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Design and Implementation of IOT Based Smart Restaurant

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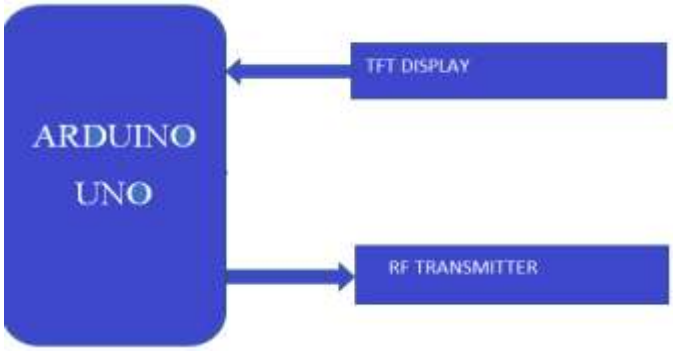
ABSTRACT: This paper presents the design and construction of a IOT Based Smart Restaurant. Automation plays a very important role in every field of human life. This project contains the proposal of a fully automated menu ordering system in which the paper based menu is replaced by a TFT display on which menu of restaurant is shown. Now day's automation systems are everywhere whether its home, office or any big industry, all are equipped with automation systems. Restaurants/Hotels are also adopting recent automation trends and are installing robots to deliver food and tablets for taking orders. Using these digital menu cards like tablets, customers can easily select the items. This information will be sent to the kitchen of the Restaurant and also displayed on the display.
In this project, we are building a Smart Restaurant Project using Arduino, TFT display, and 433MHz RF transmitter/receiver module. Here the transmitter section will consist of Arduino Uno, TFT display, and an RF transmitter, using which customers can select the food items and place the order. While the receiver section consists of an Arduino Uno, LCD module, RF receiver, and a Buzzer, which will be installed in the restaurant kitchen to track the order items.

I. INTRODUCTION

The system has arduino uno and TFT display and RF transmitters to transmitted the customer order to restaurant management. which takes the input from the user and provides the same information to the ardiuno. The output module is a RF module which is used for communication between system at the table and system for receiving section. At the receiving end the selected items will be displayed on the LCD and by using the RF receiver. the received order will send to the particular table.

In Transmitter :-

Smart Restaurant consists of RF Transmitter and Receiver section. Both the transmitter and receiver side uses Arduino Uno for data processing. The transmitter section of this project consists of an Arduino Uno, RF Transmitter, and TFT display shield. This section is used for ordering from the menu that is shown on the TFT display.



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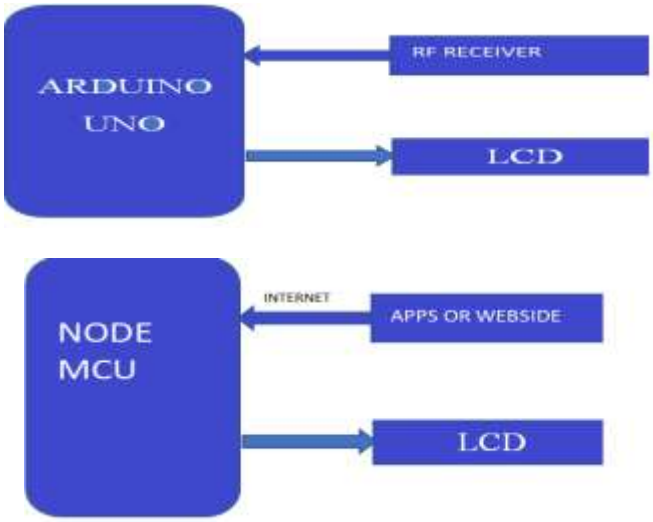
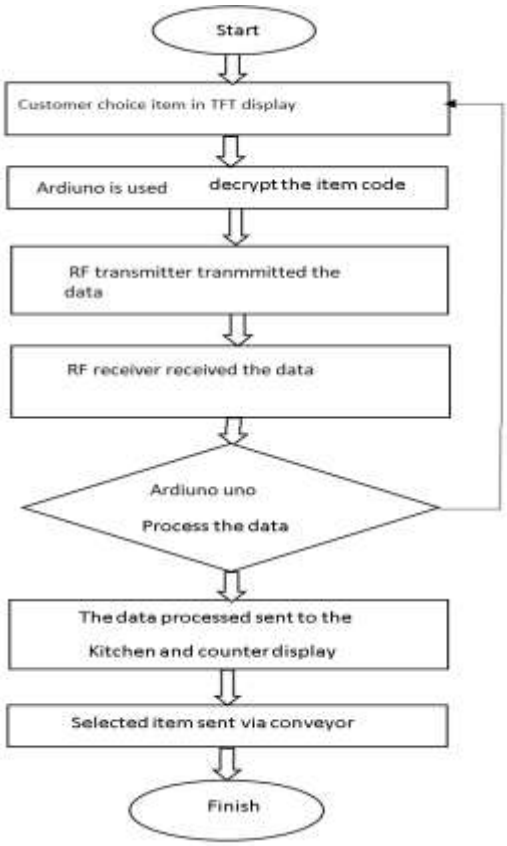
- **In Receiver :-**

RF receiver is used to receive the data from the transmitter section, and the LCD module is used to display the received data. A buzzer is used to make a sound whenever a new order is placed.



