Implementation of Smart Restaurant with E-Menu Card

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ABSTRACT

Normally in restaurants menu order system is actual provided in menu card format so that customer has to collect the menu item then the waiter has to come and take the order, which is long process. So we designed this paperless restaurant system that displays food items for customers on their available devices such as user phone, tablet etc.The Digital Menu for Restaurants project aims improve this situation. Consumers today are adapted to interact with computer systems in many aspects of their day today life.We can see these automation system partially when you for KFC or McDonalds or Dominos. There when we order they are noted in the system and it is sent to their kitchen. When our order is ready our token number is announced. With this system we don't need to wait for the server to take the order. A tab is provided withmenu instead of a paper menu. This system successfully overcomes the drawbacks in earlier automated food ordering systems and is less expensive as it requires a one-time investment for gadgets.This wireless application is user-friendly,improves efficiency and accuracy for restaurants by saving time, reduces human errors and provides customer feedback.

DOI Number: 10.48047/nq.2024.22.5.nq25043 **NeuroQuantology 2024; 22(5):441-446**

1. INTRODUCTION

The advancement of Information and Communication Technology has led to an increasing number of industries to use electronic media and corresponding application for information exchange. In the restaurant sector, Modern wireless device such as Personal Digital Assistant (PDA) has been adopted into restaurant system to replace the conventional way of taking orders using pen and paper. However, the PDA-based food ordering system has known limitations such as the requirement of training of attendants, the need of having attendants to operate, the inefficiency during peak hours and small screen size and the Multitouchable restaurant Management System has limitations such as touch screens used are of mostly capacitive type or resistive type which are costly. Hence by introducing an application loaded in an android Smartphone or tablet containing the menu details these limitations can be overcome.

Even today also restaurants use the common manual process of using waiter waiting to take order with pen and paper. In this traditional pen and paper the waiter writes down the order according to the customers which then is given to kitchen chefs, keeps records of it and then makes bill. This process is simple and common but may result in human errors. The waiter may mistake in noting the customer orders or may provide late order taking and late food serving which may result in customer dissatisfaction and restaurant losses. To solve this drawbacks on manual process paperless restaurant system is proposed to manage the overall food ordering and serving process.It reduces customer's time for waiting. So customers don't have to wait for the waiter to take the order.

Rapid growth wireless telecommunications and network leading industries are gaining customers daily. The goal of all computerized systems is to provide fast services to customers in less time while also reducing human effort. To survive this competition, restaurants must provide the best services and maintain relationships with their customers [3]. Today, the food industry is a multibillion-dollar industry with a higher growth rate than any other industry. However, the foodservice industry is unable to keep up with this growth. The standard of service has deteriorated.

You often hear horror stories about rude service, long wait times, mixed-up orders, and so on. To gain revenue, service quality has deteriorated. The main reasons for this are a lack of proper infrastructure, an overburdened workforce, low-profit margins, and fierce competition

2. RELATED WORK

They have a contactless food ordering system in a mobile application operated by a voice assistant.Design and implement with inter restaurant navigation using android technology.A digital food ordering system and food will be delivered to customers using a robot- controlled via a wireless transmitter.Designing a completely automated menu system in restaurants with help of transmission of data is through Zig-bee which is a wireless technology. Digital ordering system on android using GSM and Bluetooth for restaurants.The system model of our prototype is as shown below.The main aim is to come up with the idea of “IMPLEMENTATIONSMART RESTAURANT WITH e-SERVICE.E-menu can be interactive and visually appealing, and provide detailed information about ingredients and allergies. It also help restaurants save time and reduce human error.

