

Shraddha G. Malviya¹, Nikita D. Deshpande², Shivani G. Mahalle³, Prof. Sharvari Tantarpare⁴

Department of Electronics & Telecommunication Engineering, P.R.M.I.T&R, Badnera

¹shraddhamalviya05@gmail.com

²nikitathedeshpande21@gmail.com

³mahalleshiv@gmail.com

⁴tantarparesharvari@gmail.com

Abstract—Nowadays people are looking forward for a system that will satisfy their needs more comprehensibly. Most of the restaurants industries are looking for any application that enhances the dining experience as well as that increase the profit. In traditional ordering system the waiter notes down the order from the customer then places the order to the kitchen and then the billing is done which consumes time and may cause errors. This project aims to automate the food ordering and billing process in restaurant as well as to improve the dining experience of customers.

Keywords- Arduino, TFT display, touch screen, RFID

I. INTRODUCTION

The advancement in technology has greatly influenced the business transactions. The adoption of digital technology has led to automation in the hospitality industry. Business in hospitality industry such as restaurants can be improved with the help of digital systems. The competition in restaurant business have increased with the advancements in food ordering techniques.

This project aims to automate the food ordering and billing process in restaurant as well as to improve the dining experience of customers. Here we discuss about the design & implementation of Smart Restaurant ordering system with real time with customer's feedback for restaurants. The system on user's table will have all the details of his account as well as menu. The order details from the customer's table are updated and subsequently sent to kitchen after swiping the RFID card from which the amount will be deducted. The restaurant owner can manage the menu modifications easily. Touch screen 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. Touch screens are practical in automation which has become even simpler with advancement in technology.

II. PROBLEM STATEMENT

The traditional food ordering system is entirely a manual process which involves waiters, pen and paper. The customer has to wait for waiters to take the order. The waiter notes down the orders from customers, take these orders to kitchen department, update them in records and again make the bill. Though this system is simple; it may involve errors while noting down the orders as well as in making calculations. Even it is sometimes difficult to interpret the handwriting of the waiter. To overcome these limitations in manual system, some systems are being developed to automate food ordering process. By using Smart Restaurant Ordering System, the ordering system is made more efficient and can help the manager to avoid human error and enhance business development. In this system, ordering transaction is a step by step process to make the transaction more systematic and system can guide the staff to avoid any order mistakes. The transaction between waiters and restaurant departments and also between waiters and cashier will be systematic and efficient. Besides the efficiency, this system can give better quality of service to customers and will attract more customer to get this quality services.

III. Technologies Used

A. Arduino Mega 2560

It is an open-source computing platform based on a simple i/o board and a development environment. Arduino can be used to develop stand-alone interactive objects or can be connected to software on your computer. The open-source IDE can be downloaded for free (currently for Mac OS X, Windows, and Linux)

Arduino Mega is composed of Atmega 2560 microcontroller. It has 54 digital input/output pins, sixteen analog inputs, four UARTs (hardware serial ports), a crystal oscillator of 16 Mhz, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything that is needed to support the microcontroller.

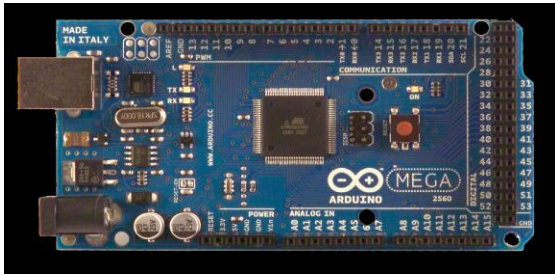


Fig.1 Arduino Mega 2560 Development Board

B. Resistive touch screen

The 4-wire Resistive Touch Screen consists of a conductive bottom layer of either glass or film and a conductive topmost film layer, separated by extremely small, transparent spacer dots. A voltage is applied across the conductive surface. Any type of probe can be used to apply pressure against the top film will activate the screen. When ample touch pressure is applied to the topmost layer, the film will flexes inward and makes contact with the bottom layer resulting in a voltage drop. This change in voltage is detected by the microcontroller. By alternating the voltage signal between the top and bottom layer, the x and y coordinates of the user's touch are computed. In a Film on Glass (FG) construction, the bottom layer is an ITO coated glass. In a Polyester Laminated or film-film-glass construction the bottom conductive layer is polyester. An additional layer of optically clear adhesive bonds the bottom polyester layer to a backer typically made of glass material.



