

An Android Based Restaurant Automation System with Touch Screen

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Abstract—In this paper, we propose an android based restaurant automation system. The main aim of the project is to make the restaurant management easier. Recently in most of the restaurants, the ordering and delivery of food items are doing manually, the disadvantages are huge time consumption, and in some cases the customers aren't delivered the right item at right time these cause many problems. Hence we thought of automating this procedure using modern electronic technology. Here the individual tables in the restaurant are provided with a touch screen, represent each individual digital menu, and it facilitates the ordering. The customer can see all the available food items with its cost in the digital menu and can select the item. The order from each table is received in the kitchen wirelessly by Bluetooth. The electronic menu system helps the people to select the food from the rolling screen of android touch screen and to see the cost and recent availability of food items, and showing table number also. By using a thermal printer taking bill from the kitchen and the hotel staff can read the items from each table. If the food is ready in the kitchen it can be indicated to corresponding customers table by an LED glow.

Index Terms—Restaurant Automation, electronic food ordering system, Android based food ordering, Touch technology based food ordering

this is by all account not the only issue here. It's likewise difficult to propel individuals consistently, in light of the fact that the client benefit in restaurants may get to be exceptionally distressing. The greater part of the anxiety happens when one client administration part needs to deal with much an excess of clients on the double. Our venture concentrates on the request process, the kitchen association and business methodology like receipt administration intends to help methodologies required for the restaurant staff and permit them to concentrate on the essential part inviting client benefit and gives an advanced administration framework to each of these courses of action henceforth Adapting this objective for the clients this task expands the general experience at the following trek to a restaurant [4]. Tables where every client come and hold up for a server to come and request menu. He takes it and before long accompanies the requested things. The time deferral happening because of this is a genuine offense. There are situations when the thing conveyed may be off base and reasons numerous issues. Our framework has been created to beat these issues.

I. INTRODUCTION

The express development in communication innovation rise of wireless engineering and android gadgets has made very much a blend in the business exchanges., however the restaurant business hasn't passed through numerous huge changes .In such circumstance likewise there exist a territory that was not enhanced since a few decades engineering is changing the way we do just about everything .The Digital Menu for Restaurants venture intends to enhance the current circumstance [1] [2]. Buyers today are adjusted to communicate with machine frameworks in numerous parts of their regular life. Now and then we very much want them to customary routines, particularly when they help to give quick and helpful administration. A standout amongst the most import ranges for the restaurant business is clearly the client administration. To captivate amicable and obliging administration staff is most trying for the greater part of restaurant directors [3]. Anyhow

II. RELATED WORK

In [5], the authors outlined and actualized a customizable electronic food ordering arrangement which can collect real-time feedback from customers (CWOS-RTF). The technique called CWOS-RTF enables the restaurant managers to setup the system and update menu presentations easily in a wireless environment. A smart telephone has been incorporated into the CWOS-RTF to encourage real-time communication between restaurant holders and customers. An initial testing recommends that the CWOS-RTF can possibly overcome the impediments of existing food ordering systems. This CWOS-RTF has been made using both the programming languages, Asp.net and Vb.net. The database of the system has been laid out using Microsoft Access 2008. A private login system in this extend, the customers can view and ask and get updates in real-time and accumulate receipts from the smart telephone itself. It enables restaurant managers to oversee demands from

customers immediately at whatever point they logged in into the system.

A point of sale (PoS) management system with automatic order function on a personal digital device has been proposed by Kashima et. Al in [6]. The objectives of this system were safety of menu in restaurant, pursuit of service, improvement of operational efficiency by tracking food management, accounting, ordering etc. In this system, the recommendation of menu was according to the preference of users by using rough sets and the menu planning was based on stock status by applying information recommendation technology. The authors claimed that the personnel expenses of restaurant holders have been reduced by the improvement of operational frequency.

