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E MEMU CARD SYSTEM IN INTELLIGENT E RESTAURANTS IN SMART CITIES

[1]PANDI SWATHI, [2]ITHA MANASA,[3]BIGALLA CHANDANA,[4]BANOTH PUJITHA,[5] Dr.RAJEEV SRIVASTAVA

[1,2,3,4]Student, Department of ECE, PRINCETON INSTITUTE OF ENGINEERING AND TECHNOLOGY FOR WOMEN

[5]Assistant Professor, Department of ECE, PRINCETON INSTITUTE OF ENGINEERING AND TECHNOLOGY FOR WOMEN

ABSTRACT

In today's technologically advanced era, various industries, including the restaurant sector, have adopted modern information and communication technologies to enhance user experiences. Restaurant owners have integrated devices such as PDAs, wireless LANs, and multi-touch screens to improve the dining experience. This paper addresses the limitations of traditional paper-based and PDA-based food ordering systems, proposing a low-cost, touch-screen-based Restaurant Management System using an Android smartphone or tablet as an alternative solution. The system involves a tablet or smartphone at the customer's table, equipped with an Android application that provides all menu details. The customer device and kitchen display connect through Wi-Fi, allowing orders placed by customers to be instantly sent to the kitchen. This wireless application is user-friendly, improves restaurant efficiency, reduces human errors, saves time, and enables customer feedback. The proposed system overcomes the drawbacks of earlier automated food ordering systems and proves to be cost-effective, requiring only a one-time investment in hardware.

Keywords: Smartphone, Automated, Wi-Fi, E-menu, Android Application, Intelligent Ordering.

I.INTRODUCTION

The advancement of Information and Communication Technology (ICT) has led many industries to shift towards electronic media for information exchange. In the restaurant industry,

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modern wireless devices such as Personal Digital Assistants (PDAs) have replaced the traditional pen-and-paper methods of taking orders. However, PDA-based systems come with several limitations, such as requiring attendant training, the need for staff to operate the system, inefficiencies during peak hours, and small screen sizes. Additionally, multi-touch systems are often costly, using capacitive or resistive touchscreens. This project introduces a cost-effective, Android-based solution to these challenges. The system uses an Android smartphone or tablet loaded with an application containing the restaurant's menu, allowing customers to place orders directly from their tables using Wi-Fi connectivity. Android, a software stack for mobile devices, offers a range of connectivity options like Wi-Fi and Bluetooth, along with a variety of libraries and tools for building rich applications. The project aims to design a completely automated menu system for restaurants, using Android devices, Wi-Fi modules, and LCD displays. Customers can use the system to view the menu on their devices and place orders directly, eliminating the need for a waiter to take orders.

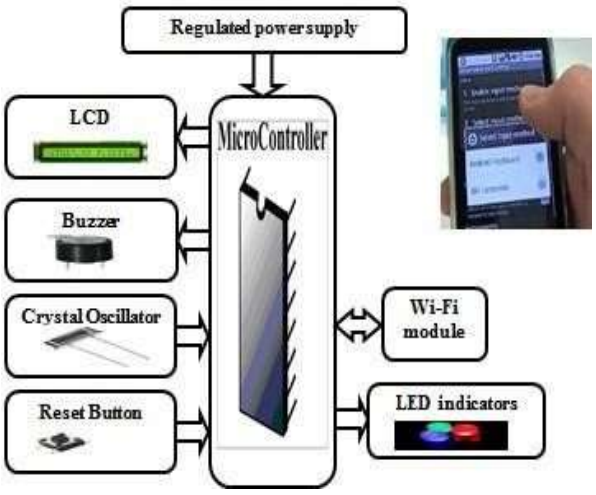

Fig1 : System architecture

II. PROPOSED WORK

This paper proposes integrating touch technology in restaurants using Android devices for a wireless food ordering system. Android has revolutionized mobile technology, making it popular for automating routine tasks in a wireless environment In the proposed system, Android tablets will be provided at customer tables. These tablets, owned by the establishment, will allow customers to view the menu and place orders directly. The tablets communicate wirelessly with the kitchen, sending orders instantly.

