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E-Restaurant: Online Restaurant Management System for Android

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Abstract:

At today's advanced technologies the mobile phone is brilliant smarter usage product one. With the help of this smart gadget we can make our usages as smart as possible. Some products are commercially available in market which allows restaurant food ordering through internet, android applications, GSM, Bluetooth, RFID, and Wi-Fi wireless technologies. Food ordering is a process of ordering food from a local restaurant or food cooperative through a web page or app. Much like ordering consumer goods online, many of these allow customers to keep accounts with them in order to make frequent ordering convenient. The main purpose of this paper is to design an advanced e-restaurant online management system using android smart mobile with Bluetooth wireless technology. The menu will be displayed automatically using android application on the table and we can directly order the food items with the help of Android Phone. The controller also takes the responsibility to display the menu items selected on the LCD display unit. At the Kitchen section using wireless RF communication the selected items will be displayed on LCD along with user table number.

Key words:

Android application, Bluetooth module, LCD, RF transceiver, PIC microcontroller.

I. INTRODUCTION:

The simplicity and ease of access of a menu are the main things that facilitate ordering food in a restaurant. A Tablet menu completely revolutionizes the patron's dining experience. Existing programs provide an app that restaurants can use to feed their menus into iOS & Android based tablets and make it easier for the diners to flip, swipe & tap through the menu. We aim in providing and advanced menu display using android mobile phones at restaurants with a tablet menu that would recommend dishes based on a recommendation algorithm. In addition to this we run the app on an Android based tablet and not on an iOS based tablet which is more expensive alternative. We use a cloud-based server for storing the database which makes it inexpensive and also secured.Developers of similar applications maintain that customers who seat at tables outfitted with tablets spend about 10% more than those at other tables ("people buy more when they can do so instantly, without waiting for service").

The service goes quicker. Restaurants can build their e-reputation and customer community in live. The restaurant menu, has evolved from its humble beginnings on carte chalkboards and imageless print to today's detailed, colorful displays. With the emergence of digital tablets and user-friendly touch screen technology menus can move to a whole new surface. With this electronic menu, orders can be taken correctly the first time. There is no need to run back and forth to a distant terminal, because the terminal is always with the server.

Every order is associated with an individual seat at the table, and orders are built one customer at a time, just like on paper, but with greater accuracy. Items can also easily be shared by the whole table, moved or modified, and noted and the cost can be calculated in real time. The Recommendation algorithm suggests dishes to the patrons based on previous orders. It makes it easier for the customer to build his/her order and also view the most popular dishes. Moreover, various dimension filters can be used according to individual preferences e.g. Price, taste, quantity, etc.

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In a study earlier, a preliminary experiment was conducted in a restaurant, and a questionnaire.

Figure- 1.Image of Menu displays in restaurants

II. RELATED WORK:

To fulfill the objectives of the proposed idea, we need to understand the basic elements of digital electronics. Several standard books were referred. The PIC Microcontrollers and Embedded Systems Using Assembly and C by mazidi by using this we can learn basic knowledge of Embedded C, PIC survey was administered to fifteen waiters and forty-five customers. The survey result was encouraging. In addition, extensive interviews with restaurant owners were conducted and the results indicated that the proposed system is useful in reducing running cost, enhancing service quality as well as customer relationship. A customer will search for a favorite restaurant, usually filtered via type of cuisine and choose from available items, and choose delivery or pick-up.Payment can be amongst others either by credit card or cash, with the restaurant returning a percentage to the online food company. Rapid growth of various high-tech tools and equipments makes our jobs done comfortable and sophisticated. And the mobile phone is the inseparable part of human lives today. With the help of mobile phones human can do many works related to their civil life.microcontroller embedded systems by Muhammad Ali Mazidi. The idea mainly aims in designing a completely automated menu in restaurants with the help of Android Phone and a LCD to provide a user-friendly environment for feed back display. There is no need of a person to take the order from the table. The menu will be displayed automatically on the table and we can directly order the menu with the help of Android Phone.

Over the years, technology has tremendously revolutionized the restaurant industry. But much of the innovation has been with point-of-sale (POS) operations. Yet other areas of a restaurant are ripe for innovation, such as the menu. Traditional restaurant service requires waiters to interact with customers directly before processing their orders. However, a high-quality recommendation service system would actively identify customers and their favorite meals and expenditure records. There is a famous saying that "People eat with their eyes".

The e-Menu provides additional information about menu items and drinks than a traditional paper menu. With interactive pictures it gives additional information about the food item. Tablets are said to eliminate order-taking errors from the waiters. In the kitchen, there is less confusion as everything is now written clearly. Due to an environment of the building automation in menu display system every order is associated with an individual seat at the table, and orders are built one customer at a time, just like on paper, but with greater accuracy. Items can also easily be shared by the whole table, moved or modified, and noted and the cost can be calculated in real time. The Recommendation algorithm suggests dishes to the patrons.