The project mentioned in [7] comprises of two units, A GLCD based menu card on the customers table for food ordering and a LCD unit at the kitchen for showing the request from customers to the Kitchen staff. Also a conveyor belt appended to stepper motor for automatic serving of dishes. The primary working standard of this assignment is that it works on at radio frequency transmission and reception. The creators guaranteed that, by utilizing such structures at the restaurants, it will be simple and much agreeable to put any sort of demand of customers choice, for the customers as well as management staff.

Cheong et.al. [8] describes the implementation of a System called MEMS with an aim to renovate the service on dining table. The MEMS comprises of an interactive menu with multi-touchability that enables customers to view and order sustenance over the dining table and the orders will be wirelessly transmitted directly to the server in real-time. The MEMS enables different staff personnel to access the centralized server to perform every day works digitally in a systematic work process. In short, the MEMS whenever implemented properly, could improve the overall restaurant efficiency, reducing the cost of labour, providing a better nature of services and enhance customers' dining experience.

A simple and progressively unobtrusive method for conveying to understand a wireless system for food ordering has been developed in [2]. This system, actualizes wireless access to the servers and food ordering tasks through the both desktops and mobile devices, for example, tablets over a wirelessly integrated LAN. This application keeps running on devices, for example, tablets which gives handiness, enhances productivity and precision of restaurants by sparing time and diminishing human errors.

The design and implementation of digital dining in restaurants utilizing android innovation has been discussed in [9]. This system is a simple dynamic database utility system which brings all information from a centralized database. The mobile device at the customer table contains the android application with all the restaurant and menu subtleties. The customer tablet, kitchen display and the cashier counter associates specifically with one another through Wi-Fi. This wireless application is easy to use, enhances efficiency and precision for restaurants by sparing time. It diminishes human errors and

gives customer feedback. This system effectively defeats the disadvantages in prior automated nourishment ordering systems and is less expensive as it requires a onetime speculation for gadgets.

The framework in [10] will permit the client to view menu things and request them as needs be. The supports might be midway joined with a focal server where genuine brought together request handling of all customers is possible. A solitary overseer can see all the requests from this incorporated server. The framework additionally spares time for both clients and hotel manager for request position.

The limitations of PDA [11]–[13] and MEMS [8] based food ordering systems has been highlighted in [1]. As a solution, the authors proposed a low cost MTRM System. It comprises of a multi-touchable device with menu at the client side. The touch requests made by the customers will be forwarded to a centralized data base and forwarded to the cashier and kitchen modules. The manager of the restaurant can deal with all the operations and can erase or oversee the all the activities.

III. PROPOSED WORK

Block diagram consist of two section ordering section and dispatching section and are shown in Fig.1 and Fig.2.

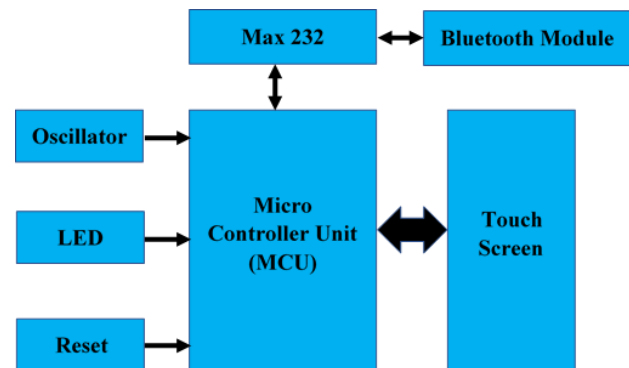


Fig. 1. Block Diagram of Ordering Section

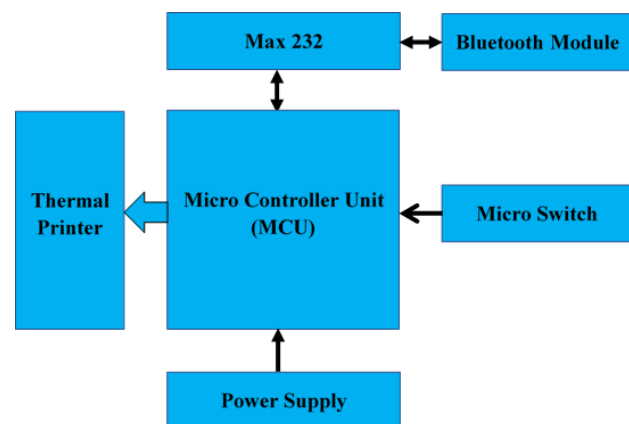


Fig. 2. Block Diagram of Dispatching Section

The Fig.3 demonstrates the system design that gives adaptability to customers to make ordering food things in restaurant.

