# Design And Implementation Of Ordering System For Restaurants

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*ABSTRACT-* **Generally, in restaurants menu order system will be available in paper format from that the customer has to select the menu items and then the waiter has to come and take the corresponding order, which is a long processing method. So we design a self-service ordering node including its software and hardware. The touch screen displays food items for customers to input their orders directly by touching. The user can also request the order even through speech commands using speech recognition module. The system automatically completes data receiving, storage, display, and analysis. It's provided with many advantages as great flexibility, portability and etc, and has a widely spread of application prospects.**

**Keywords - ordering; Intelligent; ZigBee; Information Management system.**

## I. INTRODUCTION

In recent years, with the rapid economic development people's living standards improve rapidly. India's catering industry developed so rapidly, that competition in the catering industry is becoming increasingly intense. Only improve the service standards can the restaurant obtain the victory of the competition. Traditional restaurant management process is not good enough to adapt to the fast - paced modern life. Therefore, the wireless self - service order management for intelligent information system comes into being.

ZigBee is a kind of wireless sensor network technology, which has many advantages such as data transmission security, high reliability, flexible networking, low cost, long battery life and etc. Restaurant self-service ordering system based on ZigBee technology also has those advantages. It is one of the ideal solutions for informatization transformation of traditional hotels, which can save labor costs, improve efficiency and service quality. According to traditional restaurants operating characteristic, we designed the restaurant self-service ordering system. Ordering device via the GLCD displays the name of the restaurant food items, and by touching the LCD customers can known the price, taste and sample pictures of the food. Customers can order their food by it immediately.



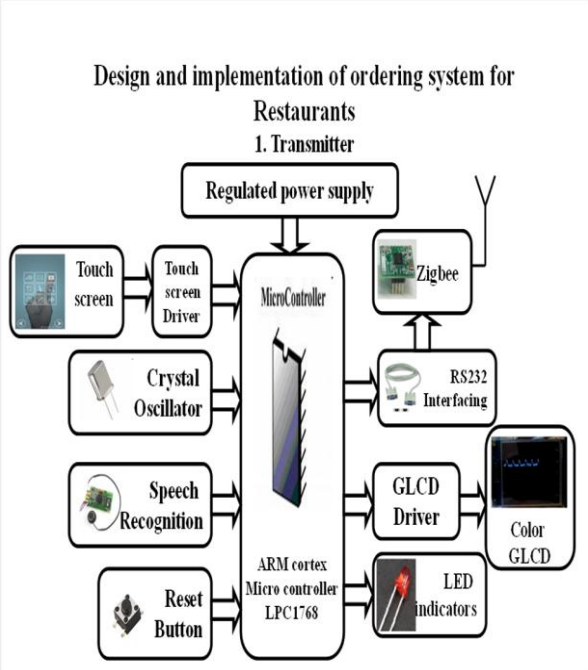
## WORKING MECHANISM

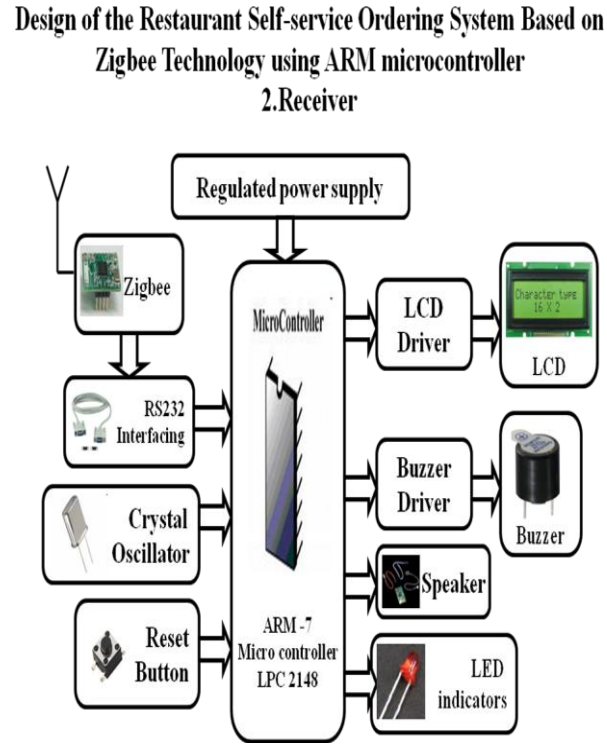
The proposed method mainly aims in designing and implementing completely automated menu system in restaurants to provide a user-friendly ordering environment. There is no need of a waiter to take the order from the table. The menu will be displayed automatically on the ordering system attached to the table, where customer can directly order the menu.

