

# WI-FI Based Restaurant Ordering System

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**Abstract-** Today's era is said to be the world of technology. So many efforts have been taken by restaurants owners also to adopt information and communication technologies such as PDA, wireless LAN, costly multi-touch screens etc. to enhance dining experience. This report highlights some of the limitations of the conventional paper based and PDA-based food ordering system and proposed the low cost touch screen based Restaurant Management System using an android Smartphone or tablet as a solution. The system consists of a Smartphone/tablet at the customer table containing the android application with all the menu details. The customer tablet, kitchen display connects directly with each other through Wi-Fi. Orders made by the customers will be instantly reach the kitchen module. This wireless application issuer friendly, improves efficiency and accuracy for restaurants by saving time, and reduces human errors. This system successfully overcomes the draw- backs in earlier automated food ordering systems and is less expensive as it requires a one-time investment for gadgets.

**Keywords** — *recommendation; tablet; E-menu; android application; intelligent; restaurant.*

## I. INTRODUCTION

Restaurant service such as making reservations, processing orders, and delivering meals generally requires waiters to input customer information and then transmit orders to the kitchen for menu preparation. When the customer pays the bill, the amount due is calculated by the cashier. Although this procedure is simple, it may significantly increase the waiter's workload and

even cause errors in menu ordering or in prioritizing customers, especially when the number of customers suddenly increases during busy hours, which can seriously degrade overall service quality. Therefore, using advanced technologies to improve service quality has attracted much attention in recent years. For instance, the counter system of many fast food restaurants in Taiwan is equipped with a touch screen, In order to overcome these

limitations in manual system, some systems were developed later like PDA based systems and multi-touchable restaurant management systems to automate food ordering process.

PDA's (personal digital assistants) are much in use because of their portability feature and ability to communicate with personal computers but they too have some limitations. A

PDA-based system lacks ubiquitous communication, is exposed to health hazards, requires training of attendants, the need of having attendants to operate, the inefficiency during peak hours and small screen size.

The multi-touchable restaurant management systems also have limitations like: they usually require low resolution output of the monitor; can produce activation without touching the screen and the cost to produce the special Infrared bezel for touch screens is very high. Taking in view these systems, we have proposed our system with more advanced features, which is specially designed for Android Devices.

## II. PREVIOUS SYSTEM

### A. Conventional paper-based systems:

The traditional paper based system is one of the most extensively used systems worldwide. In this system all records are stored on paper. However, this system is plagued with various problems. Some of the problems are highlighted below: -The most common blunder is waiters making mistakes with customer's orders. At times, a waiter can forget to add a specific item, make changes because a customer is allergic to certain substance, or forget to give the order to the kitchen.

-Customers have to wait for a waiter to take their order. They must rely on the waiter to remember their order and specific details. Their food may take longer to be prepared and served if the waiter has multiple tables. They may also get wrong bills since they cannot see their bill amount until their meal is complete.

-Impatient customers also call over the waiter/waitress frequently to find out the status of their order several times during their visit, wasting the waiter's service time.

-Waiters need to constantly check with the chefs to determine when food is ready. Conversely, chef needs to make sure waiters know that food is ready. This can cause the food to get cold over time and lead to potential food-poisoning. It may also lead to wrong orders and an unsatisfied customer.

-Keeping track of empty, clean and reserved tables within a restaurant.

-Busboys must always be alert as to which tables need clearing. This means that they must be always checking for tables. Waiters need to usually alert them. This takes extra time from other staff.

-Managers have to analyze hundreds of paper receipts to determine best-selling items, popular hours and customer satisfaction. They also require re-printing of menus when food is not available or a price needs to be changed. This can be costly and time-consuming to a restaurant

### III. MODERN SYSTEM

To overcome the limitations of existing systems, we propose this integration of touch technology in restaurants based on android technology. It is a wireless food ordering system 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.

Our system aims at providing the following features:

- Combining of Wireless technology and Android OS to automate food ordering process.
- Allow the restaurant to operate faster (faster seating, faster order preparation, faster turnaround on food).
- Reduce employee error, thereby increasing customer happiness. This also reduces waste as when the wrong item is ordered, the food must be discarded.
- To minimize the flaws in conventional system by atomizing the working of a restaurant.
- To provide a mechanism for obtaining feed-back from the customers and provide the restaurant a means of review of their service.

