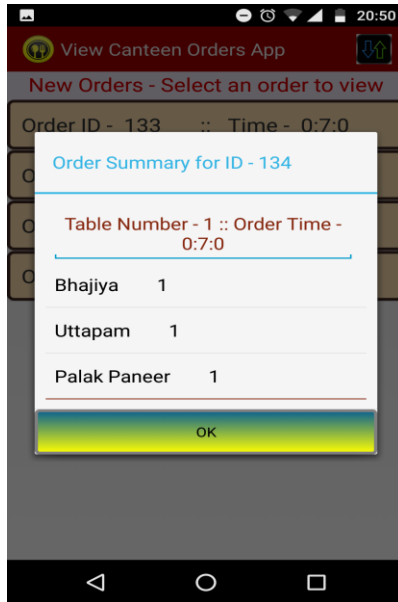


Fig. 8: Order Summary in Details

When kitchen servant selects particular order, it shows order summary in details with order id, table number, item with quantity. When order is making then it's time to proceed checkout. Checkout process with billing that would be done by admin or server site.

#### D. Result

The aim achieved by this project is to automate and simplify a Canteen's business processes using widely used android technology. This system offers high speed services with less memory consumption(3.8MB) and very attractive user-interface. The use of open source technology such as Android, Java, MySQL Html, and JavaScript reduces overall system cost. This system has attractive user interface which can boost customer experience and business growth, It is also very easy to use and gives business growth and customer satisfaction.

### III. SYSTEM TESTING

To builds up our project we use software testing process for executing a program with the intent of finding errors that is uncovering errors in a program makes it a feasible task and also trying to find the errors in a program. As it is a destructive process.

#### A. Type of Testing

The We just mentioned that how the testing is related to this software and in which why we have test the software? In our project we have used 5 types of testing these are listed below:

- **Unit Testing:** Where individual program units or object classes are tested. Here by using this testing we have focused on testing the functionality of methods.

- **Module Testing:** Where this is the combination of unit program is called module. Here we tested the unit program (5-6 programs) is where the module programs have dependency.
- **Sub-system Testing:** Then we combined some module for the Preliminary System Testing in our Project.
- **System Testing:** Where it is the combination of two or more sub-system and then it is tested. Here we tested the Entire system as per the requirements.
- **Acceptance Testing:** Normally this type of testing is done to verify if system meets the customer specified requirements. After submitting this project to User then they tested it and to determine whether to accept application. It is the system testing performed by the customer(s) to determine whether they should accept the delivery of the system.

### IV. CONCLUSION AND FUTURE SCOPE

This system is convenient, user friendly, effective and easy thereby improving the performance of restaurants. This can boost the businesses growth due to very attractive user interface and better service offerings. It will also provide quality of service and customer satisfaction. The prototype with the help of the software is developed and presented by the authors. The Android and wireless system combination has made it possible to develop such a useful, low cost and fast operating system.

In future, work can be done on providing online food ordering and order tracking capabilities along with provision to make different types of payments like credit & debit cards, Google pay, apple pay, online banking, etc. The system can be further extended to support multiple restaurants and food chains to enhance the dining experience of customers [5]. This system can be provided as a service to different food chains and restaurants as a cloud service, where restaurant owner pay for service usage rather than traditional onetime payment for software.

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