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# Touch Screen Based Advanced Menu Display and Ordering System for Restaurants

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**Abstract:** The epidemic growth of wireless technology and mobile services in this epoch is creating a great impact on our life style. Some early efforts have been taken to utilize these technologies in hospitality industry. In this field, touch screen based advanced menu display and ordering system concept is a new innovative idea. The concept of this paper has perceived in mind on observing take away fast food outlets. It aims to automate the food ordering process in the restaurant and also to improve the dining experience of the customer. It aids at reducing the need for excess man power and time spent on giving manual order. The user friendly system of menu card and its usability is increased through simple navigation technique using Graphical Liquid Crystal Display (GLCD) and touch screen. It drives the output from a distant place through RF Module.

**Key words:** GLCD · RF Transceiver

## INTRODUCTION

The paper predominantly intents in designing completely automated menu in restaurants with the help of touch screen sensor and a GLCD to provide a dexterous environment. There is no need of a waiter to take the order from the table. The menu will be displayed cardinally on the desk and we can directly order the menu with the assistance of touch screen.

Touch screens provide swift access to all types of digital media, with no text-bound interface getting in the way. Faster input can mean superior service. A touch interface can effectively upsurge operator accuracy, shrink training time and promote overall operational efficiency. A properly designed touch interface can upgrade each operator's accuracy. Touch screens are hands-on in automation and has become even simpler with touch screen technology.

**Literature Review:** Jingjing Wang [1] presented the design and achievement of wireless ordering foods system. This paper presented in-depth on the technical operation of 4*4 matrix keyboard to realize data input.

N. M. Z. Hashim *et al*. [2] proposed the smart ordering system via Bluetooth (SOS). It uses a small keyboard to make orders and Bluetooth for transmission.

Prof. Sagar Soitkar *et al*. [3] presented the touch screen based digital menu ordering system using AVR. This paper dictates the method of low cost, efficient and easy to access the system for digital menu ordering system for restaurants.

Asan, N. Badariah *et al*. [4] developed zigbee–based smart ordering system. The smart ordering system is proposed orders using hand tools used to make an order in a restaurant.

Bhanu Siramshetti *et al*. [5]later on took one step ahead. They further extended the service with zigbee based E-menu ordering system. The development of the E-menu ordering is based on the software-hardware platform on ARM7(LPC2148), using zigbee short range radio communication technologies.

GuHui *et al*. [6]developed the design of touching wireless ordering dishes system based on WinCE. It overcomes the drawbacks of PDA based system. Terminals in hand have a large storage, high speed of data processing and friendly screen.

Kiran Kumar reddy *et al*. [7] employed combination of Bluetooth technology along with android phone. An android application was designed containing food item details in restaurant. The input device was smart phone or tablet and output section was PC. Cloud-based server for storing the data base was used which made it inexpensive and secure.

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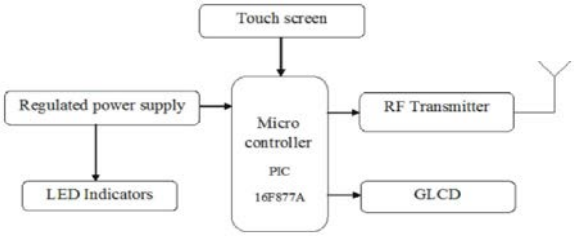
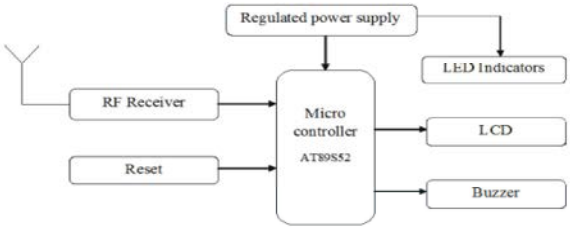
**Proposedsystem:** Aspiration of the proposed method is to develop a cost effective system which could work in small restaurants that are not willing to invest huge amount of money in these systems.

