

Implementation of E-Menu Card for Restaurant using LoRa Technology

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Abstract— The paper is proposed with the LoRa technology as the communication medium which implements faster ordering system. The technology able to solve lack number of worker reduces the error on ordering foods by the customers [1]. The e-menu food ordering system is based on software-hardware platform of Arduino and using LoRa technology long range radio communication technologies. We have divided the system in two sections one is handheld section (customer section) and other is main section (owner section), both section consists of LoRa transceivers. At handheld section character LCD with switch is provided to place the order and order sends further to main section via LoRa transceiver. Simultaneously buzzer will indicate that order has arrived and LCD display which is at main section is used to display food menu order and cost.

Keywords: Arduino, LCD, LoRa

I. INTRODUCTION

Today's method of menu ordering system includes more human efforts for getting an order from the customer,[2] by giving the customer a menu card on their table and also billing is a special attention need to pay for every table and their orders. Hence, the menu ordering through an electronic system interface will get an ultimate response from the users due to the time saving methodology and smarter way to communicate. The wireless communication interface will provide a faster and accurate data transmission in a low cost [3]. The main aim to implement this e-menu ordering system is its user friendly interface as well as to reduce human efforts.

The implementation of electronic menu ordering systems may have some differences in interface design and methodology. The LoRa communication is used as wireless interface and the character LCD display with is used as customer interface. In the recent past there has been evolution in ordering and serving system but still the results are not very much promising. With the advancement in communication technology the issues of being late entertained can be solved. In order to effectively run a restaurant, time saving and cost optimizations are essential. Reduction in time by a few seconds for each table can speed up order processing, increase efficiency and boost profits.

II. SYSTEM DESIGN

The e-menu food ordering system is divided into two sections,

- 1) Main section
- 2) User section.

Main section is also called as owner section. User section is work for customer

A. Table E-Menu Card Transmitter Part:

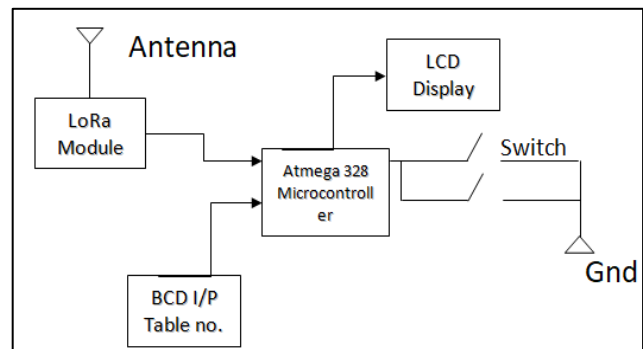


Fig. 1.1: E-Menu card Transmitter

B. Manager & Kitchen Receiver Part:

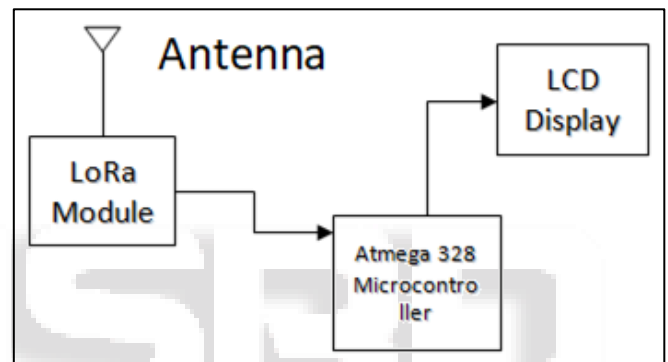
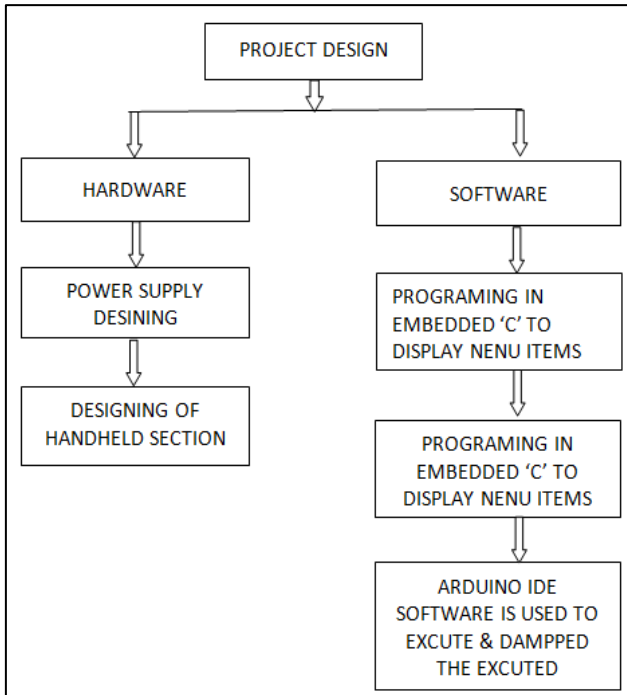