This system encourages customer to order from their dining table and informed back, when their order is ready, consequently sparing their holding up time on the restaurant tables.



Fig. 3. System Architecture of Communication

Microcontroller is the heart of the project. Here we developed android software which controls the operation of this microcontroller [14]. The wireless communication [15] between ordering and dispatching section is controlled by using Bluetooth. In the ordering section the microcontroller is controlled by a power supply, and an oscillator. A touch screen is an electronic visual display that can distinguish the Presence and area of a touch inside the display territory. The Term by and large alludes to touching the display of the gadget with a Finger. A touch screen [16] is placed on the table of the restaurant, when the user selects the food items from the touch screen as per his wish. After that by pressing the pay order key the corresponding food item bill will obtain at the kitchen by using a thermal printer a thermal printer helps for transfer the impression to the paper. Which connects the microcontroller wirelessly by Bluetooth and also bill which indicates the corresponding table number. Here use micro switches in the kitchen which provides the indication in corresponding tables by glowing the LED, which shows the food is ready in the kitchen. Then waiter can supply the food item to the correct table at the correct time.

IV. IMPLEMENTATION OF ANDROID BASED RESTAURANT AUTOMATION SYSTEM WITH TOUCH SCREEN

Here microcontroller used is microchips PIC 16F877A [17], [18]. Microcontroller scans the screen for any key press and decodes the key pressed. According to the key pressed it stores the data. The information is stored in the internal EEPROM of the microcontroller. Power supply section the 12V AC input is regulated to 5V DC. The 12V supply given to the bridge rectifier. It rectifies the ac input signal and converts the AC to DC. After rectification the supply will be 10.6V and this is

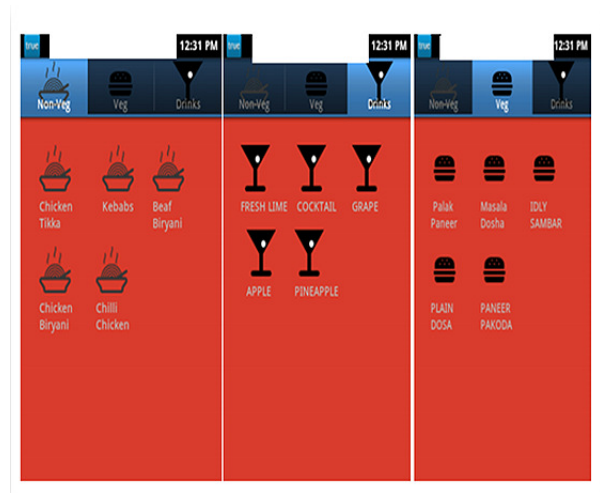


Fig. 4. Touch Screen Menu at Customer Side

given to capacitor for filtering of ac component, which avoid remove the ac component and make it a pure DC. The voltage is regulated by using voltage regulator 7805 [19]. The power supply output obtained as 5V.



Fig. 5. Display After Placing the Order

In this system for communication we are using asynchronous mode 8 bit. Bode rate is equal to 9600. We are using a crystal oscillator which is controlled by two capacitors. Proper tuning of the oscillator gives the proper communication. The touch input from the touch screen given to the controller to the 25th and 26th pin through a Bluetooth module. Both the Bluetooth module and controller works on the TTL logic. Max 232 [20] is used for synchronization between the controller and the thermal printer. We are using a reset pin for reset. The switch sw1 is connected to the reset pin of the controller. When the switch sw1 is closed the 1st pin in microcontroller is 0 and so it is reset. When switch is in off condition, the reset pin has a value 1. When it is 1 its voltage become -3V to -15V and if the reset pin has a value

0 its voltage become +3V to +15V.