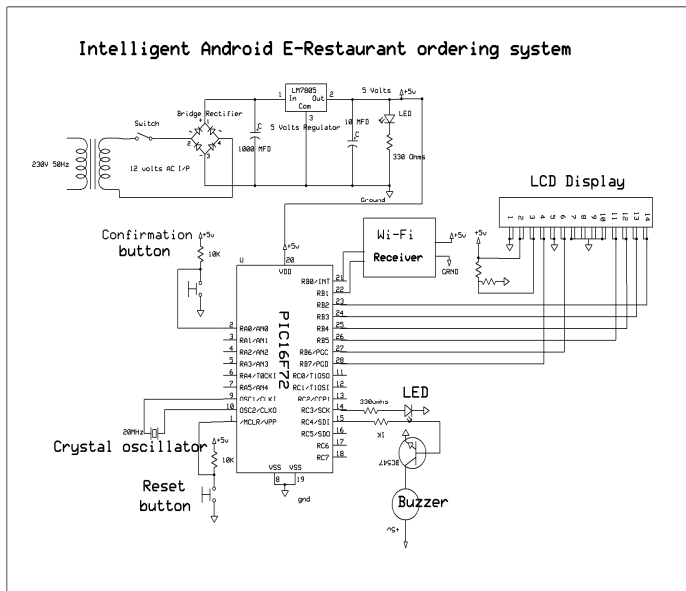


Fig. 1. Intelligent E-restaurant System with Wi-Fi service

The above schematic diagram of **Intelligent E-restaurant System with Wi-Fi service** explains the interfacing section of each component with micro controller, Wi-Fi module and LCD, buzzer. The crystal oscillator connected to 13<sup>th</sup> and 14<sup>th</sup>

pins of micro controller and regulated power supply is also connected to micro controller and LED's also connected to micro controller through resistors and motor driver connected to micro controller The detailed explanation of each module interfacing with microcontroller is as follows:

### IV. IV SOFTWARE DESCRIPTION

This project is implemented using following software's:

- Express PCB – for designing circuit
- PIC C compiler - for compilation part
- Proteus 7 (Embedded C) – for simulation part

#### A. Express PCB

Breadboards are great for prototyping equipment as it allows great flexibility to modify a design when needed; however the final product of a project, ideally should have a neat PCB, few cables, and survive a shake test. Not only is a proper PCB neater but it is also more durable as there are no cables which can yank loose. Express PCB is a software tool to design PCBs specifically for manufacture by the company Express PCB (no other PCB maker accepts Express PCB files). It is very easy to use, but it does have several limitations. It can be likened to more of a toy than a professional CAD program. It has a poor part library (which we can work around) It cannot import or export files in different formats It cannot be used to make prepare boards for DIY production Express PCB has been used to design many PCBs (some layered and with surface-mount parts. Print out PCB patterns and use the toner transfer method with an Etch Resistant Pen to make boards. However, Express PCB does not have a nice print layout. Here is the procedure to design in Express PCB and clean up the patterns so they print nicely.

#### B. PIC Compiler:

PIC compiler is software used where the machine language code is written and compiled. After compilation, the machine source code is converted into hex code which is to be dumped into the microcontroller for further processing. PIC compiler also supports C language code.

It's important that you know C language for microcontroller which is commonly known as Embedded C. As we are going to use PIC Compiler, hence we also call it PIC C. The PCB, PCM, and PCH are separate compilers. PCB is for 12-bit opcodes, PCM is for 14-bit opcodes, and PCH is for 16-bit opcode PIC microcontrollers. Due to many similarities, all three compilers are covered in this reference manual. Features and limitations that apply to only specific microcontrollers are indicated within. These compilers are specifically designed to meet the unique needs of the PIC microcontroller. This allows developers to quickly design applications software in a more readable, high-level language. When compared to a more traditional C compiler, PCB, PCM, and PCH have some limitations. As an example of the limitations, function recursion is not allowed.

This is due to the fact that the PIC has no stack to push variables onto, and also because of the way the compilers optimize the code. The compilers can efficiently implement normal C constructs, input/output operations, and bit twiddling operations. All normal C data types are supported along with pointers to constant arrays, fixed point decimal, and arrays of bits.

