



HUMAN ASSISTED RESTAURANT MANAGEMENT SYSTEM

Prof. Pranita P. Deshmukh
Computer Science and
Engineering
Prof. Ram Meghe Institute of
Technology and Research
Amravati, India

Anjali A. Jaiswal
Computer Science and
Engineering
Prof. Ram Meghe Institute
of Technology and Research

Aishwarya S. Kapse
Computer Science and
Engineering
Prof. Ram Meghe Institute of
Technology and Research
Amravati, India

Kalyani W. Gawande
Computer Science and
Engineering
Prof. Ram Meghe Institute of
Technology and Research
Amravati, India

Saurabh N Deshpande
Computer Science and
Engineering
Prof. Ram Meghe Institute of
Technology and Research
Amravati, India

Abstract: Human Assisted Restaurant Management System (HARMS) is a web application and an android version to restaurant management. It will have all the features of the rapid involving science and its different attributes. Through a strategic design and customer orientation, HARMS is integrated and has been created to optimize the work force and streamline restaurant work flow. It will run on an android, and is both scalable and modular to meet the needs of any establishment. HARMS is an effort to bring technology into the dining menu of customers. HARMS offer robust features that not only help your restaurant to update the menu any time but also improve the overall dining experience. The digital menu is to provide a user-friendly interface by offering smooth navigation and browsing through digital menu thus providing a delightful experience. The customers can order the food, through that android interface. My aims to not only improve the business of restaurants but also to incorporate the essence of science in dining menu. So future-ready restaurant management system is designed to keep track of everything that goes inside the restaurant, and everything is permission based to avoid theft.

Index Terms – HARMS, Restaurant Management System, android, digital.

I. INTRODUCTION

Traditionally visiting a restaurant involves selecting a meal from a paper based menu and being waited on by the restaurant's waiter staffs. An inattentive staff or busy restaurant can leave customers waiting to have their orders taken, to refill their drinks or to receive their bill for a long time. If the restaurant is busy the customer is left there, where he/she occupy table longer than they need. Any unnecessary waiting can reduce customer satisfaction reliability and ultimately result in lost business. To reduce customer wait, prior time management must be ensured. Sufficient staffs should be present during peak hours and that they are properly trained to provide proper customer service. Paper based menus are problematic. The restaurant may have a large amount of menu items which can make the menu appear overwhelming to go through it. As a result, the interested items are not fully seen by the customers. When changes to the menu are required, such as price adjustments or quantity change or item updates, the costs and environmental concerns associated with reprinting and all need to be considered. Menu changes are often left to accumulate until enough are required to justify the cost of reprinting. Changes may be required frequently and a paper menu would quickly become outdate. Waiting until the reprint is done before implementing the changes in the restaurant may not be a sound business practice. Manually updating of the menus instead of reprinting can cause to inconsistencies and this can give a bad impression to the customers. This may appear the restaurant cheap and low quality. The project is designed and is building a restaurant

management system that provides an interactive android based menu which replaces the paper menu entirely and removes much of the need to be waited on by the restaurant's waiter staff. This android based menu app also provides additional features designed to enhance the customer's overall experience. In the management side, it allows the restaurant's management to quickly make changes to the menu and provide a larger view of the restaurant at any given time. The restaurant menu and management system consists of the menu app, the management app, the web based site, the server and the database.

II. MOTIVATION AND TECHNICAL RELEVANCE

2.1 Motivation:

The mobile market is growing every year replacing the demand for traditional desktop applications. This makes software development for mobile devices an attractive and interesting industry to work in. The primary motivation for this project stems from the desire to learn and gain experience in android apps and web sites development as well as an interest in the design and development of distributed systems. The paper based menu system is very tiresome and needs a lot of wait by the customers to get noticeable by a waiter in a busy restaurant. And hence such a system will surely be a blessing for both customer and restaurant owners, which motivated us to work on the project more.

