

Automatic Menu Ordering System Using Zigbee and Arm Processor

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Abstract

The main aim in the present field is Automation, reduce Power consumption and also reduce the cost. Automation is necessary to reduce man power. Wireless communication has become an important role in the field of automation. Combination of an embedded system and wireless communication used in designing of various applications ranging from home automation to industrial automation. The aim to substitute the traditional pen and paper method by the automating menu ordering system to save the time consume by traditional menu ordering system. We use ZigBee pro and SQL Server database to develop the automatic ordering system. Due to this system customer can easily order the food from table. Also the serving of food is easier and serves on first come first serve basis. Also manager get all the information of food material available after every order in the kitchen.

Keywords: Zigbee; ARM; Restaurant management

Introduction

In almost every area, technology has changed traditional ways. At present, all most all the restaurant use pen and paper to take order from customer. This waste lot of time and also time requires sending that order to the kitchen is also more. To solve these problems, we designed an automatic menu ordering system. It will improve the quality of services.

In this project, we use ZigBee pro with My SQL Server database to develop the automatic menu ordering system. This system will fatly send food order to the kitchen and serve the food according to the order. It will give total information of order given by customer & information of food material to the manager. It will also give the total information of raw material available in the kitchen and also update that information after every order. This will reduce the task of manager to go into the kitchen every time and avoid in sufficiency.

Literature Review

In this system they used Zigbee CC2530 with My SQL server database and Visual Studio C#. All the information of meals and account firstly recorded in this system and manager can get all the information from this system. The customer is track by 15693 RFID TAG as ID card. They get table number and meals information from this tag. The counter uses this system to take orders of customer, and then at kitchen side all this meal information is received.

When the customers enter into the restaurant they get E-tag from the counter. They can choose any seat from this E-tag and then put that E-tag on sensing module on the table. This module will give all the information to system by Zigbee. From this tag system identify the position of the Customer. Then waiter will serve the food according to the priorities [1].

The proposed system is a basically a combination of wireless communication system, a database, and an android application to place the order [2]. The android application is used by the touch screen device which fitted at the table. This android application contains all the information related to menu like picture of food item. The ordered details are sent to the kitchen and the cashier by wireless system. Android application at the manager side is used to update the menu a central Database, view and manage table wise customer's orders, and receive feedbacks from the customer [3].

The proposed paper highlights some of the limitations of PDA-based food ordering system and given the solution by multi-touchable E-restaurant system. Customer has to give the order using multi-touchable dining table. This order is send to all parts of the restaurant. In kitchen chefs can make food according to order. Cashier can make a bill. Manager also used this to evaluate business status like making changes to the food item. Adobe Flash Action Script 3, PHP scripting and My SQL database was used to build this system [2].

Problem Evolution

Now a day everybody goes to the hotel or restaurant. At that time they have to spend too much time to give the order with pen and paper system. For that purpose they also have to wait for the waiter. To overcome this problem we had designed the system named as automatic menu ordering system. With the help of our system we had tried to reduce the task of manager by inventory management system [4,5].

System architecture

System architecture is basically divided into two parts first one is user side and second is kitchen side. User side is a transmitter which includes touchpad, LCD, Zigbee, ARM processor to give the order. At kitchen side LCD, keys, Zigbee is used to receive order and give the reply to user (Figures 1 and 2).

Ordering table/user area

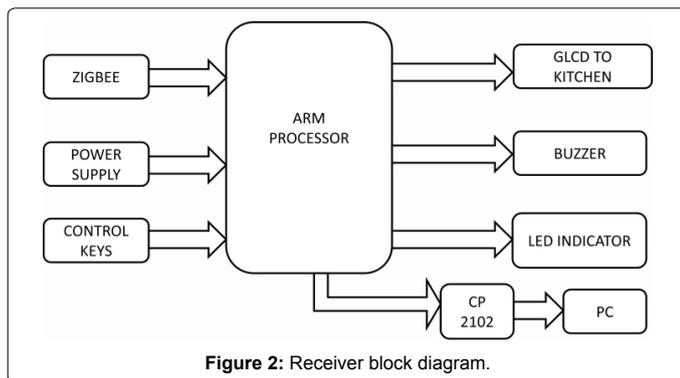
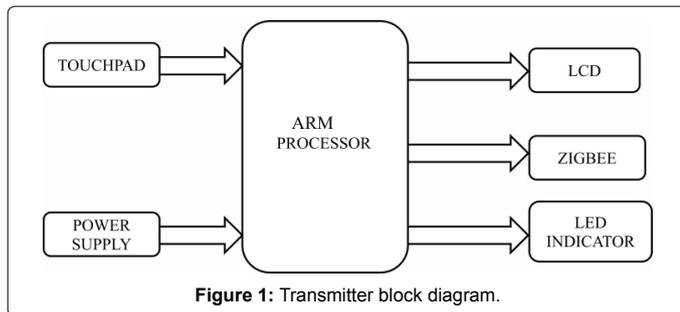
Ordering table is the transmitter in our system from which customer can give their order. List of menu is shown to the customer on the table. From that menu customer have to select their order using touchpad. After giving all the order customer have to confirm their order, after confirmation that order is send to the kitchen and at the manager's place. This all transmission is done by using Zigbee Module.