Figure- 1.Image of Android application for menu order system.

based on previous orders. It makes it easier for the customer to build his/her order and also view the most popular dishes. Moreover, various dimension filters can be used according to individual preferences e.g. Price, taste, quantity, etc. In addition, this helps us in reducing running cost, enhancing service quality as well as customer relationship.

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III. NEW CHALLENGES AND METHODOLOGY:

Intelligent information for menu ordering system is the main direction of development in the field of communication network through wireless technologies like Bluetooth, Wi-Fi, Zigbee etc. Android Phone provides fast access to any and all types of digital media, with no text-bound interface getting in the way. Faster input can mean better service. Using a Android Phone interface can effectively Increase operator accuracy, reduce training time, and improve overall operational efficiencies, a properly designed touch interface can improve each operator's accuracy. Android Phones are practical in automation, which has become even simpler with Android Phone technology. Owners familiar with the icon system appreciate Android Phones that make automation systems user friendly.

Android is an open source platform. Neither developers nor handset manufacturers pay royalties or license fees to develop for the platform. The underlying operating system of Android is licensed under GNU General Public The Android framework is distributed under the Apache Software License (ASL/Apache2), which allows for the distribution of both open and closed source derivations of the source code. Commercial developers (handset manufacturers especially) can choose to enhance the platform without having to provide their improvements to the open source community.

Instead, developers can profit from enhancements such as handset-specific improvements and redistribute their work under whatever licensing they want. Android application developers have the ability to distribute their applications under whatever licensing scheme they prefer. Developers can write open source freeware or traditional licensed applications for profit and everything in between.

Network Connectivity :

It supports wireless communications using:

» GSM mobile-phone technology
» 3G
» Edge
» 802.11 Wi-Fi networks

We have presented a system that can be interconnected with the LCD display systems and PIC microcontroller using android application based on wireless communicating networks like Bluetooth and RF transceiver. The entire proposed idea is divided into two sections (i) Table section and (ii) kitchen section

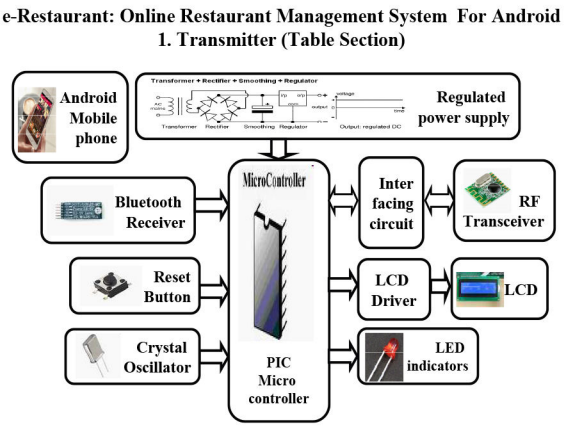

Figure- 2.Block diagram of table (near customer) section

The customer or table section consists of PIC microcontroller interfaced with wireless Bluetooth connectivity, along with LCD display unit, and RF transceiver module. When the customer of the restaurant selects the food items from menu displayed in the android mobile application using Bluetooth wireless technology the data is fed as an input to the PIC microcontroller.

The data which received by the android application is displayed on to the LCD display unit as confirmation of the order and the same data is transmitted over to kitchen section suing RF transceiver wireless communication devices.

The present system uses an onboard mini computer named as PIC microcontroller which consists of number of input and output ports. The input and output port of the micro controller are interfaced with different input and output modules depending on the requirements.

The system provides solution which can be used in other types of application, where the information needed is requested rarely and at irregular period of time (when requested).

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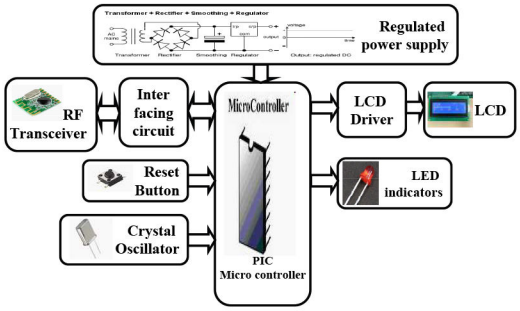

Figure- 2.Block diagram of Kitchen section

The kitchen section consists of RF transceiver module interfaced with PIC microcontroller along with LCD display unit. The controlling device of the whole system is provided using PIC Microcontroller. The data received by the RF transceiver module is fed as input to the controller. The controller acts accordingly like displaying the data transmitted from the table or customer section on to the LCD display unit. In achieving the task the controller is loaded with a program written using Embedded 'C' language. This system can be applicable in industrial environment, home automation and for any other commercial purposes.