Flow diagram of project :-

- **From home apps or website is used for order. nodemcu is used which makes it an IOT based.**



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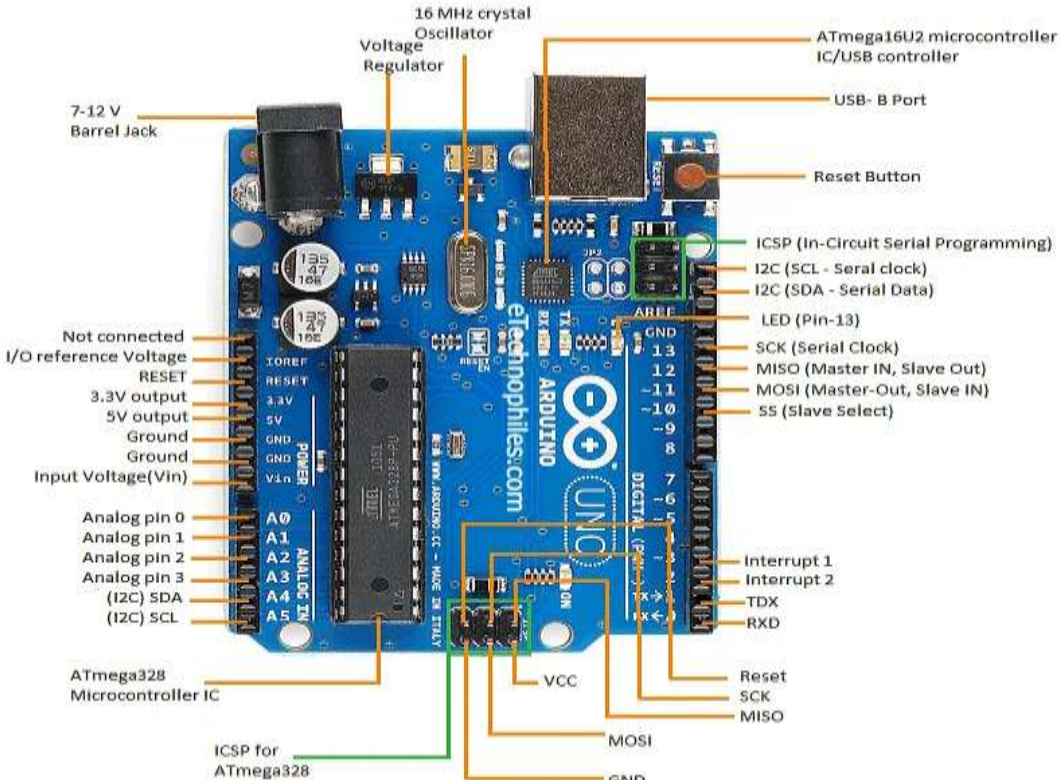
Circuits Components:-

1. Arduino UNO



Arduino Uno is a microcontroller board based on an 8-bit ATmega328P microcontroller. Along with ATmega328P, it consists of other components such as crystal oscillator, serial communication, voltage regulator, etc. to support the microcontroller. Arduino Uno has 14 digital input/output pins (out of which 6 can be used as PWM outputs), 6 analog input pins, a USB connection, A Power barrel jack, an ICSP header and a reset button.

Arduino can be used to communicate with a computer, another Arduino board or other microcontrollers. The ATmega328P microcontroller provides UART TTL (5V) serial communication which can be done using digital pin 0 (Rx) and digital pin 1 (Tx). An ATmega16U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The ATmega16U2 firmware uses the standard USB COM drivers, and no external driver is needed. However, on Windows, a .inf file is required. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the Arduino board. There are two RX and TX LEDs on the arduino board which will flash when data is being transmitted via the USB-to-serial chip and USB connection to the computer (not for serial communication on pins 0 and 1). A SoftwareSerial library allows for serial communication on any of the Uno's digital pins. The ATmega328P also supports I2C (TWI) and SPI communication. The Arduino software includes a Wire library to simplify use of the I2C bus.

2. 433MHz RF Transmitter & Receiver

This one is a receiver module. Though it looks complex, it is as simple as the transmitter module. It consists of a RF tuned circuit and a couple of OP Amps to amplify the received carrier wave from the transmitter. The amplified signal is further fed to a PLL (Phase Lock Loop) which enables the decoder to "lock" onto a stream of digital bits which gives better decoded output and noise immunity.

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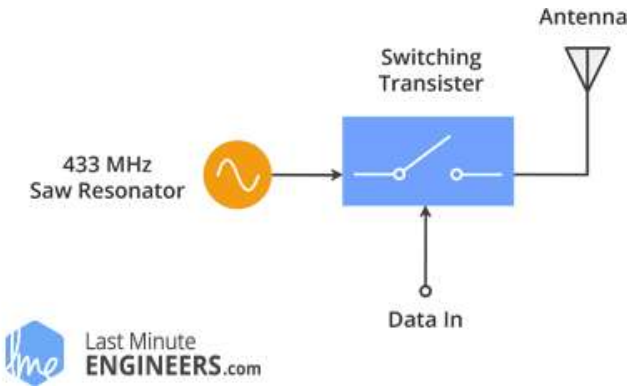

2.4" TFT LCD Touch shield

The role of screens in electronic projects is very important. Screens can be of very simple types such as 7 Segment or character LCDs or more advanced models like OLEDs and TFT LCDs.