The transmitter section of the system consists of an ARM cortex LPC1768 microcontroller. The input module is a touch screen sensor with GLCD, and speech Recognition, which takes the input from the user and provides the same to the microcontroller. The output module is Zigbee module which makes the communication between system at table and system at cooking

department. The ARM LPC2148 micro controller which is at the receiver section takes the order which is displayed on GLCD along with user table number.

BLOCK DIAGRAM




EXPLANATION OF EACH BLOCK:

**Touch screens** provide 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 the touch-sensor technology is about using our fingers or some other pointer, to view and manipulate information on a screen. On a conventional system, with every mouse click, the operating system registers a mouse event. With a touch-screen system, every time your finger touches the screen, a touch event is registered.

The **speech recognition system** is a completely assembled and easy to use programmable speech recognition circuit. Speech recognition will become the method of choice for controlling appliances, toys, tools and computers. At its most basic level, speech controlled appliances and tools allow the user to perform parallel tasks (i.e. hands and eyes are busy elsewhere) while working with the tool or appliance. The heart of the circuit is the HM2007 speech recognition IC. The IC can recognize 20 words, each word a length of 1.92 seconds.

The Serial Graphic LCD backpack is soldered to the 128x64 pixel graphic LCD and provides the user a simple serial interface to a full range of controls.

Crystal oscillator is used to maintain speed and synchronization of execution of instructions.

The reset button is a button that when clicked, will clear all of the fields in the micro controller, and executes the instructions from the starting address. A switch placed between the digital input and ground will short the digital input to ground when it is pressed. This means the voltage seen at the input will be high when

the switch is open and low when the switch is closed.

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical or piezoelectric.

Led indicators have a life of at least ten years and consume 90 per cent less power than conventional indicators. Depending on the type of the materials (GaAs,) led will gives the output in different colors (red, Yellow, green etc..) LED's are used as indicator lamps in many devices, and are increasingly used for lighting. Introduced as a practical electronic component

## II. SYSTEM HARDWARE DESIGN

The hardware design and implementation of ZigBee based transmission device. Fig. 2 is a block diagram of the ZigBee based transmission device. A. ZigBee RF chip- CC2430 is the core of the transmission device. This device can be powered by battery or USB, and it uses the GPIO or UART to communicate with other parts.

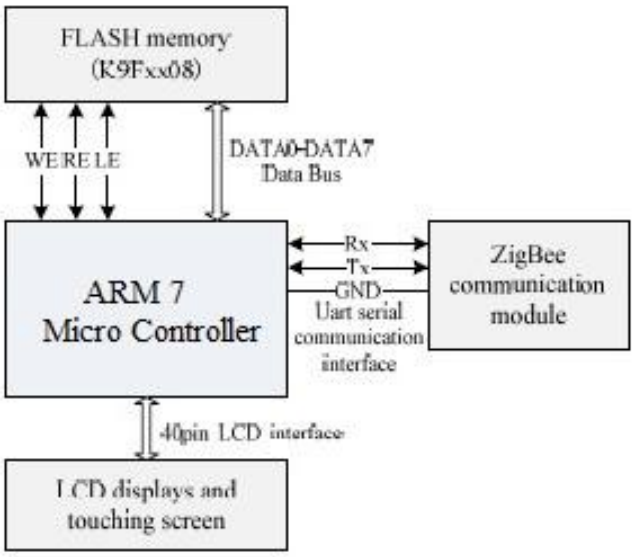



Fig1. LCD display and Touch Screen module

General design of Touch Screen order device:

The order device is an embedded system using ARM cortex LPC1768 embedded microcontroller and speech recognition. ZigBee wireless communication module via serial bus to connect to the embedded system. An optimized embedded C operating system is running in it. A procedure is in charge of user interface, it display and process user actions. Finally, the data is transmitted to the ZigBee communication module. As shown in Fig.2, ZigBee module and the embedded system through the three UART data lines to communicate. Ordering information is transmitted to the ZigBee module via UART. After ZigBee module complete the verification of data frame, data was sent to center server by established network of ZigBee.