**Block Diagram:**

**Transmitter**




**Receiver**




**PIC16F877A Microcontroller:** PIC microcontroller is the first RISC supported microcontroller fabricated in CMOS (complementary metal oxide semiconductor) that uses isolated bus for instruction and data allowing simultaneous access of program and data memory. The main favor of CMOS and RISC consolidation is low power consumption resulting in a very small chip size with a small pin count. The essential advantage of CMOS is that it has immunity to noise than other fabrication techniques.


Fig. 3.2: PIC16F877A

Various microcontrollers offer disparate kinds of memories. EEPROM, EPROM, FLASH etc. are some of the memories, of which FLASH is the most freshly developed. Technology that is recycled in PIC16F877A is flash technology, so that data is maintained even when the power is switched off. Accessible Programming and Erasing are other features of PIC16F877A.

**Features:**

- High-performance RISC CPU
- Operating speed:
  - DC - 20 MHz clock input
  - DC - 200 ns instruction cycle
- Direct, indirect and relative addressing modes
- Power-on Reset (POR)
- Power-up Timer (PWRT) and Oscillator Start-up Timer (OST)
- Programmable code-protection
- Power saving SLEEP mode
- Low-power, high-speed CMOS EPROM/EEPROM technology

**AT89S52 Microcontroller:** The AT89S52 is a low-power, high-conduct CMOS 8-bit microcontroller. The device is manufactured using Atmel's huge-density nonvolatile memory technology and is consistent with the industry standard 80C51 instruction set and pin out. The on-chip Flash grants the program memory to be adjusted in-system or by a conventional nonvolatile memory programmer. By combining an adaptable 8-bit CPU along with in-system programmable Flash on a monolithic chip, the Atmel AT89S52 is a powerful microcontroller which equips a highly-flexible and cost-effective solution to many embedded control applications.

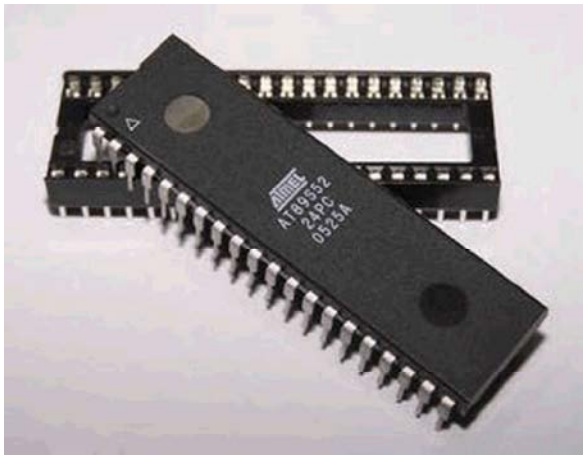



Fig. 3.3: AT89S52

The AT89S52 has 4 different ports, each one have 8 Input/output lines providing a total of 32 I/O lines. Those ports can be worn to output DATA and orders do other devices, or to interpret the state of a sensor, or a switch. Most of the ports of the AT89S52 have 'dual function' connotation that they can be used for two different functions.

**Features:**

- 131 Powerful Instructions – Most Single-clock Cycle Execution
- 32 × 8 General Purpose Working Registers
- Fully Static Operation
- Up to 16 MIPS Throughput at 16MHz
- On-chip 2-cycle Multiplier
- High Endurance Non-volatile Memory segments
- High-performance, Low-power
- Advanced RISC Architecture

**Touch Screen:** A resistive touch screen panel composes several layers, the most important of which are two thin, transparent electrically-resistive layers detached by a thin space. These layers face each other with a thin gap between.

Fig. 3.4: Resistive type touch screen

The elite screen (the screen that is touched) has a coating on the underneath surface of the screen. Just beneath it is a similar resistive layer on elite of its substrate. One layer has conductive connections along its sides, the other along top and bottom. A voltage is enforced to one layer and sensed by the other. When an object, such as a fingertip or stylus tip, presses down onto the outlying surface, the two layers touch to become linked at that point: The panel then operates as a pair of voltage dividers, one hinge at a time. By promptly switching between each layer, the position of a pressure on the screen can be read.

