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RESEARCH ARTICLE

Implementing Digital Restaurants and Inter-Restaurant Navigation Using Smart Phones

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Abstract - The Rapid growth of wireless technology and Mobile devices are creating a great impact on our lives. The aim of this research is to automate the food ordering process in restaurant and also improve the dining experience of customers. In this paper, we discuss about the design and Implementing Digital Restaurants and Inter-Restaurant Navigation using android technology. In this system we are providing dynamic database utility which retrieves data or information from centralized database. The android application in tablet contains all information about restaurant and menu details. All communication between the customer tablet, kitchen display and the cashier counter is done through Wi-Fi technology. This application is user-friendly. It improves efficiency and accuracy for restaurants by saving time, reducing human efforts, providing customer feedback and accepting different types of payment like cash, credit card, debit cards, etc. System connects the multiple restaurants to provide the services to customer. The main aspect of our paper is to navigate the all the places in restaurant and providing direction to customer.

Keywords - Smart phone, Android application, Wi-Fi, Android Mobile, Dynamic database

I. INTRODUCTION

Now a day, all systems are managed by computer. Also all business transaction, billing system, inventory system are managed by information and communication technology (ICT). The rapid growth in information and communication technology (ICT) has greatly affected the business transactions. With increasing use of communication technology emergence of wireless technology and android devices has created quite mobility in the business transactions. The rapid growth of wireless telecommunication and the network lead industries

that are gaining more customers every day. Providing fast services to customer within less time and also reducing human efforts is aim of all computerized system.

The restaurants have to provide the best services and maintain relationships with their customer in order to survive in this competition .In any restaurant food ordering was a completely manual process when waiter takes order from customer he should write down the order on piece of paper and then enter it into a computer .The order is then taken to the kitchen, bring the food and make the bill. Although the current system is simple it requires a lot of time as the waiter keeps going to and from the customer. It also requires investment in purchase and storage of paper, wastes a lot of paper. Large manpower required and also is prone to human errors and time consuming.

There can be a provision of membership for regular customer. System provides the recommendation related with menu. There can be a provision for customer, if suppose customer want their order after some time then it will provided on that time. System also provides menus as per age of customer. If customer wants recipe of any menu then our system provide that facility.

A Digital Restaurants and Inter-Restaurant Navigation Using Smart Phones system has been designed and developed for be used in food court. With this system customer can view the latest meal menu and send order using their smart phone or tablet. The tablet will interact with server in the food court through wireless connection.

II. LITERATURE REVIEW

➤ CONVENTIONAL PAPER-BASED SYSTEM:

One of the most widely used food ordering system is the conventional paper based system. In this system all records are stored on paper. The main drawback of this system is papers can get easily lost or damaged. There is also wastage of money, time and paper. Paper-based systems do not provide any form of dynamicity. Even a small change requires the re-print of entire menu-card. Also large amount of human efforts are required, this system is not work properly because it has some error and from a customer's point of view it is time consuming.

➤ INTRODUCTION OF COMPUTERS IN ACCOMMODATION INDUSTRY:

First waiter takes the order from customer. After taking the order, waiter should enter that order in system where PC was set up. At the kitchen information was displayed on screen. The kitchen staff would then prepare the dishes according to order and after completion of order they would inform to waiter, who collected and delivered the dishes to the respective tables. The system was also informing the waiter about the availability of a dish. If a certain dish was not available then waiter was able to ask for changes or even cancel a customer's order. After serving the order, bill was generated at the cash counter as per customer order. The management had full authority to access all details of the customer which are fed into the system.

With the improvement in the computer and communication technology, various systems were launched in market for the purpose of computerization of the food ordering system. Some of the existing systems are mentioned below:

A. PERSONAL DIGITAL ASISTANTS(PDA'S) BASED SYSTEM:

A number of wireless systems like WOS, i-menu, FIWOS were developed when new technologies and approaches being introduced to automate the food ordering process. All the above systems were PDA- based. The feature of PDA systems was that customers or waiters key in ordering process. Using wireless technology there was easy communication between the PDA's and server. But PDA based system also had several drawbacks. PDA-based system increased the restaurants expenditures. PDA systems also did not provide any real time feedback from customers. Menu cards in the PDA's were not attractive and uninformative as it did not support images.

B. MULTITOUCH TECHNOLOGY:

Multi-touch technology is an advance version to the existing touch technology where user has authority to control and perform operations concurrently on the electronic visual displays using multiple fingers inputs. Large displays such as from the tabletop and the wall-screen are deemed to be essentials for information visualization purposes

when dealing with multiple users sharing the same display. It is reported that the social interaction is highly improved among users using a shared display and input. But there are certain limitations of the multi-touchable restaurant management systems. Touch screens available in the market are of capacitive, resistive types which are very costly. Limitations of capacitive touch screen are not able to operate with stylus until it is of conductive material. One more disadvantage of capacitive touch screen is it is expensive, offers less durability and short life. The drawbacks of resistive touch screen include its inability to support multi-touch gestures, its poor visibility in direct sunlight and its less durability. The technology can be susceptible to data-noise, it may be affected by large amounts of dirt and dust in the environment.