2.4" TFT shield is one of the most widely used graphic screens. Here are its most important features:

- 240*320 pixels resolution
- Ability to display 262000 different colors
- Includes a touchpad
- 5v supply voltage

Arduino pins 2, 3, A5, and A4 are free and you can use them to connect this shield.

16*2 LCD Module

Features of 16×2 LCD module

- Operating Voltage is 4.7V to 5.3V
- Current consumption is 1mA without backlight
- Alphanumeric LCD display module, meaning can display alphabets and numbers
- Consists of two rows and each row can print 16 characters.
- Each character is build by a 5×8 pixel box
- Can work on both 8-bit and 4-bit mode
- It can also display any custom generated characters
- Available in Green and Blue Backlight

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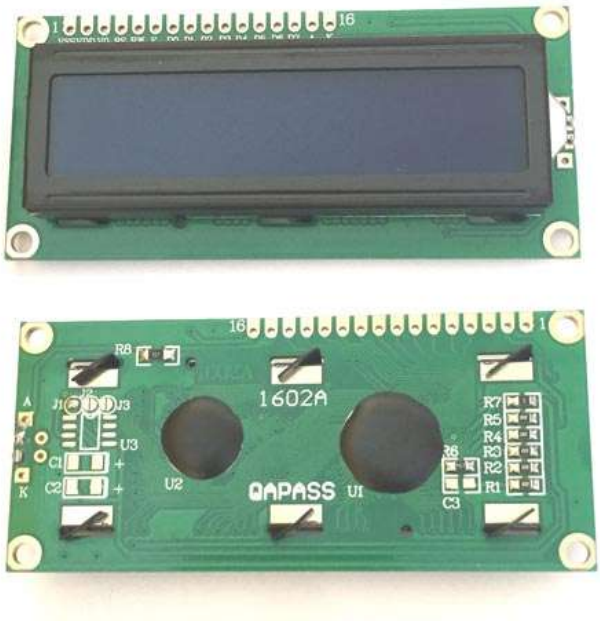

I²C Module

I2C Module has a inbuilt PCF8574 I2C chip that converts I2C serial data to parallel data for the LCD display. These modules are currently supplied with a default I2C address of either 0x27 or 0x3F. To determine which version you have check the black I2C adaptor board on the underside of the module. If there a 3 sets of pads labelled A0, A1, & A2 then the default address will be 0x3F. If there are no pads the default address will be 0x27.

The module has a contrast adjustment pot on the underside of the display. This may require adjusting for the screen to display text correctly.

Features:-

- Operating Voltage: 5V
- Backlight and Contrast is adjusted by potentiometer
- Serial I2C control of LCD display using PCF8574
- Come with 2 IIC interface, which can be connected by Dupont Line or IIC dedicated cable
- Compatible for 16x2 LCD
- This is another great IIC/I2C/TWI/SPI Serial Interface
- With this I2C interface module, you will be able to realize data display via only 2 wires.

II. CONCLUSIONS

We conclude and make recommendations in this section based on our results. Automation plays a very important role in every field of human life. This project contains the proposal of a fully automated menu ordering system in which the paper based menu is replaced by a TFT display on which menu of restaurant is shown. Now day's automation systems are everywhere whether its home, office or any big industry, all are equipped with automation systems. Restaurants/Hotels are also adopting recent automation trends and are installing robots to deliver food and tablets for taking orders. Using these digital menu cards like tablets, customers can easily select the items. This information will be sent to the kitchen of the Restaurant and also displayed on the display.

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III. ACKNOWLEDGMENT

Our project would not have been possible without the guidance of Prof. Sulekha Saxena (Assistant Professor, ECE department, IMS Engineering College, UP, India) and other faculties , lab assistance of ECE department , IMSEC for their technical support and constant supervision which contributed immensely to project development. Last but not the least, special thanks to all my friends for sharing their experience in completing this project.

REFERENCES

[1]. https://create.arduino.cc/projecthub
[2]. https://www.electronicshub.org
[3]. https://www.ledsmagazine.com/leds-ssl-design/materials/article/16701292/what-is-an-led
[4]. https://create.arduino.cc/projecthub/babariyasmit/bidirectional-digital-visitor-or-person-counter-055f47
[5]. IDE - Arduino IDE - https://www.arduino.cc/en/software
[6]. https://www.mepits.com/tutorial/379/electrical/motor-driver
[7]. http://electronicshub.com/microcontroller-projects/automatic-room-light-controller-with-bidirectional-visitor-counter-using-arduino.
[8]. Alkar, A. Z., & Buhur, U. (2005), An Internet Based Wireless Home Automation System for Multifunctional Devices, IEEE Consumer Electronics, 51(4), pp. 1169-1174.