



International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Website: www.ijirccce.com

Vol. 5, Issue 7, July 2017

Digital Menu Card for Restaurant Using Microcontroller 8051 and CAN Controller

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ABSTRACT: Waiter less restaurant provides a system which has a microcontroller, Liquid Crystal Display and some pushbutton switches using which a customer sitting on the table, can place his order. The order is received by the kitchen section and it again notifies the customer when the food is ready. This project aims at reducing the number of waiters in a restaurant, thereby reducing the cost paid by the customers. By using the above said system, the customer would be able to place their orders directly to the kitchen. After the process, final amount is calculated and displayed on the counter section where final payment is to be done.

KEYWORDS: Reducing overheads, LCD, microcontroller, CAN controller, Keil.

I. INTRODUCTION

Restaurants are one of the favourite places where people usually like to visit and spend their time with their family. Service and Hospitality plays a very important role, as they have a very great impact on the business of a restaurant. There are many reasons why a customer could get dissatisfied and one of the reasons are long time by the waiter to take the orders of the customer as number of waiters in the restaurant are less i.e. for four –five tables there would be one waiter only. In addition, the cost that we see on the menu card for the food items also includes wages of waiter in form of service taxes. There are chances of human error, like a waiter taking a wrong order and serving it to the customer.

Our project mainly aims at reducing the waiters by providing a microcontroller based application, which performs tasks such as taking the order on the table via pushbutton switches, providing acknowledgment from the kitchen to the customer sitting on the table, displaying the final amount to the customer as well as to the manager on the counter.

This system has the ability to overcome the time delays in traditional ordering system. This system can also reduce the excess of labor required in relatively less unskilled occupation. This system is somewhat similar to an automation project. Automation is certainly the next step towards creating a suitable environment wherein humans and machines can easily communicate with each other because of which machines could help human intervention reduce tremendously.

II. LITERATURE REVIEW

Sushmita Sarkar, Resham Shinde, Priyanka Thakare, Neha Dhomne, Ketki Bhakare working at Department of CSE, Dr. Babasaheb Ambedkar College of Engineering and Research, Nagpur, India Lecturer, Department of CSE, Dr. Babasaheb Ambedkar College of Engineering and Research, Nagpur, India respectively have presented an idea for Integration of Touch Technology in Restaurants using Android in "International Journal of Computer Science and Mobile Computing." (IJCSMC)

Nowadays number of restaurant and population of restaurant-goers have emphasized the need to enhance the working of hospitality industry. This research improves the quality of services and business of the hospitality industry by

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incorporating technology. There are already many applications based on wireless technology for enabling partial automation of the food ordering process.

This paper includes the integration of touch technology in restaurants using android. This system is a basic dynamic database utility system which fetches all information from a centralized database. The tablet at the customer table contains the android application with all the restaurant and menu details. The customer tablet, kitchen display and the cashier counter connects directly with each other through Wi-Fi. This wireless application is user-friendly, improves efficiency and accuracy for restaurants by saving time, and reduces human errors.

It is also a one- time investment for restaurant owners and this system is quite less expensive making it affordable for small restaurants. [4]

VikasMullewar, VaibhavVirdande, MadhuraBannore, AshwiniAwari, RaviprakashShriwas pursuing M.Tech at J.D.I.E.T Amravati University , Yavatmal ,India have presented an idea for Electronic Menu Card For Restaurants in “International Journal of Research in Engineering and Technology.” (IJRET).

In restaurants traditional menu cards are over all expensive, monotonous, difficult to maintain and over a period of time it loses its ‘worthy appearance’. It is tedious to update paper menus with new prices, dishes and ingredients therefore to challenge all such obstacle and to enhance restaurant’s guest experience and exquisiteness of the establishment, Touch screen Based electronic menu card is proposed. Also the new system is to reduce need of excess manpower and to eliminate excess time spend on giving manual order through waiter. The main focus of the implemented system is to increasing the usability and user friendliness of menu card with its simple navigation using GLCD and touch screen.