Fig.2 4wire Resistive Touch Screen

C. TFT Display

ILI9327 is a 262,144-color single-chip SoC driver for a-TFT liquid crystal display having resolution of 240RGBx432 dots, comprising a 720-channel source driver, a 432-channel gate driver, 233,280 bytes GRAM for graphic data of 240RGBx432 dots, and power supply circuit. ILI9327 can operate with 1.65V I/O interface voltage, and an incorporated voltage follower circuit to generate voltage

levels for driving an LCD. The ILI9327 supports a function to display in 8 colors and a sleep mode, allowing for precise power control by software and these features make it an ideal LCD driver for medium or small size portable products such as digital cellular phones, smart phone, MP3 and PMP where long battery life is a major concern.



Fig.3 TFT Display

D. RFID

Radio Frequency Identification uses a semiconductor (micro-chip) in a tag or label to transmit stored data when the tag or label is exposed to radio waves of the correct frequency. The acronym refers to small electronic devices that consist of a small chip and an antenna. The chip typically is capable of carrying 2,000 bytes of data or less. The RFID device serves the same purpose as a bar code or a magnetic strip on the back of a credit card or ATM card; it provides a unique identifier for that object. And, just as a bar code or magnetic strip must be scanned to get the information, the RFID device must be scanned to retrieve the identifying information.



Fig. 4 RFID card

IV. Methodology

The system consist of microcontroller, which is interfaced with input and output modules. The controller acts as an intermediate medium between both of them. Hence the controller acts as control unit. The input module is nothing but the touch screen sensor which is placed on TFT display to have graphical image display, which takes the input from

the user and provides same to the microcontroller. The RF module is output module which makes a communication between system at a table and a system at a ordering department. The controller also takes the responsibility to display the menu items on a graphical LCD. The selected items will be displayed on along with table number at the receiving end. These selected items will be confirmed by receiving section where and the costumer will be acknowledged. The costumer will also be updated about the progress in order. Also the customer will pay the bill using his authenticated RFID card.

The order will be placed at kitchen section after the customer pays the bill. The bill will be paid with the help of RFID card. The customer needs to swipe the RFID card at the billing module then the amount or the total cost of the selected items will be deducted from the user account. And only after the deduction of amount the order will be placed in the kitchen section where it will be confirmed and the customer will be acknowledged with the confirmation of order.

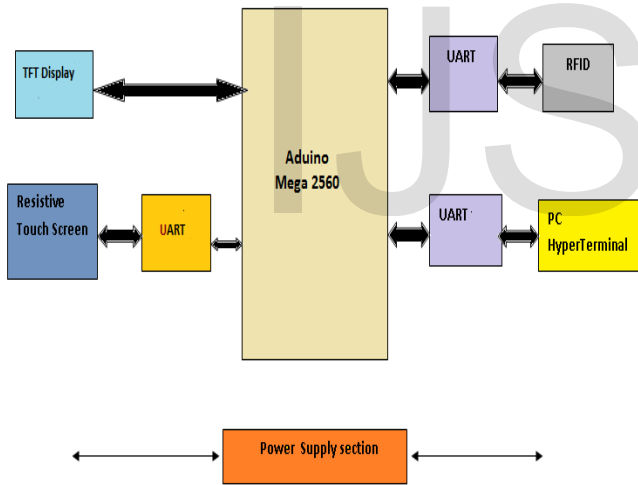


Fig.5 Block diagram

V. Future Scope

This project takes the order from the customer & lets him pay the bill without any human intervention. By making selection of microcontroller with large memory size depending upon the family and ROM size of the processor there is a great scope of advancement in this project. We can add graphic images by using SD card and a display with higher dimensions. With the help Internet of Things(IoT), we can easily place the order just by sitting at home.

VI. Applications

Now a days due to advancement of technology people are accustomed with touch screen interface. It is easily accessible by user to navigate by simply touching the display screen.

With slight modification in this project, this system can be widely used at different public places like at canteens, hospitals, public transport, college libraries, theatres etc.

VII. Conclusion

There is great advancement in technology due to its features like low cost and ease of use. This technology allows us a faster and more convenient access to the world. The Restaurant automation is a revolutionary concept & is sure to take people by surprise. This system is convenient, effective and easy thereby improving the performance of restaurant's staff. It will also provide quality of service and customer satisfaction. It will undoubtedly change the way people dine & their dining habits. It would lead to increased revenues; give the customer a better insight into the kind of food they wish to have, give them a great touch experienced.

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