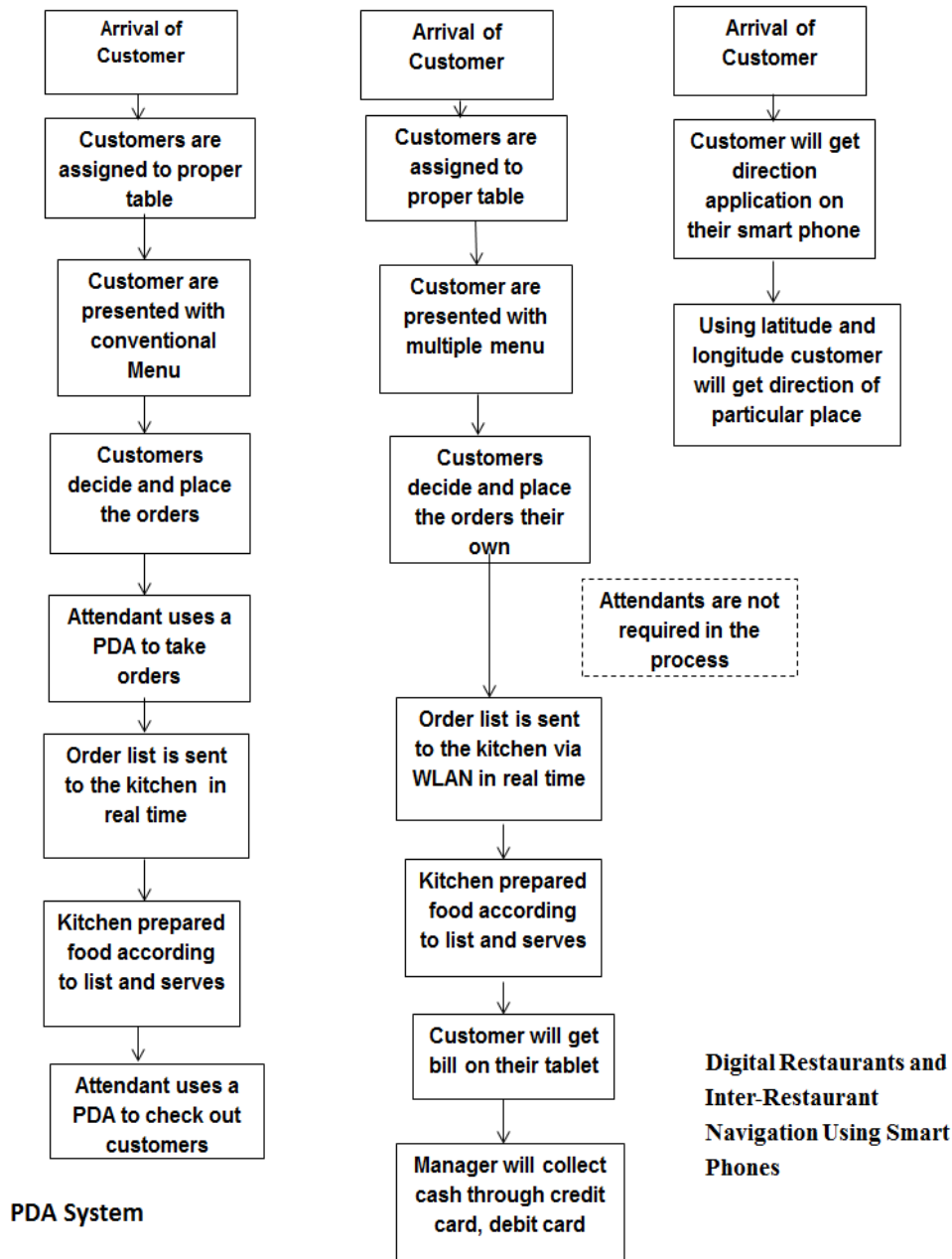


Fig 1:Difference between PDA System and Digital Restaurants and Inter-Restaurant Navigation Using Smart Phone

III. PROPOSED WORK

To overcome the limitations of above system, we propose digital restaurants and inter-restaurant navigation using smart phones. It is a wireless food ordering system which is based on android devices. Android smart phones attract both the general and commercial users. Android devices have gained massive popularity and have innovated use of mobile technology in the automation of routine task in wireless environment. Android is a Linux based operating system for mobile devices such as smart-phones and tablets. Location Based services using Android OS Motivated by the use of Android mobile OS in Health and other applications, we present the use of Android Devices in Business applications, namely the food ordering system in restaurants. Considering the promising future of Android market, it is beneficial and worth to write applications for android that target mob of people.