PIC C is not much different from a normal C program. If you know assembly, writing a C program is not a crisis. In PIC, we will have a main function, in which all your application specific work will be defined. In case of embedded C, you do not have any operating system running in there. So you have to make sure that your program or main file should never exit. This can be done with the help of simple while (1) or for (;;) loop as tare going to run infinitely We have to add header file for controller you are using, otherwise you will not be able to access registers related to peripherals.

```
#include <16F877A.h> // header file for PIC 16F877A//
```

**C. Proteus:**

Proteus is software which accepts only hex files. Once the machine code is converted into hex code, that hex code has to be dumped into the microcontroller and this is done by the Proteus. Proteus is a programmer which itself contains a microcontroller in it other than the one which is to be programmed. This microcontroller has a program in it written in such a way that it accepts the hex file from the pic compiler and dumps this hex file into the microcontroller which is to be programmed. As the Proteus programmer requires power supply to be operated, this power supply is given from the power supply circuit designed and connected to the microcontroller in proteus. The program which is to be dumped in to the microcontroller is edited in proteus and is compiled and executed to check any errors and hence after the successful compilation of the program the program is dumped in to the microcontroller using a dumper.

**D. Procedural steps for compilation, simulation and dumping:**

*1) Compilation and simulation steps:*

For PIC microcontroller, PIC C compiler is used for compilation. The compilation steps are as follows: Open PIC C compiler. You will be prompted to choose a name for the new project, so create a separate folder where all the files of your project will be stored, choose a name and click save.

**V. RESULTS**

The project “**Intelligent E-restaurant System with Wi-Fi service**” was designed such that the completely automated menu in restaurants with the help of Android mobile phone using Wi-Fi module and a LCD to provide a user-friendly environment. There is no need of a person to take the order from the table. The menu will be displayed automatically on the customer mobile application using wireless Wi-Fi connectivity and we can directly order the menu with the help of press on the men