IV. HARDWARE IMPLEMENTATION:

The portable System Architecture demonstrates the basic architecture of our system. Understanding the other intricacies and details of the system will become a lot easier both at the backend, and front end i.e., front end which is made up of the android application and the database transmission using RF transceiver, it also includes native mobile application) and the backend architecture supports with the administration or the kitchen section for displaying the selected items.

a. PIC Microcontroller:

In the presented paper Advanced e-Restaurant system we used PIC microcontroller. This project makes use of an onboard computer, which is commonly termed as micro controller. It acts as heart of the project. This onboard computer can efficiently communicate with the output and input modules which are being used. The controller is provided with some internal memory to hold the code.

This memory is used to dump some set of assembly instructions into the controller. And the functioning of the controller is dependent on these assembly instructions. PIC stands for Peripheral Interface Controller given by Microchip Technology to identify its single-chip microcontrollers. These devices have been very successful in 8-bit microcontrollers with Low, mid, high range power crystal oscillators, along with Programmable timers, on-chip ADC, Up to 12 independent interrupt sources, Powerful output pin control 25mA, EPROM/OTP/ROM/Flash memory option, I/O port expansion capability.

Fig.2 PIC Microcontroller

b. Bluetooth module:

Bluetooth is a wireless technology standard for exchanging data over short distances (using short-wavelength UHF radio waves in the ISM band from 2.4 to 2.485 GHz) from fixed and mobile devices, and building personal area networks (PANs). Invented by telecom vendor Ericsson in 1994 it was originally conceived as a wireless alternative to RS-232 data cables. It can connect several devices, overcoming problems of synchronization. The module's host and slave, the host and slave pairing communication from the machine and from the machine or between the host and the host can not communicate, communication function and computers, mobile phones and other Bluetooth pairing purchase default slave , requires that the host needs to be indicated.Bluetooth serial module is used for converting serial port to Bluetooth. These modules have two modes: master and slaver device. The device named after even number is defined to be master or slaver when out of factory and can't be changed to the other mode. But for the device named after odd number, users can set the work mode (master or slaver) of the device by AT commands.

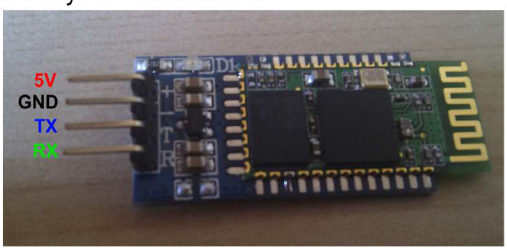

Fig4. Bluetooth Receiver module

c. RF Transceiver Module:

A transceiver is a device that has both a transmitter and a receiver which is combined and share common circuitry or a single housing. If no circuitry is common between transmit and receive functions, the device is a transmitter-receiver. Similar devices include transponders, transverters, and repeaters. The RF Transceiver uses RF modules for high speed data transmission. The micro electronic circuits in the digital-RF architecture work at speeds up to 100 Ghz. The objective in the design was to bring digital domain closer to the antenna, both at the receive and transmit ends using software defined radio (SDR).The software-programmable digital processors used in the circuits permit conversion between digital base band signals and analog and RF.

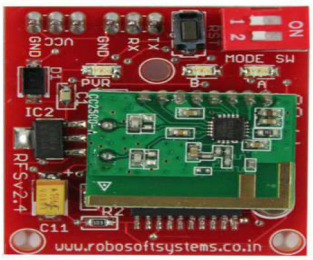

Fig.5. RF Transceiver Module

d. LCD Module:

One of the most common devices attached to a micro controller is an LCD display. A liquid crystal display is special thin flat panels that can let light go through it, or can block the light. Some of the most common LCD's connected to the many microcontrollers are 16x2 and 20x2 LCD displays. It means that 16 characters per line by 2 lines were displayed and 20 characters per line by 2 lines were displayed, respectively. Liquid crystal displays are usually abbreviated as LCD's. These displays are often used in battery-powered devices, such as digital watches, since they require very little amount of electricity consumption.

Fig.5. LCD module

V CONCLUSION:

In the presented paper provides implementation of an advanced e-restaurant menu ordering system using smart android mobile phone. Statistical report for wireless technologies like Bluetooth and RF transceiver along with Android usage its reviews on how the technologies are used for designing a portal device. In Particular it's helpful to identify the aspects of a product that people are happy and makes human work more sophisticated. The paper provides highly advanced IC's like PIC Microcontrollers, Bluetooth module, RF transceivers, module communication technology with the help of growing technology like Android operating systems, the project has been designed and implemented successfully with a unique idea.

The idea of the advanced e-restaurant can also be extended for future using GPRS module. GPRS module can be used to monitor and request of the menu order from table is directly sent to the predefined weblink for process of even billing the items purchased. Usage of Wireless Wi-Fi network, through which the menu order along with feed back replies, can also be monitored in the mobile application of android OS.

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