**RF Module:** RF module contains RF Transmitter and Receiver. The transmitter/receiver (Tx/Rx) pair operates at a frequency of 434 MHz. An RF transmitter gets serial data and transmits it wirelessly through RF through its antenna connected at pin4.

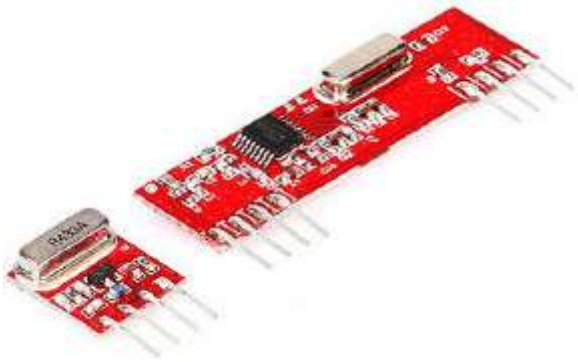


Fig. 3.5: RF Transmitter & Receiver

The transmission appears at the rate of 1Kbps - 10Kbps. The transmitted data is received by an RF receiver operating at the look-alike frequency as that of the transmitter.

**Features:**

- Range in open space(Standard Conditions) : 100 Meters
- Flat Power Consumption
- Easy For Utilization
- TX Frequency Spectrum : 433.92 MHz
- TX Supply Voltage : 3V ~ 6V
- TX Output Power : 4 ~ 12 dBm
- RX Frequency Spectrum : 433 MHz
- RX Typical Sensitivity : 105 dBm
- RX Supply Current : 3.5 mA
- RX IF Frequency Spectrum: 1MHz
- RX Operating Voltage : 5V

**Glcd:** The GLCDs are used to display customized characters and pictures. The GLCDs find use in several utilizations they are worn in video games, mobile phones and lifts etc., as in the form of display units. Various GLCDs are available in the market with different sizes and colors.

Fig. 3.6: 16*4 GLCD

This LCD has a display format of 128x64 pixels and has yellow-green color background light. Each LCD needs a controller to execute its internal processes. The 16x2 Character LCDs have their own restrictions they can alone display characters of assured dimensions.

## RESULTS

A Touch screen along with GLCD will be placed on each table. Now the GLCD will act as a menu card displays all the items accessible in the restaurant. The available menus are programmed in microcontroller.

According to customers demand he or she will select menus and quantity by using Touch screen placed over the GLCD. Directly the order will be transmitted over microcontroller to receiving module in kitchen. RF module is used for communication between transmitter on the table and receiver in cooking section in restaurant. In receiver section, the microcontroller takes the order which is advertised on LCD along with user desk number.

## CONCLUSION

The system equips with low cost, convenient and easy to use for order placement in restaurants. Now a day, due to enhancement of technology people are familiar with touch screen interface. It is easily accessible by user to operate by directly touching the display screen. By using this system restaurant staff cooperates more efficiently and the incidental errors are reduced. It will be easy and much comfortable to place any kind of order of customer's choice. This system is user-friendly, impressive and easy thereby improving the performance of restaurant staffs.

This system also ensures good quality of service and customer satisfaction. The proposed system has the potential to attract customers and also adds to the readiness of maintaining the restaurant ordering sections. Apart from this updating of menus can be done easily. Depending upon the family and ROM size of the microcontroller, the size of the menu list can be varied.

**Future Work:** In future, we can use this project in several applications by adding additional components to this project. By adding printer to either transmitter or receiver section, we can directly print the bill of the customers in billing section. Also we can connect a conveyor belt between the customer and kitchen section to serve the food to the customer. So there is no need of a server to supply food. Similar to the RF module, we can also use GSM module, Zigbee or Bluetooth technology for making wireless communication.

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