Smart Restaurant Management System

Deepali Gayke[1]
Department of Computer Engg.,
K.K.Wagh Institute of Engineering Education and Research
Nashik, India

Tejashri Gorhe[2]
Department of Computer Engg,
K.K.Wagh Institute of Engineering Education and Research
Nashik, India

Amnit Kaur[3]
Department of Computer Engg,
K.K.Wagh Institute of Engineering Education and Research
Nashik, India

Diksha Kore[4]
Department of Computer Engg,
K.K.Wagh Institute of Engineering Education and Research
Nashik, India

Abstract: *In today's world of technology, so many efforts have been taken by restaurants owners to adopt information and communication technologies such as PDA, wireless LAN, costly multi-touch screens etc. to enhance dining experience. This paper highlights some of the limitations of the conventional paper based and PDA-based food ordering system and proposed the low cost touch screen based Restaurant Management System using an Android Smartphone or tablet as a solution. The system consists of a Smartphone/Tablet at the customer table contains the android application with all the menu details. The customer tablet, kitchen display connects directly with each other through Wi-Fi. Orders made by the customers will be instantly reach the kitchen module. This wireless application is user-friendly, improves efficiency and accuracy for restaurants by saving time, reduces human errors and provides customer feedback. 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.*

Keywords : Smartphone; Automated; Wi-Fi; E-menu; Android application; Intelligent; Ordering.

I. INTRODUCTION

To design and develop low cost touch screen based smart restaurant management system with the help of Android phone application to provide a user-friendly environment. Conventional method that usually been used in restaurant is by taking the customer's orders and write it down on a piece of paper. Many ordering system have been proposed in order to undertake this issue. The project is proposed with the wifi technology as the communication medium and screen display system with android application as the hardware which implements faster ordering system. It consists of a keypad at customer's table as a remote control and monitor at kitchen or counter to display the ordering information systematically. The aim for this project is to build and design both hardware and software for the ordering and delivering system at restaurants by using keypad, display screen via wifi communication. The project also targeted to receive information that works around 100m away with the specific location. Result shows that the hardware and software are successfully functional and able to be used as a smart ordering system. The project was able to solve the lack number of the worker, reduce the lateness and the error on ordering foods by the customers. For the future target, using touch screen display and compress the device to more compact device are recommended as the nowadays demand to interact young generation for using this system.

II. LITERATURE SURVEY

The journey for getting up to the peak of joy and facilities that we are presently experiencing started with initial footstep of a wireless technology. The introduction of basic proposed systems and consequent developments are been mentioned here Khairunnisa K. proposed

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the application of wireless food ordering system. This work presented in-depth on the technical operation of PDA[1] based Wireless Ordering System (WOS) adding systems architecture, function, limitations and recommendations.

N. M. Z. Hashim presented an approach to develop a system by introducing the integration of Bluetooth technology[2] as the communication medium and Peripheral Interface Controller (PIC) as the hardware which implemented faster ordering system.

S. R. Patil, Snehal Salunkhe highlighted the limitations of the existing technologies and proposed the advanced system, which focuses on low cost touch-screen[3] development to enhance the dining experience.

K. A. Wadile developed a control system for autonomous mobile robots[4] used in Hotel management. Mobile robot having minimal centralized control was developed. The work focused on the development of two basic motion control algorithms, namely a GOTO algorithm and a FOLLOW algorithm, for use in a master–slave system. These robot motion control algorithms would have wide applicability in hotel operations.

Ashwini Bankar, Mamta Mahajan later on took one step ahead. They further exended the service with Paypal[5]. Technologies were used innovatively in a modern restaurant such as multi-touch LCD with Arduino mega, RF module, database & line following Robot to enhance quality of services and to enrich customers' dining experience.

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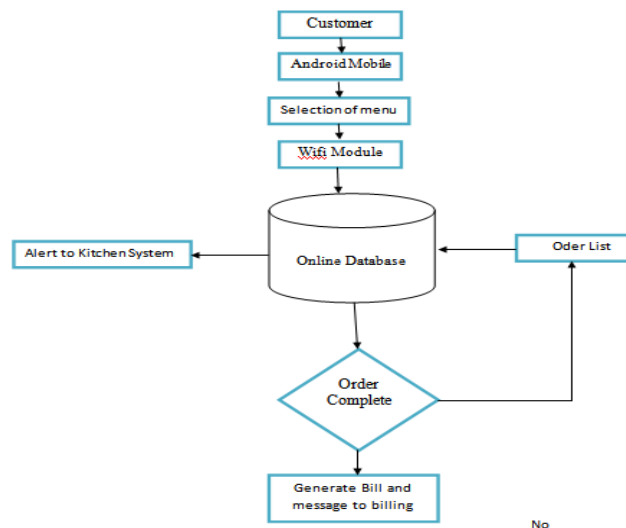
III. PRAPOSED SYSTEM