## III. SYSTEM SOFTWARE DESIGN

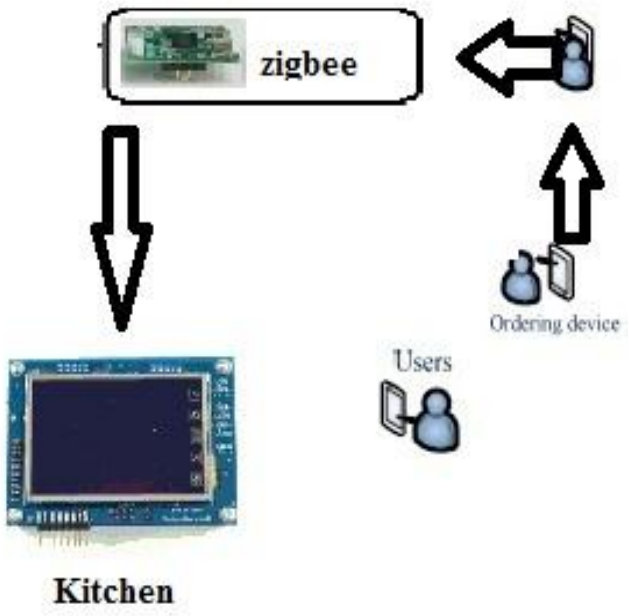



Fig2.The architecture of ordering system

The network structure of restaurant self-service ordering system is shown in Fig. 1.The nodes according to network functionality are divided into two categories - FFD (Full Function Device) and RFD (Reduced Function Device) FFD is a network coordinator which can communicate with any other device; RFD usually only used in star topology network, which can only communicate with the FFD. There is only one FFD a single network, as the center of the entire network, it has all the control strategy, it receives the data from the RFD, through the intelligent post-judgment, then data is stored into the database. At the end, the system server will send data's to the kitchen.

FLOW CHART

A. Procedure for ZigBee Node:

The software design is based on a condensed version of the open source ZigBee protocol stack. This protocol stack is a subset of the standard ZigBee protocol 1.0. It implements IEEE802.15.4 and some ZigBee application layer and security layer features. We designed the communication protocol of this System on the basis of this protocol stack. The ZigBee device's program flow is shown in FiG 2. For the FFD, the main work is to establish a wireless network and distribution network address to the newly added node; For the RFD the main work is joining the network, ensuring data transmitted to the FFD accurately.

B. Procedure for ordering software:

The ordering program is a visual program running on Embedded C. It implements a graphical and touching user interface. We use the QT framework to develop the program, which is a cross-platform GUI application development framework widely using in Embedded C. This program uses the embedded system's UART to communicate with ZigBee module, the final information was transmitted to the central ZigBee node who connect to server. All of above realized real - time information transmission and management.