The system uses KIOSK technology for ordering in the restaurant. For order customer simply have to touch on available food menus. This automated menu card system is more effective than traditional menu system.[2]

III. METHODOLOGY

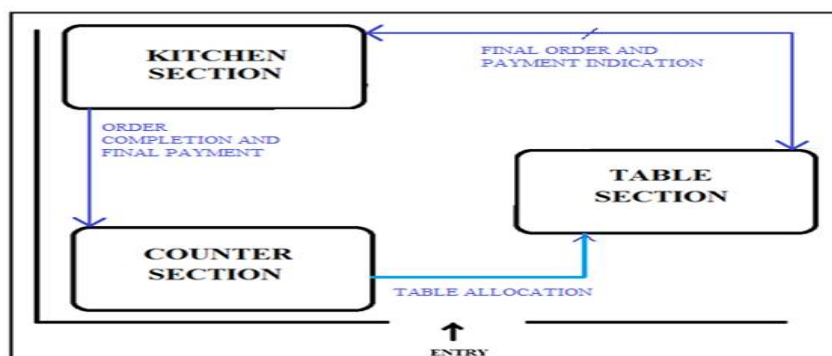


Fig.1: Scheme of project.

The overall flowchart of Waiter less Restaurant is shown above. The model is divided into 3 sections – kitchen, table, and counter. As we can see, exchange of signals mainly takes place between kitchen and table. There is only one signal that is being sent to counter section from kitchen and one signal from counter to table. The following project exhibits a master/slave setup. Master/slave is a model of communication where one device or process has unidirectional control over one or more other devices. In some systems, a master is selected from a group of eligible devices, with the other devices playing the role of slaves. In this restaurant, the table is being assigned the role of a master and therefore the kitchen and counter act as slaves.

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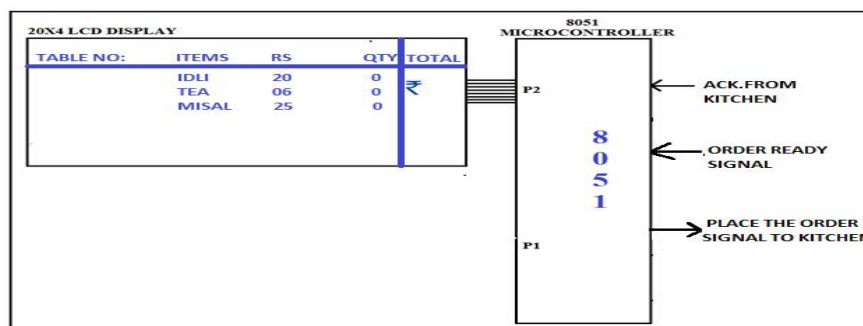


Fig.2: Kitchen layout.

Mode of communication is achieved using a CAN Bus Controller. The CAN controller has a BIU (bus interface unit consisting of buffer and driver), protocol controller, status-control registers, receiver-buffer and message objects. These units connect the host node through the host interface circuit. CAN-bus line usually interconnects to a CAN controller between line and host at the node. It gives the input and gets output between the physical and data link layers at the host node.

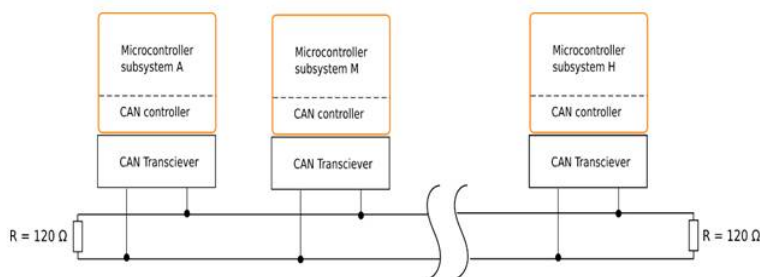


Fig.3: CAN controller.

There are three push buttons assigned to the counter. Following are the functionalities of each push button-

1. For selecting the cursor, so that every item on the menu can be individually highlighted.
2. Incrementation of quantity for each item.
3. Confirming the order, so that the final amount can be processed and sent to the kitchen.

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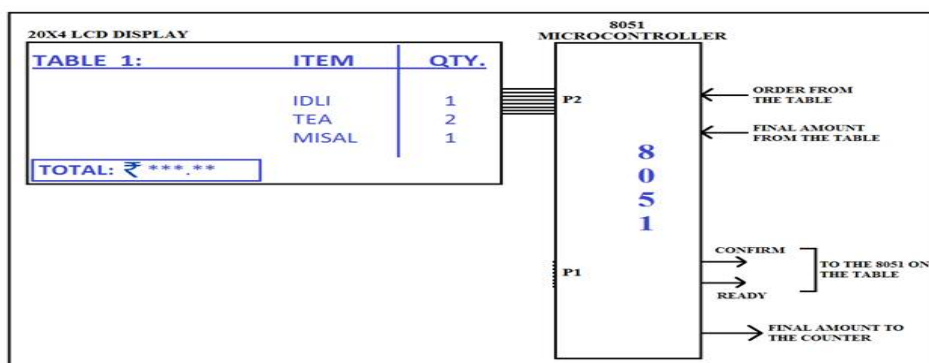


Fig.4: Table layout.