The Objectives of our proposed system are:

- To combine Wireless technology and Android OS to automate food ordering process.
- To minimize the imperfection in conventional system by reducing the working of a restaurant.
- To make provisions for obtaining feed-back from the customers and provide the restaurant a means of review of their service.
- To automate food ordering system at Amardeep Restaurant that can eliminate or minimize the current problems in conventional system.
- To utilize wireless communication and smart phone technology in implementing the automated system.
- To make more user interfaces friendly and customization for the restaurant owner to update the menu content on the customer devices.
- To enable real-time feedback between the restaurant owner and customers on the order status.

SYSTEM ARCHITETURE

The system architecture of digital restaurants and inter-restaurant navigation using smart phone is shown in figure 2. The architecture includes the three main areas of restaurant: the *Server*, the *Kitchen*, and the *Cashier counter*. Conceptually this system is built using following components:

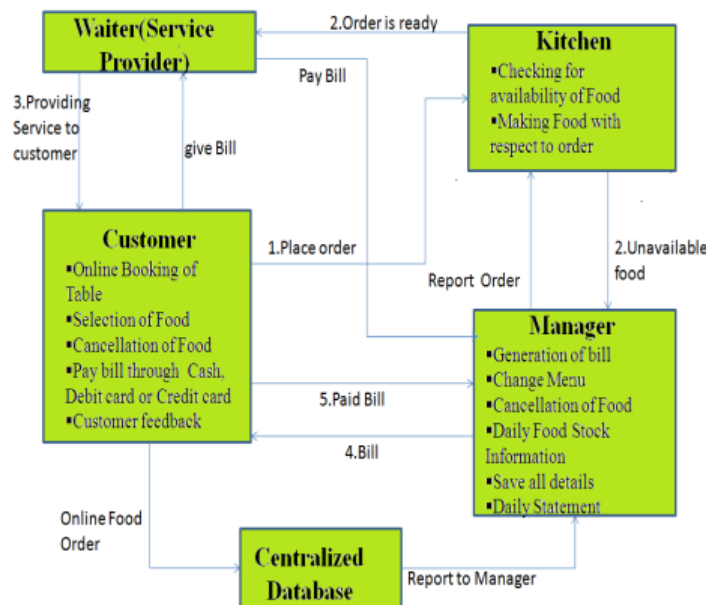


Fig 2: System Architecture

SYSTEM DESIGN

The restaurant owner or 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, he or she select the information and menu from 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 authority to cancel the order. The whole application will already be installed and kept open on the tablets on the tables. Customer who is outside the restaurant will book table in restaurant or he will give order from his smart phone. The turn-off or shutdown option of the application will remain disabled for the customers i.e. the customers can not be able to turn off the application and do any other work on the tablets. After having the food, customer can make payment by online or by cash and enter feedback regarding to that restaurant system facility and services. Customer contact number will be saved in database for sending message about next offers.

This project consists of 3 main modules as follows:

- USER TABLET(module 1)
 - This type of the tablets 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.
 - They will be enabled with the Wi-Fi connectivity.
 - Customer from any layer of the society should be able to handle and operate all the functions easily.
- MANAGER'S TABLET(module 2)
 - These desktops are especially for the use of the restaurant manager.
 - The manager should be able to control the function of whole restaurant from a single desktop/tablet.
 - He can access any tablet and should be able to make changes to the menu.
 - Also he can change price of particular item or disable particular item which is not available at that particular time.
- KITCHEN DISPLAY(module 3)
 - These are present at the kitchen near chef so that he should be able to see what a particular 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 particular item is ready.

SYSTEM SPECIFICATION

The technologies which are used to implement the system are:

1. Android version 2.2 or more for Tablets is required. We have used Android 4.2 Jellybean as the working platform to develop this application.
2. Java SE 6 Programming Language is used to develop the software.
3. Eclipse Indigo 2.4.1 is used as a Rapid Application Development Tool (RAD) or as an Integrated Development Environment (IDE) for coding the software.
4. JSP/SERVLET is used for Remote Database Access from the main system of the restaurant.
5. SQLite is a light weight Database which is going to be used for database access from the tablet.

V. CONCLUSION

In this paper, we have presented a digital restaurants and inter-restaurant navigation using smart phones to customers. Instead of using PDAs to interface with customers, we are using smart phones or tablet to provide necessary interfaces for customer to view and order menu. With private login system, customers can view and make order and receive updates in real-time and collect receipts right from the smart phone itself. It allows customers to navigate the places or directions in restaurant and also it allows restaurant owners to manage orders from customers immediately whenever he or she logged in into the system. Our experience in developing digital restaurants and inter-restaurant navigation using smart phones shows the capabilities of wireless communication and smart phone technology in fulfilling and improving business management and service delivery. This system is convenient, effective and easy so that it improves the performance of restaurant's staff.

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