2.2 Technical Relevance:

The convergence of wireless as well as mobile technologies can facilitate ubiquitous platform for implementing business applications such as food ordering system. Without any information and communication technology, food ordering procedures require waiters to note orders from customers, bring orders to the kitchen, write receipts, and deliver the ordered menu. Although such routines look simple, the conventional food ordering system may significantly increase the work load of waiters or even lead to human errors in note making when the number of customers increases during peak hours. Some preliminary efforts have been taken to integrate mobile technology in automating the tasks of conventional food ordering system. Essentially, the mobile device used in the existing food ordering systems was limited to personal digital assistants (PDAs). [1] While personal digital assistants are well-known for their portability features and capability to communicate with personal computers, there are some drawbacks to be addressed when they are used for food ordering tasks in restaurants. In short, the personal digital assistants -based systems do not support ubiquitous communication, are exposed to health hazard, has lower hardware and GPU (graphical processing unit) [2] capability and, are considerably more expensive for business to operate when a large quantity is needed.

III. RELATED WORK

The world has contracted with technology. Technology had affected the restaurants with greater impact. RFID technology, digital menus, service robots are some of the examples of advanced technology are coming to the future restaurants. However, the restaurant service process has to stay customer-centered and it will mainly include human service also in the future Customizable Wireless Food Ordering System with Real- Time Customer Feedback is discussing, the design and implementation of a customizable wireless food ordering system with the help of a real-time customer feedback for a restaurant (CWOS-RTF) [3]. The CWOS-RTF enables restaurant owners to set-up the system in the wireless environment and update menu presentations efficiently. Smart phone has been integrated in the CWOS-RTF. Instead of using PDA's to interface with customers, they leverage smart phones to provide necessary interfaces for customer to view and order menu. With private login system, customers are able to view and make order and receive updates in real-time and collect receipts right from the smart phone itself. It allows restaurant managers to manage orders from customers instantaneously whenever he or she logged in into the system. [4] Some early efforts have been made to utilize these technologies in food ordering system implementations. However, the food ordering systems that have been proposed earlier have certain limitations, initially in cost effectiveness, allowing privations and supporting real-time feedback from customer's implementation to facilitate real-time communication between restaurant owners and customers. [5]

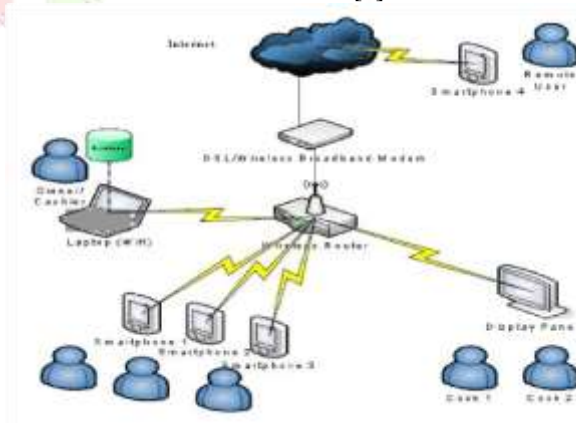


Figure 3.1: Architectural diagram of CWOS-RTF with internet access

The existence of wireless technology as well as the emergence of mobile devices enable the simple with powerful infrastructure for business application to restaurant management system.[6] Technology can be deployed effectively to manage all the day-to-day tasks in restaurants. By using a new software-oriented approach we can eliminate a number of counters leading to a savings in space as well as staff for a restaurant .[7]This new approach lead to the one-time investment as we do not have to pay salaries to a very large staff.

3.1 The CWOS-RTF is built on four main components:

- The mobile application on the android phones for customers to make order.
- The web based application and server on the laptop or on the computer systems for restaurant owner to keep track and respond to received customer's orders, and customize menu data.
- The database for restaurant manager to store order details and updated menu information.
- The wireless infrastructure to support networked communications. This system can be extended as running Customer Wireless Food Ordering System – Real Time Feedback on more restaurants and customers to report on their acceptance. In spite of the fact current interface (New Order List) can be used by the staff of the kitchen, the system can be further updated by adding inventory management module for the kitchen staff. Besides this, a module for remote delivery can be added for bigger customer area. Finally, the system can be enhanced to register and link multiple restaurants for more food varieties to the customers.