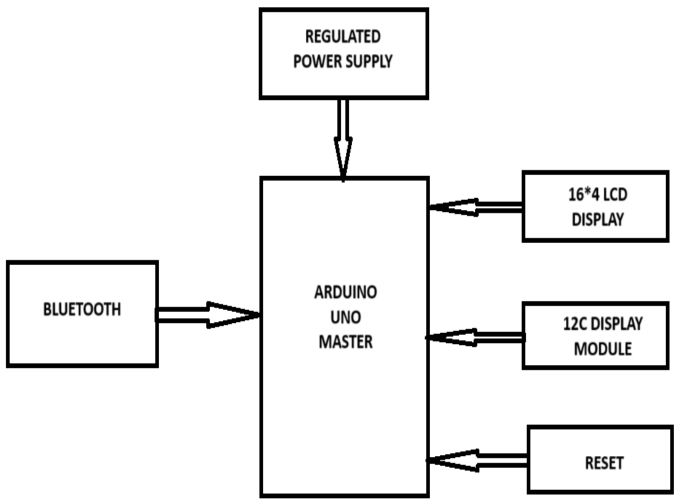

Figure 1: System with Service Provider

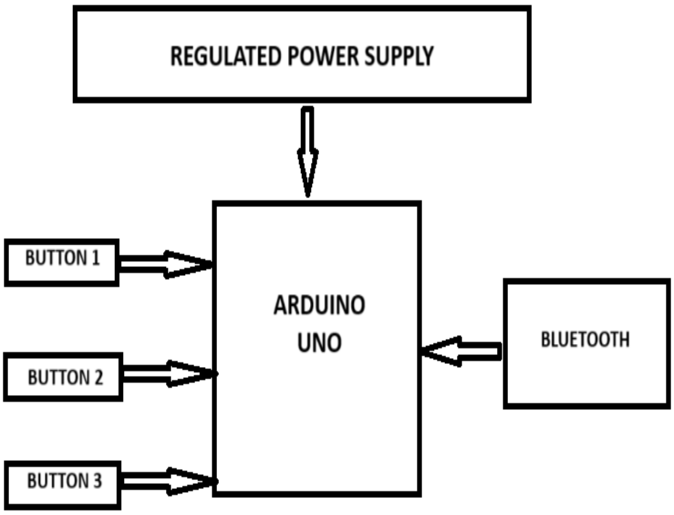

Figure 2: System with customer

Figure 3 : ARDUINO UNO

Arduino Uno is a microcontroller board based on the ATmega328P . It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter orbattery to get started.

ESP-01 (8266): The ESP8266 ESP-01 is a Wi-Fi module that allows microcontrollers access to a Wi-Fi network. This module is a self-contained SOC (System On a Chip) that doesn't necessarily need a microcontroller to manipulate inputs and outputs as you would normally do with an Arduino, for example, because the ESP-01 acts as a small computer.

Figure 4: LIQUID CRYSTAL DISPLAY

Liquid Crystal Display (LCD): A 16x4 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on. Push Button Switch: Push Button Switches consist of a simple electric switch mechanism which controls some aspect of a machine or a process. Buttons are typically made out of hard material such as plastic or metal.

For Smart Restaurant Food Menu System project 16×4 LCD acts as display device. ESP01 module acts as a communication device. Push button output will go to arduino device then after processing arduino it will send message to LCD. Message will also go to ESP01 module through UART communication that is RX and TX. The code where written in such a way once the message reached it will display it in the LCD. Wi-Fi technology is being used to send message in working area.

SOFTWARE IMPLEMENTATION

Firmware implementation deals in programming the microcontroller so that it can control the operation of the IC's used in the implementation. In the present work, we have used the Altium Designer software for Printed Circuit Board (PCB) circuit design, the Arduino software (IDE) software development tool to write and compile the source code, which has been written in the C and JAVA language. The Arduino compiler has been used to compile code into HEX file into the Arduino.

2.1 Software Tools Required

- ARDUINO 1.6
- B4J for UI
- PROTEUS
- ALTIUM DESIGNER for PCB design

ARDUINO 1.6 is specifically use for compiling program, B4J and PROTEUS are the two software tools for virtual simulation.

In the design of the hardware and software sections, an experiment was carried out to validate the results, in the transmitter section of the proposed system, where the hardware components interfaced with each other for services that have been opted from the user.

The signals are read from the transmitter section, and the receiver part of the system listens to the data and displays it on an LCD situated in the kitchen area or receiving section.

3. RESULT

Figure 5: Proposed output

The output displays as three buttons, as the first button is used for adding items as we type from(A-F), the second button is used for deleting items as we type from (1-6), third button is used for reset.These requirements are displayed in the system which is kept at kitchen. The total cost of the items are also displayed when we are adding the items.So that the chefs can make the items that constumers requirement without wasting any time and paper.

4. CONCLUSION

We developed a restaurant with e-service implementation. This methodology will be in high demand in every aspect of life. The proposed system's primary goal is to develop a wireless hotel service system with customer interrelationships. The system provides a convenient and user-friendly environment for customers. The customer uses the portable device to select their service and is displayed on the other end, which is the receiver side through the nRF24L01 wireless communication module.It is a practical, powerful, cost-effective, and adaptable system that has the potential to boost the overall productivity of the foodservice industry. The system is designed to provide pleasant service and satisfy customers. It will surpass people's dining styles and habits. This can bring more revenue for restaurants while customers select their respective needs and give them a top-notch interactive experience.Thus, the system brings advancement in the field of the food industry by automating the system through mobile and wireless technology. It has the potential to attract customers and change their dining experience in a better and more efficient way. The portable device has three switching nodes with services and the data is transferred with the help of the wireless network and data is displayed on the LCD successfully demonstrated.

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