Fig. 1.2: Manager & Kitchen Receiver

This paper introduces one main section (counter) and one handheld section (customer). In the customer section, we have one LCD display through which customer can place his/her order), Arduino Nano and LoRa transmitter/receiver. LoRa transmitter transmits the ordered data to LoRa receiver of main section. Design of transmitter section is using Arduino (ATMEGA328) and LoRa transceivers. Transmitter section is for customers, Using LCD they will place their food order. And order will further sent to Manager and Kitchen section. It is an embedded system which is to be installed on every table in the restaurant. A LCD display is provided on each of the table, LoRa transmitter on user side, a LoRa receiver and LCD on another side. Our switch is made up of X coordinate and Y coordinates. Switch is divided into three rows and two columns, so we can place six item lists on front desk. By pressing on a particular item from the list we get a particular value of X, Y coordinates Depending upon these value we came to know in which row and column it is pressed.

III. PROPOSED METHODOLOGIES



A. Hardware

1) Arduino ATmega328p:

- a) Technical specifications of the Arduino board
 - Microcontroller ATmega328
 - Operating Voltage (logic level): 5 V
 - Input Voltage (recommended): 7-12 V
 - Input Voltage (limits): 6-20 V
 - Digital I/O Pins: 14 (of which 6 provide PWM output)
 - Analog Input Pins: 8
 - DC Current per I/O Pin: 40 mA
 - Flash Memory 32 KB (ATmega328) of which 2 KB used by boot loader
 - SRAM: 2 KB (ATmega328)
 - EEPROM: 1 KB (ATmega328)
 - Clock Speed: 16 MHz
 - Dimensions: 0.73" x 1.70"

2) LoRa module:

- a) SX1278 LoRa Module Specification433M Quick Specification
 - Communication distance: 10KM
 - Sensitivity: down to -148dBm
 - Programmable bit rates: up to 300kbps dynamic range: 127dB
 - Wireless frequency: 433MHz
 - Working voltage: 1.8-3.7v
 - Working temperature: -40+80 °C
 - LoRa™ Spread Spectrum modulation technology
- b) 16 x 4 Character LCD Features
 - Type: Character
 - Display format: 16 x 4 characters
 - Built-in controller: ST 7066 (or equivalent)
 - Duty cycle: 1/16
 - 5 x 8 dots includes cursor
 - + 5 V power supply (also available for + 3 V).

B. Software

1) Embedded C

Programming requires nonstandard extensions to the C language in order to support features such as fixed-point arithmetic, multiple distinct memory bank and basic I/O operations.

IV. SCOPE OF PROJECT

In today's Generation whenever we visit a restaurant, a waiter comes with a note and pen and takes an order in it[4]. In this traditional way there are chances of misinterpretation of order so there is an automated food ordering system which manages all orders of customers. In this system, Tablet is provided on each table through which customers can place their order which will be displayed on screen in a kitchen, and once order will be ready waiter can serve on the respective table. Records of customers are kept at cashier side for bill payment and further use.

V. ADVANTAGES

- 1) Greater flexibility in menus.
- 2) Increase in restaurant productivity
- 3) Less time consuming.
- 4) Reduces efficiency of catering enterprises.
- 5) Menu updates can be rolled out at any time with no extra labor from printing and distributing new menus (allowing for more dynamic pricing and content changes)
- 6) Accuracy ensured as the software system takes responsibility for a customer's order.

VI. APPLICATIONS

- 1) Designed for hospitality management.
- 2) Cinema halls.
- 3) The E-menu ordering is mainly applied to middle and small hotels. (E.g. collage canteen, Airlines).

VII. CONCLUSIONS

The implemented system of restaurant menu ordering system is a modern and smart solution for menu ordering methods in any kind of restaurant [5]. The system will reduce the manual efforts and also gives more accuracy in calculating the bill for each individual table. It is also a low cost alternative to be used by middle and low level restaurants also. And the proposed system will help in reducing the number of staffs used in the restaurant and also helps to give fast service hence will help in considerably reducing cost and efficient service of restaurant Management [6].

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