III. SYSTEM OVERVIEW

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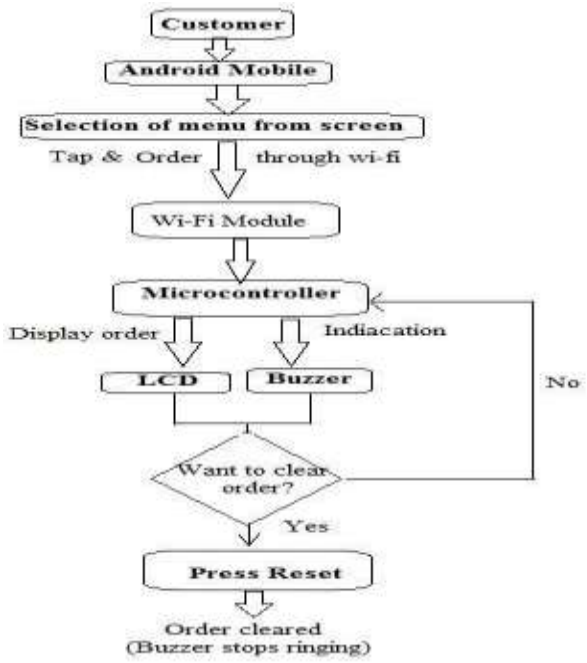
The project utilizes an ARM LPC2148 microcontroller, a 64-pin controller from the ARM7 family designed for high-performance applications. The microcontroller's RISC architecture ensures excellent performance with low power consumption, making it suitable for this system. The LPC2148 board includes a 60 MHz crystal oscillator, LEDs for indication, and a Wi-Fi module for connectivity. The Wi-Fi module transmits data via radio frequencies in the 2.4 GHz band, offering data speeds of 1-2 Mbps with a range of 40-300 feet. An LCD display is used in the kitchen to display orders, and a buzzer indicates when a new order is received.



IV. METHODOLOGY

The methodology for this project involves integrating an Android-based application with wireless communication technology to streamline the food ordering process in restaurants. Each table is equipped with an Android tablet or smartphone loaded with an application that displays the restaurant's menu. To create the wireless network, a secondary Android phone is used to enable the hotspot, allowing the customer devices to connect through Wi-Fi. Once the system is powered on, the microcontroller (ARM LPC2148) initializes, and a buzzer and LED provide initial system feedback, indicating successful connection with the Wi-Fi module.The customer interacts with the system by launching the menu application on their device, entering the necessary IP address and port number to access the restaurant's network. The menu is visually presented with images of the available items. Upon selecting an item, the command is sent wirelessly to the microcontroller, which processes the order. This command is then relayed to the kitchen, where the order details are displayed on an LCD screen. A buzzer sounds to notify kitchen staff of the new order. The embedded C code within the microcontroller governs this process,

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ensuring seamless communication between the customer's device and the kitchen display system. This methodology eliminates the need for waitstaff to manually take orders, enhancing efficiency and reducing the likelihood of error.

V.ADVANTAGES

1. Low power consumption.
2. Eliminates the need for wait staff to take orders.
3. Long lifespan and durability.
4. High sensitivity and responsiveness.
5. Easy to install due to wireless interfaces.
6. Android-based touchscreen smartphone use enhances usability.
7. Multilingual support for menus.

VI.CONCLUSION & FUTURE SCOPE

The system integrates all necessary hardware and software components to develop a smart restaurant solution. Each module is carefully implemented to ensure the best performance. Using advanced technology and components, this project successfully delivers a functional wireless food ordering system.

In the future, the system could be expanded with graphical LCDs to display menus, but this would make the system bulkier and more delicate, as each table would require a separate module for ordering.

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