Fig 1: Block Diagram

Each table in the restaurant will be accompanied with an android tablet or a Smartphone. The device will be loaded with an android supporting application containing food menu details at that restaurant.   All the above mentioned digital components such as Smartphone/tablet (containing menu app), an another android phone (we used it for enabling hot-spot to tether the wireless network) and Wi-Fi module are connected wirelessly to create a Wi-Fi network.   Some steps are mentioned here to understand the working of the system easily:

- **Flowchart for understanding the system operation.**
    - Login: Credential details of the customer will be given to the system
    - Selection of menu: Menu will be selected from the order list
    - Wi_ module: Data transmission will be done by wi_ module
    - SOAP protocol: Simple Object Access Protocol is a messaging protocol that allows programs that run on disparate operating systems.
    - Generate bill: Automated paperless bill of given order will be generated

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Fig 2: Flow Chart of System

IV. ALGORITHMIC STUDY

A. Mathematical Model:

Let S be the system such that:

S = f I, O, Fg where,

1. I (input-n): Customer order and billing rates

2. O (output): Automated paperless system

3. F (set of functions): F1, F2, F3 where,

(a) F1 : SOAP protocol().

(b) F2 : Data transmission().

(c) F3 : bill generation().

B. Functional Dependency Matrix:

Table 1.1: Functional dependency matrix

	F1	F2	F3
F1	0	1	0
F2	0	0	1
F3	0	0	0

To develop a system by introducing the integration of Wifi technology as the communication medium and screen display (tablets) as the hardware which implemented faster ordering system. integration of touch technology in restaurants using android. This sys- tem was a basic dynamic database utility system which fetches all information from a centralized database. The tablet at the customer table contains the android application with all the restaurant and menu details. An android application was designed containing food item details in restaurant. The input device was Smartphone or tablet and output section was PC. Cloud-based server for storing the database was used which made it inexpensive & secure.
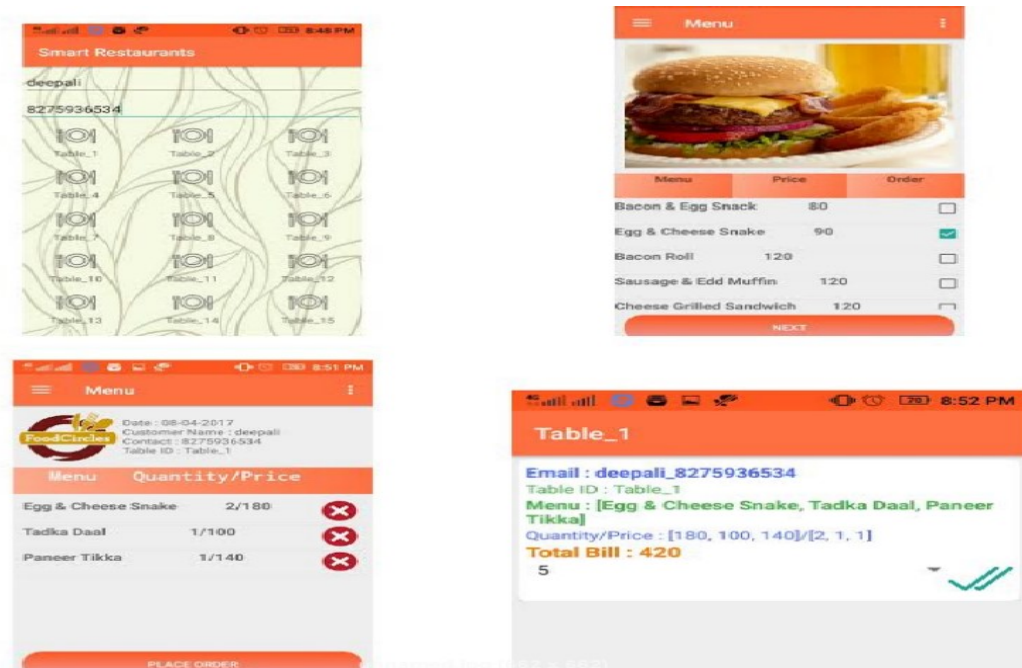
V.   Test Result

Fig 2: System Results

CONCLUSION AND FUTURE WORK

Smart restaurant is developed in order to provide easy interaction between customers through wireless technology with the help of android application. This wireless application is user-friendly, improves efficiency and accuracy for restaurants by saving time, reduces human errors. There is no need of a person to take the order from the table. The menu will be displayed automatically on the customer mobile application using wireless Wi-Fi connectivity and we can directly order the menu with the help of press on the menu..

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