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Kitchen area

Kitchen area is the receiver side of the system. In kitchen buzzer gives information about the new order placed by the customer also order is display on the LCD in the kitchen. Whenever order is received at the kitchen reply is given to the customer immediately and food serve according to the first come first serve basis.

Manager area

On manager computer all the information of orders given by customer is received. It also includes the information of food material available after every order in the kitchen. For security purpose login ID and Password is needed. Manager can change its Password. Manager can manage all the activity in the restaurant using this system. Manger can add any new food item. Bill is also display at manager side.

System Design

The components used to make this system are:

- **LPC 2138:** This is ARM Microcontroller used for controlling the various operation. This is the main part of this project. The other component is interface with the microcontroller. It provides the various features useful for project.
- **Zigbee:** Zigbee is used as transceiver. It is used at transmitter for sending the order and receives the reply from the kitchen. At receiver it is used for receiving order from user and sends the reply. All this is wireless communication.
- **Touchpad:** Touchpad is clear sheet of plastic with tiny sensors that detect the pressure from either fingertip or a pointing device. Here it is used for give an order. By touching at noted point customer can select quantity of that order, confirm the order and send the order to kitchen side.
- **LCD:** LCD is Liquid Crystal Display. There are different types of LCD available in the market. Here 16x2 LCD is used.

At transmitter LCD is used for display the menu and other information like bill etc. At receiver it is used for display the menu send by customer.

Flow of System

The system is start from the customer’s table. When the customer is sit on the table system is initialize and display the name of system. The various menus are display on LCD display; customer has to select the quantity of particular food item by pressing noted point on touchpad. If customer wants to increase the quantity then again press the touchpad. After selecting quantities of the entire food items bill is display on the screen. This order is now send to the kitchen side using zigbee. At kitchen after receiving order reply is given to the customer using keypad. Customer is received reply of unavailable food item. Then customer again have to reply back to confirm the order. Then food is served according to the order.

The order is also send to the manger also. At manager side after login web page is open which include all the information related to restaurant. Manager can add the food item, check the bill, change username password, and see the remaining food material in the kitchen in short manage all the activity.

Result

This is the result of hardware of this project, which include order display at customer side (Figure 3) and order display at receiver side (Figure 4).

Below two figures shows the result of software or GUL of project which home page before login (Figure 5), Home page after login (Figure 6). Figure 6 shows some tag at left side this is the page which manger can access after login which include add food item, change password page.

Conclusion

This menu ordering system provides an automatic ordering using touchpad; also provide the bill at table after putting an order on display. This Systematic process of ordering food avoids human error that caused due to traditional pen and paper method. This system reduces time taken for order the food. It also avoid the food material availability problem by providing all the information of orders and remaining food material after every order to the manager. In the future, the ordering system will be implemented on hotels and restaurant.

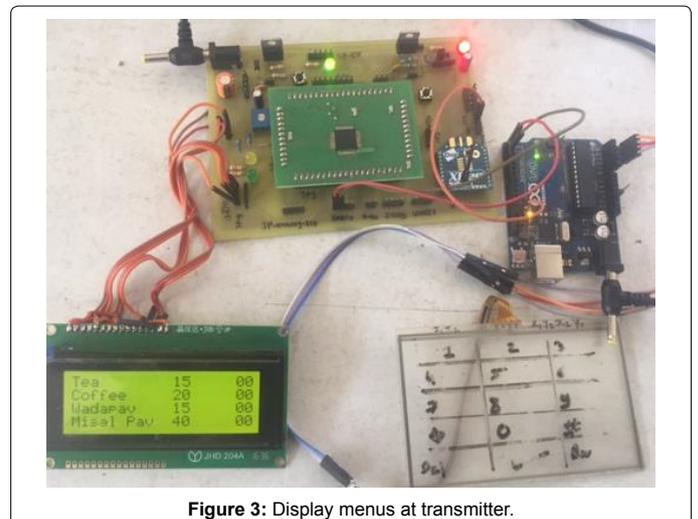




Figure 4: Display menus at receiver.

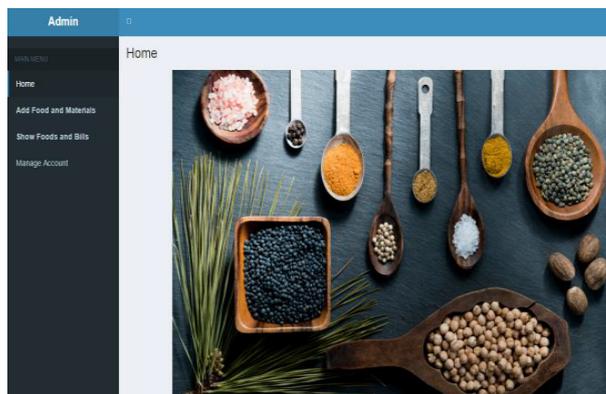


Figure 6: Home page after login.



Figure 5: Home page before login.

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