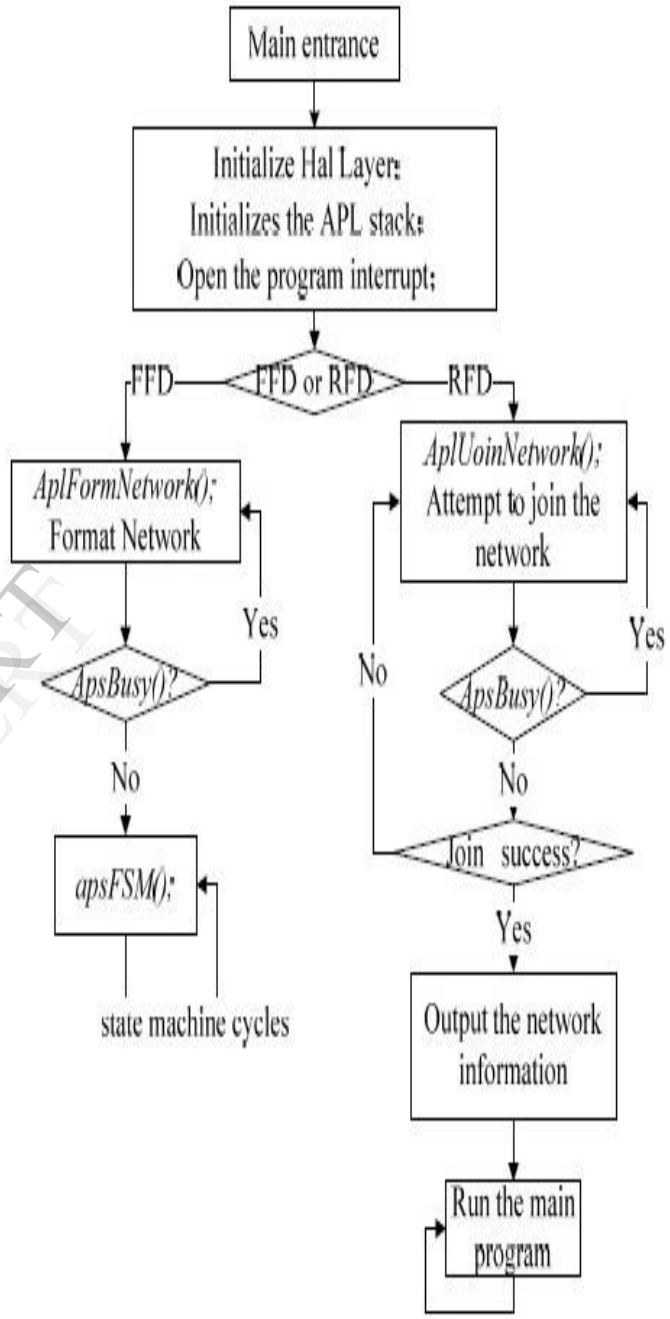



Fig3.Program schematic of the device

## 1V. APPLICATION EXPERIMENTS

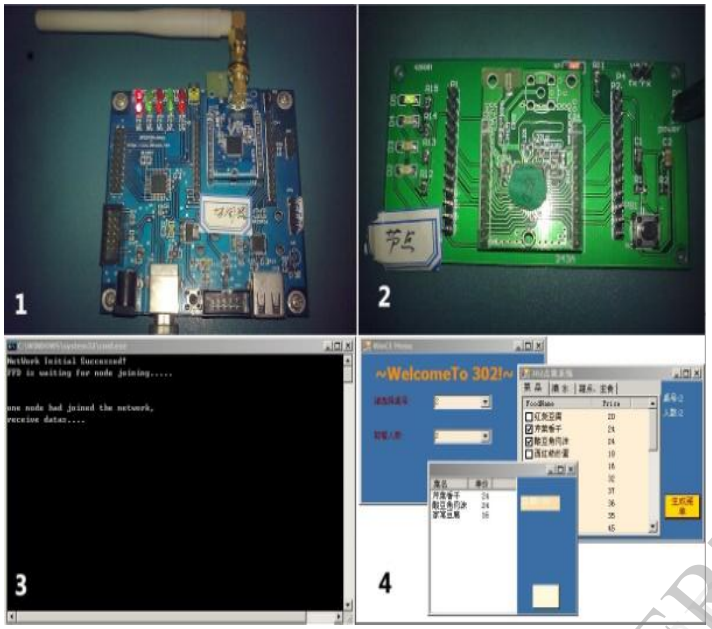



Fig 4. The picture of application experiments

**A**. ZigBee network communication experiment:

In accordance with the procedure displaying in Fig.3 we write the code of the program implement. To verify the ZigBee network communication capabilities, we do the following experiments.

At the first, download the program to RFD and the FFD, turn on the FFD, as shown in Fig.4-1, The light left-most two red LED indicate that power on and network formation of success. Secondly, power on the RFD, Press the reset button, RFD will try joining the network many times. As shown in Fig.4-2, it joins success, if the green LED light Up. Fig. 4-3 shows the information received form the FFD by serial bus after the RFD successfully joined the network and the system began to work. The Fig. 4-4 show the Ordering program UI.

## V. CONCLUSION

In this paper, we designed an intelligent restaurant self-service ordering information system based on ZigBee wireless technology, this system can improve the management level of traditional catering enterprises, can reduce the cost of catering enterprises in financial accounting. It also can improve human resource utilization, and dramatically speed up the serving speed, speed up the checkout speed. This system can real-time receive, store, analyze, display and analysis data for each user. It's flexibility and portability which have very broad application prospects.



## VI. REFERENCES

Karlof, C., Wagner, D.: Secure Routing in Wireless Sensor Networks: Attacks and Countermeasures, First IEEE International Workshop on Sensor Network Protocols and Applications, May 2003. Page 16.

Circuits and Systems, 2003. ISCAS '03. Proceedings of the 2003 International Symposium on Volume 5, 25-28 May 2003 Page(s):V-105 - V-108 vol.5

Dr. Robert B. Reese, A ZigBee-subset/IEEE 802.15.4 Multi-platform Protocol Stack website http://www. ece.msstate.edu/reese Neil Matthew, Richard Stones. Beginning Linux Programming. Third Edition. USA: Wrox Press, 2003. pp. 580-618.