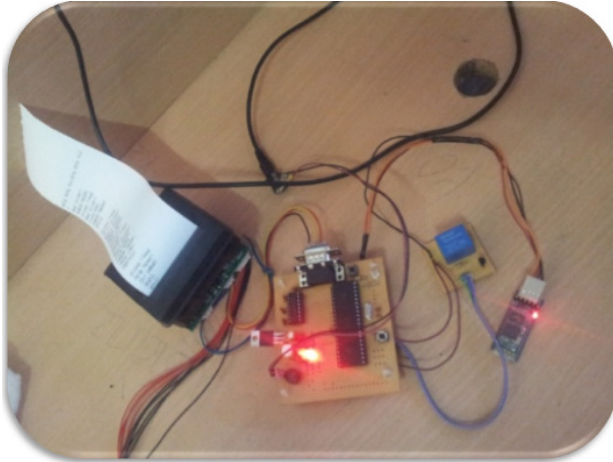


Fig. 6. Hardware of Proposed System

In this system we are automating the ordering process is done clearly ordering is done through the touch screen and it is stored in its internal memory. It then transmits to the kitchen through the Bluetooth; there it will receive the order and print the bill through the thermal printer.

V. RESULTS AND DISCUSSION

The graph shown in Fig. 7 shows comparison of processing speed Vs Delivery of the correct item while using touch screen and manual ordering. In manual system the processing speed is very less but in our system as the processing speed increases the delivery of the desired food item becomes possible.

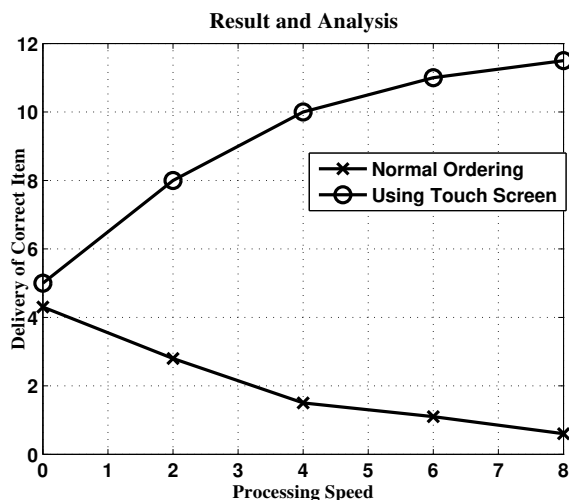


Fig. 7. Processing speed Vs Delivery of the Correct Item

VI. CASE STUDY

In order to check whether the system "An Android Based Restaurant Automation System Using Touch Screen" is feasible or not, we placed it in one of the famous restaurants of our area named 'Ruchi'. And we came to know that the restaurant

can work more efficiently with the help of our system. To our excitement, the system performance lessened the work efforts of the employees there and it reduced the time consumed as compared to the manual system. It automated most of the tough jobs such as asking for the order and waiting for the ordered item. Because it can instantly check whether the food item is available. Both the employees and customers are very much satisfied with the system.

VII. CONCLUSION

The Android-based food ordering system helps people to select food items from the touch screen placed in the table and to see the cost of items. By using a thermal printer to take bills, which are given to the kitchen. The hotel staff can read the items from the bill. If the food is ready in the kitchen, it can be indicated to the corresponding customer table. The ordered food can be supplied by the waiter. The main advantage of this project is that it can reduce the number of working staff and handwritten menus by the waiter can be replaced by a touch screen. The time delay in the delivery process can be reduced by automating the delivery system.