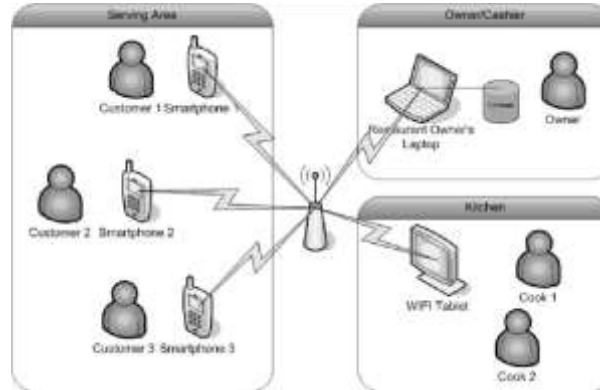


Figure 3.2: Architectural diagram of CWOS-RTF without internet access

Typically in a restaurant food order process involves several steps for ordering the food where firstly customer starting from browsing the paper based menu and informing the waiter for desire ordering items. [8] Usually the process requires that the customer has to be seated before it starts. For the customers there can be the alternative to described through Implementation Customizable Ordering Food Ordering System Using Web Based Application [9] “A Food Pre-Order System using Web Based Application “in which customer can be able to make the order before they reach the restaurant using android phone. When the customer approaches the restaurant, the saved order can be confirmed. The list of selected pre-ordered items shall be shown on the kitchen screen, and when confirmed, order slip shall be printed for further processing of the order. The solution provides easy and convenient way to select pre-order transaction form customers. [10]

3.2 The Objectives of the system:

- To merge Wireless technology and Android Operating System to automate food ordering process.
- To reduce the imperfection in conventional system by minimizing the working of a restaurant.
- To make provisions for obtaining feedback from the customers and provide the restaurant a means of review of the service.
- To utilize wireless communication and android phone technology in implementing the automated food ordering system.
- To make more user interfaces efficient and customization for the restaurant owner to update the menu content on the android devices.

3.3 Conceptually the system is built using following components:

- The android application is used to make orders from android.
- The restaurant-owners laptop/android will keep track of customer records and also customize menu using server application.
- The central database is used to store updated menu information and order details.
- The three main areas of restaurant have been connected via wireless technology.

3.4 The technologies which will be use to implement the system:

- Visual Studio 2010 for developing web application.
- Android version 2.2 or more for Androids is required.
- SQL 2008 is a light weight Database which is going to be used for database access from the android.



Figure 3.3: Architectural Diagram of Customizable Ordering Food Ordering System

3.5 Summary of system functionalities

3.5.1. Android on table

- There will be an android on each table.
- This will allow the customers to browse the food items as many times as they want.
- Customer can view the suggestions for a certain menu item generated by the system.
- Customer can enter their details during bill payment. This helps the Restaurant owner or manager to analyze the service and can update the customer regarding different offers through messages or emails.
- Suggestions for Customer.

3.5.2. Attractive Presentation

- The Menu can be organized in an attractive way.
- There are images for every food item which will make the view of customers more about how the food will look like after delivery.
- There is an attractive use of different themes and color schemes.

3.5.3. Modifiable Menu

- The Admin manager can modify the menu.
- Admin manager is able to add, update and delete menu items.

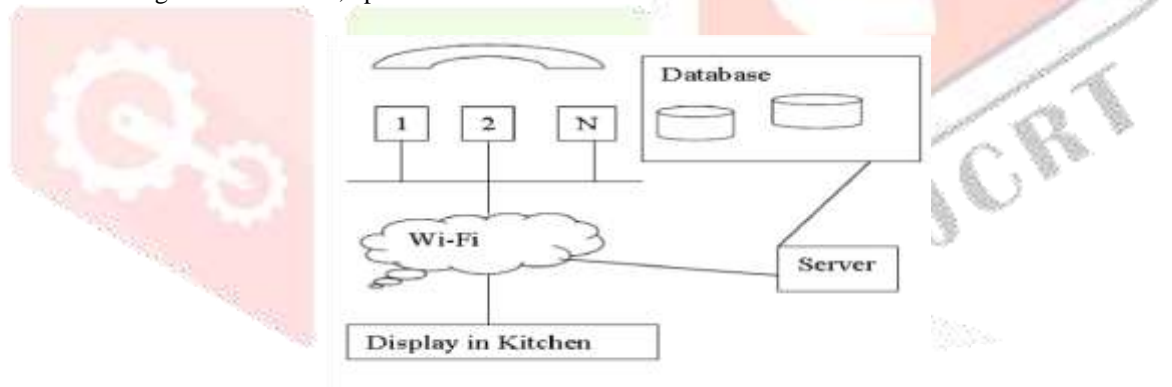


Figure 3.4: Architectural Diagram of Wireless Customizable Food Recommendation System