The Rxd pin of the CAN Controller is connected to the Trans receiver(CAN Bus). Depending upon the Txd input, the CAN Bus operates in the following two modes: DOMINANT and RECESSIVE.

If the Txd pin of the CAN Bus is zero; then will operate in DOMINANT mode. Upon being set to 1; it acts in RECESSIVE mode. The output across the Rxd pin in Dominant and Recessive mode is 0 and 1 respectively. Communication between micro-controllers is achieved via CAN Bus through frames. CAN have four frame types:

1. Data frame: a frame containing node data for transmission.
2. Remote frame: a frame requesting the transmission of a specific identifier.
3. Error frame: a frame transmitted by any node detecting an error.
4. Overload frame: a frame to inject a delay between data and/or remote frame.

The kitchen has five push buttons: Four for disabling each item, in case the ordered item is not available and one for order conformation. There are a total of two incoming signals and three outgoing signals from the microcontroller. The incoming signals include the order that is placed by the customers and the final amount that is calculated after the customers are done having their food. The three outgoing signals include the CONFIRM, READY signals and the final amount that has to be transmitted to the counter section. The amount is decremented and sent to the counter and the table, if the ordered item is not available.

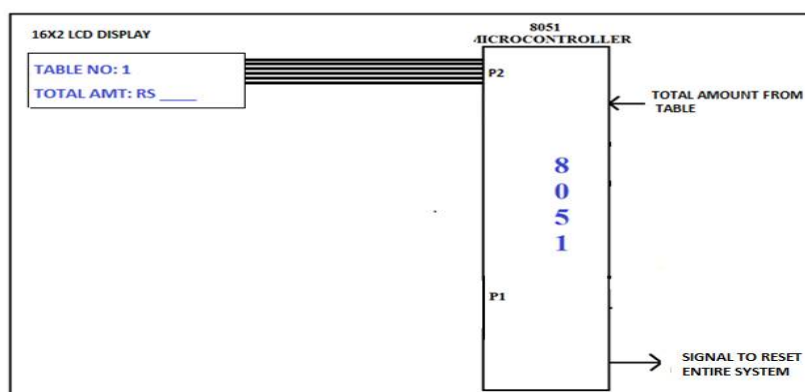


Fig.5: Counter Layout

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As soon as all the process of table and kitchen section is over and customer has finalized his order; Final amount will be displayed on the LCD, so that the person sitting on the counter can take note of the amount to be paid by the customer. Then, the final amount has to be paid by the customer at the counter. After the final bill is paid, the counter resets the table and the entire process can be repeated.

IV. EXPERIMENTAL RESULTS

Figures below show the results of the working demonstrated above.



Fig.6: Menu on a tableFig



Fig.7: Selected Items



Fig.8: Order received in the kitchen



Fig.9: Order completed



Fig.10: Payment at counter



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V. CONCLUSION

Nowadays number of restaurant and population of restaurant-goers have emphasized the need to enhance the working of hospitality industry. This research improves the quality of services and business of the hospitality industry by incorporating technology. There are already many applications based on wireless technology for enabling partial automation of the food ordering process. The concept proposed above illustrates the need of creating a Waiter less restaurant, which not suffices the need of the customers; but also provides an environment where resource and time management can be handled effectively. Economical management of resources is taken into consideration along with in- cooperation of technology. This project not only aims at creating a prototype but also benefit the food industry through communication technology.

Some of the additions that can be integrated in this project are as follows –
Increase the size of the display (tablet or monitor size) for better view. It also allows us to incorporate more number of food items in the menu. Integrate the circuits in a box/support and take out just LCD and push button switches.
Install a small printer, which shall provide a billing receipt. Support net banking so that payment can be done faster.
Try installing a mechanism, which shall eliminate the customer's part of taking their food making the whole process automated.

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