REFERENCES

- [1] J. Mustafa, R. Kothari, R. Naik, and A. Slatwala, "Touch & dine a multi-touchable restaurant system," *UACEE International Journal of Computer Science and its Applications*, vol. 2, no. 1, 2010.
- [2] P. R. Bora and E. Gupta, "Application on order management system in restaurants," *International Journal of Application or Innovation in Engineering & Management (IJAEM)*, vol. 1, no. 2, pp. p59–p62, 2012.
- [3] S. S. Tanpure, P. R. Shidankar, and M. M. Joshi, "Automated food ordering system with real-time customer feedback," *International Journal of Advanced Research in Computer Science and Software Engineering*, vol. 3, no. 2, 2013.
- [4] "Touch screen order system review," <http://e-square.com.au/review.html>, Jan. 2013.
- [5] N. A. Samsudin, S. K. A. Khalid, M. F. A. M. Kohar, Z. Senin, and M. N. Ikhkan, "A customizable wireless food ordering system with real-time customer feedback," in *2011 IEEE Symposium on Wireless Technology and Applications (ISWTA)*. IEEE, 2011, pp. 186–191.
- [6] T. Kashima, S. Matsumoto, and H. Ishii, "Recommendation method with rough sets in restaurant point of sales system," in *Proceedings of the International MultiConference of Engineers and Computer Scientists*, vol. 3, 2010.
- [7] M. R. Rahil, R. Mahind, S. Chavan, and T. Dhar, "Gled-touchpad based restaurant ordering & automatic serving system," *International Journal of Recent Technology and Engineering (IJRTE)*, vol. 2, pp. 168–172, 2013.
- [8] S. N. Cheong, W. W. Chiew, and W. J. Yap, "Design and development of multi-touchable e-restaurant management system," in *Science and Social Research (CSSR), 2010 International Conference on*. IEEE, 2010, pp. 680–685.
- [9] R. Shinde, P. Thakare, N. Dhomne, and S. Sarkar, "Design and implementation of digital dining in restaurants using android," *International Journal of Advance Research in Computer Science and Management Studies*, vol. 2, no. 1, 2014.
- [10] *SELF ORDER SPOT ON INTERACTIVE IN-BUILT CONSOLE*, 2014.
- [11] R. Bellamy, C. Swart, W. A. Kellogg, J. Richards, and J. Brezin, "Designing an e-grocery application for a palm computer: Usability and interface issues," *IEEE Personal Communications*, vol. 8, no. 4, pp. 60–64, 2001.
- [12] K. J. Patel, U. Patel, and A. Obersnel, "Pda-based wireless food ordering system for hospitality industry: a case study of box hill institute," in *Wireless Telecommunications Symposium, 2007. WTS 2007*. IEEE, 2007, pp. 1–8.

- [13] X. Hongzhen, T. Bin, and S. Wenlin, "Wireless food ordering system based on web services," in *Intelligent Computation Technology and Automation, 2009. ICICTA'09. Second International Conference on*, vol. 4. IEEE, 2009, pp. 475–478.
- [14] A. Al-Dhaher, "Integrating hardware and software for the development of microcontroller-based systems," *Microprocessors and Microsystems*, vol. 25, no. 7, pp. 317–328, 2001.
- [15] H. Erdem, "Implementation of software-based sensor linearization algorithms on low-cost microcontrollers," *ISA transactions*, vol. 49, no. 4, pp. 552–558, 2010.
- [16] G. T. Bender, "Touch screen performance as a function of the duration of auditory feedback and target size," Ph.D. dissertation, Wichita State University, College of Liberal Arts and Sciences., 1999.
- [17] P. M. I. Sets, "Pic16f877a enhanced flash microcontrollers datasheet," *Microchip Technology Inc*, 2003.
- [18] D. PIC16F87XA, "Pic16f877a," Retrieved September 13th, 2017.
- [19] *Electronic Devices and Circuit Theory*. Pearson Education, 2009.
- [20] J. Axelson, *Serial Port Complete: Programming and Circuits for RS-232 and RS-485 Links and Networks*. Lakeview Research, 1998.