3.6 The different modules associated within are

3.6.1. User Registration Module: With the help of this module the user creates a simple account, in which order details, billing details is saved and is used for future recommendation.

3.6.2. User Ordering Module: This module handles ordering of the food, which will have an attractive interface, includes dish suggestion, high demand dish list, diet dish list, dish cancellation, etc. The ordered dish status is automatically added to a web server and sends to both kitchen module and Manager which is added to bill.

3.6.3. Kitchen Module: In this module, the chefs will get the order details from the food ordering module, where the current status of cooking is displayed; it will also display the current table of the customer and waiter severing to that table.

3.6.4. Manager Module: Manager Module will do a current updating of customer's food, billing, where he can connects the data to the server. The order cancellations of the customer is managed by manger module. This helps the chef to cook accordingly.

3.7 Advantages of propose system:

The following are the advantages of HARMS

- Software with real time customer management.
- It is a replacement of both waiter and paper based menu.
- Customers feel free to express their opinion about food.
- Restaurant owners will be able to get a chance to improve through the feedback of customers.
- Time saving process is that the chef and all the other staffs works in fixed time limit.
- Up-to-date information about the ordered dish can be made available to customer.

- Dish cancellation can be done with in a specifics time.
- Diet based life style can be followed with such a system.
- Restaurants become friendlier to customer.

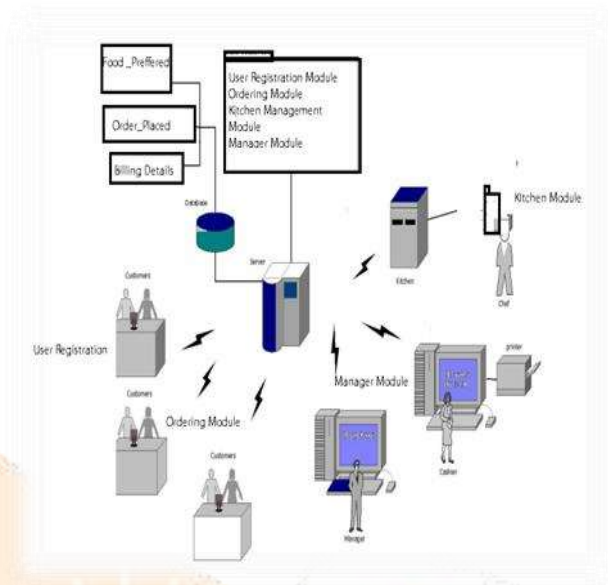


Figure 3.5: Architectural Diagram of HARMS

The figure shows the architectural diagram of HARMS. It shows how each module is connected with each other. Each module is connected to a database where every data is saved and secured. The central server controls the overall working of the system. The details about the food ordering, food comments etc. are stored in the database.[11] The user register themselves in the user registration module with their name ,contact details food diet details etc. and order their food . The ordering is a part of ordering module where the application compares the previous history and food recommended according to user's profile. Then the next step is to prepare the food according to customers wish. After this the entered data is send to the chef via a central server and he prepares the food. All the details about dishes is visible to the customer. The customer may cancel some dishes in this case the details of cancellation are updated in the server, further send to the cook. [12] At last these details are send to the manager section to bill the expense and a hard copy is delivered to the customer at the same time soft copy is provided via an android application .This comes under the manager module. The manager module is the administration module who will have all the authorities and manages the other modules.

IV. SYSTEM REQUIREMENTS

Here we are including the software and hardware used for developing the project and implementing the project.