These are the screen short result of our project



Fig. 2. Status when no input (order) is given

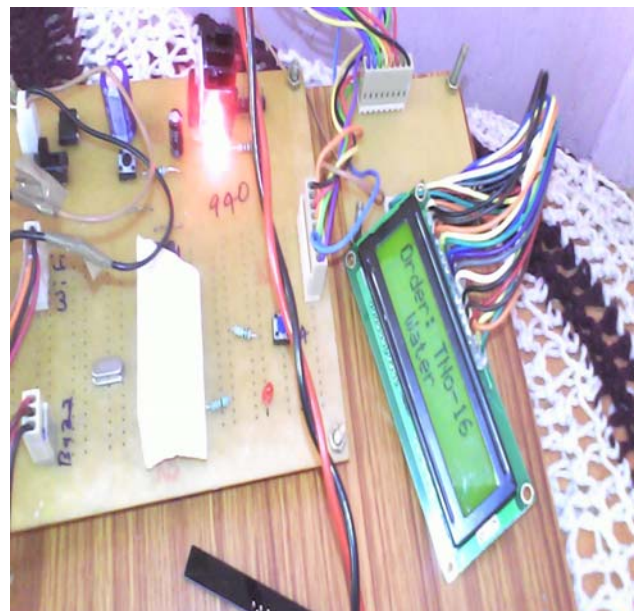


Fig. 3. Order received for Water

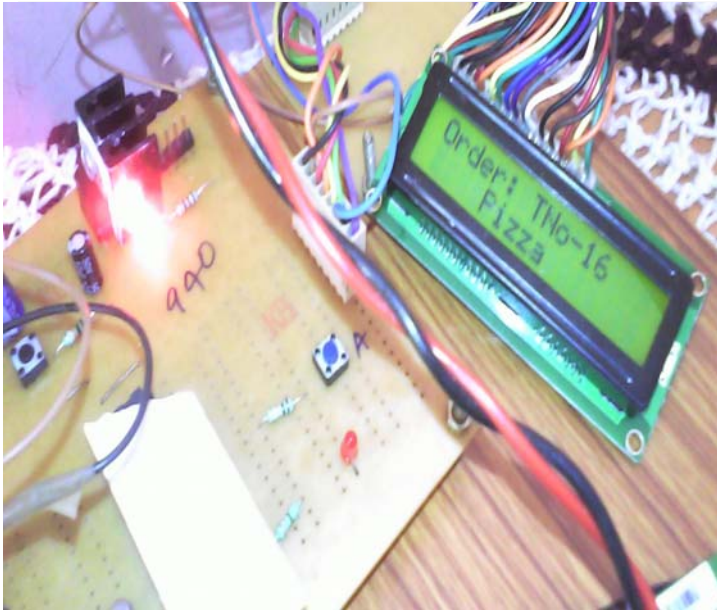


Fig. 4. Order received for Pizza

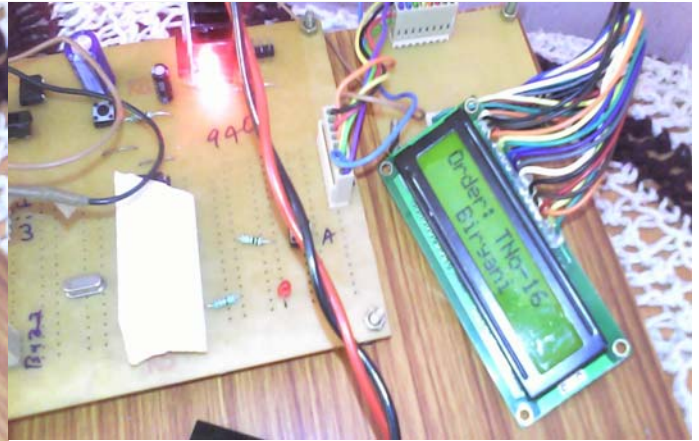


Fig. 6. Order received for Biryani

### VI. CONCLUSION

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

### VII. FUTURE SCOPE:

Our project “**Intelligent E-restaurant System with Wi-Fi service**” was designed such that the completely automated menu in restaurants with the help of Android mobile phone using Wi-Fi module and a LCD to provide a user-friendly environment. There is no need of a person to take the order from the table. The menu will be displayed automatically on the customer mobile application using wireless Wi-Fi connectivity and we can directly order the menu with the help of press on the menu. The controlling device of the whole system is a Microcontroller. Wi-Fi module, LCD, buzzer are interfaced to the Microcontroller. The input module is nothing but a mobile phone with application which takes the input from the user and provides the same to the microcontroller. The output module is Wi-Fi module which makes the communication between system at table and system at ordering department. The controller also takes the responsibility to display the menu items on the LCD. At the receiving end the selected items will be displayed on LCD with user table number. In achieving the task the controller is loaded with a program written using Embedded ‘C’ language

The project can be extended by using touch screen sensor and GLCD for images of food items at restaurants This can eliminate by having a GSM module, which gives the status of order detection working directly through SMS messages along with billing to the predefined numbers. We can also add temperature sensor, module, which is used for fire, temperature detection with GSM module which gives respective information. By connecting temperature sensor to the system we can get the temperature of dangerous zones in

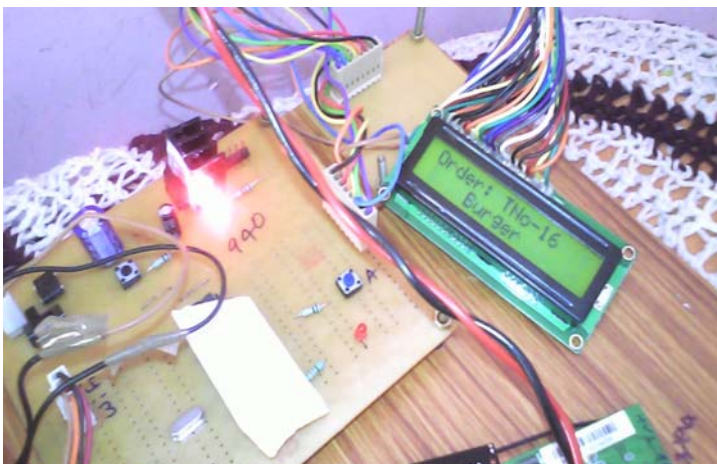


Fig. 5. Order received for Burger

personal computer itself instead of sending human to there and facing problems at field we can send robot to there and sensor will detect the temperature and it gives information to the micro controller and micro controller gives the information to the transceiver from that we can get the data at pc side. By connecting smoke sensor to the robot we can get the information related concentration of smoke or gases in respective field's i.e. (coal mines, dangerous zones, etc). sensor sense the information and it give to the micro controller and it gives to the transceiver and from that we get the information in personal computer.

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