A. Software Requirements

1. Android SDK (Software Development Kit)
2. Android Studio
3. Expression Web 4.0
4. XAMP Server

B. Hardware Requirements

Android -Android

- Version : Minimum 2
- Storage : 2 GB
- CPU : 1 MB

PC with Windows OS

- Storage : 2 GB
- CPU : 1 MB
- Android SDK is used to create an android platform in the system. JDK is the Java Supporting package.

V. CONCLUSION

The urge for the digital restaurant management systems is increasing day by day. 'Human Assisted Restaurant Management System' named as HARMS is a perfect solution for this. With the help of this the ease of access and flexibility of the day to day works in the restaurant is made. The features such as dish recommendation make this software efficient. Both the management side and worker site can manage the data using such system. It will very attractive and reliable system which can be in corporate to the chain of hotels so can easily maintain and address. The focus in improving service quality is on one attractive quality item, and three must-be quality items related to food and beverage, physical attributes, and staff service attributes. Therefore, restaurant proprietors must assess operational results based on the execution of the degree of importance of projects from five aspects, while leading in diversity of restaurant service design, and must continue to improve service quality and hence competitiveness.

REFERENCES

- [1] C. Chen, and Y, Guan, "Experience design of the theme restaurant, make the dining be a memorable experience," in Proceedings of 9th International Conference on Computer-Aided Industrial Design and Conceptual Design, Shanghai, China, pp. 982–985, November 2008.
- [2] Sakari Pieskä, Markus Liuska, Juhana Jauhiainen, and Antti Auno of Centria University of Applied Sciences Ylivieska; "Intelligent Restaurant System Smart Menu That Digital Technology"; coginocom 2013 4th IEEE International Conference on Cognitive Info communications December 2–5, 2013, Budapest, Hungary.
- [3] Noor Azah Samsudin, Shamsul Kamal Ahmad Khalid, Mohd Fikry Akmal Mohd Kohar, Zulkifli Senin, Mohd Nor Ihkasan; "A Customizable Wireless Food Ordering System With Real-Time Customer Feedback."; 2011 IEEE Symposium on Wireless Technology and Applications (ISWTA), September 25-28, 2011, Langkawi, Malaysia.
- [4] Nilam Kadale, Pranjali Bansod, Reshma Pillai, Shivangi Sane, Snehal Pratape, Swati Pawar ; " Wireless Customizable Food Recommendation System Using Apriori And K-Means Algorithm ."; IJLTEMAS , Volume IV, Issue X, October 2015.
- [5] Varsha Chavan, Priya Jadhav, Snehal Korade and Priyanka Teli of Computer Department, Pune University Indapur, Maharashtra, India; "Implementing Customizable Online Food Ordering System Using Web Based Application"; IJISSET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 4, April 2015.
- [6] K. J. Patel, et al., "Pda-Based Wireless Food Ordering System For Hospitality Industry - A Case Study Of Box Hill Institute," in Wireless Telecommunications Symposium 2007, Pomona, CA, 2007, pp. 1-8.
- [7] Jiawei Han and Micheline Kamber, "Data Mining: Concept And Techniques", University of Illinois.
- [8] M. Z. H. Noor, A. A. A. Rahman, M. F. Saaid, M. S. A. M. Ali, M. Zolkapli —The Development of Self-service Restaurant Ordering System (SROS) | 2012 IEEE Control and System Graduate Research Colloquium (ICSGRC 2012)
- [9] C. Chen, and Y, Guan, "Experience design of the theme restaurant, make the dining be a memorable experience," in Proceedings of 9th International Conference on Computer-Aided Industrial Design and Conceptual Design, Shanghai, China, pp. 982–985, November 2008.
- [10] Jang, Dongsuk and Mattila, Anna S. "An Examination of Restaurant Loyalty Programs: What Kinds of Rewards Do Customers Prefer?" International Journal of Contemporary Hospitality Management Vol. 17 Iss: 5, 2005, pp.402-408.
- [11] Keitz, Von B. "Eyemovement Research: Do Consumers Use Information They Are Offered?" European Research Vol. 16 No.4, Nov. 1988, pp.217-23.
- [12] Jang, Dongsuk and Mattila, Anna S. "An Examination of Restaurant Loyalty Programs: What Kinds of Rewards Do Customers Prefer?" International Journal of Contemporary.

