

Contactless Dining Based Restaurant Management Application

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Abstract - This project aims at automating the entire restaurant management process for multiple restaurants based on individual login and implementing contactless dining experience to the customers. The Graphical User Interface enables restaurant owners and staff members to view the real time data of the orders ,sales and manage them. The overall Application has various features to manage operations including various departments and also provides separate logins for each department. Various reports on day basis and monthly basis are generated and have the feature to be downloaded also. Customers can have their own login to order food and track the status of their order in real time thereby implementing contactless dining norms. This project thereby reduces man power and also provides real time data and has efficient collection of past data.

1. INTRODUCTION

Restaurant plays a major role in the food and beverages industry which is actually a major part of daily life of people. This project aims at automating the entire restaurant management process for multiple restaurants based on individual login and implementing contactless dining experience to the customers. The Graphical User Interface enables restaurant owners and staff members to view the real time data of the orders ,sales and manage them. The overall Application has various features to manage operations including various departments and also provides separate logins for each department. Various reports on day basis and monthly basis are generated and has the feature to be downloaded also. Customers can have their own login to order food and track the status of their order in real time thereby implementing contactless dining norms. This project thereby reduces man power and also provides real time data and has efficient collection of past data. This paper is organized as follows. In Section 2, we briefly introduce several modules present in our application and their features. In Section 3, we describe each module in detail and its use cases and activity are clearly depicted which makes the application more understandable. In Section 4, we test it using various test cases and verify its performance with various testing strategies. The final section concludes the paper and points out the future work.

2. MOTIVATION

The motivation of the project is, nowadays different types

of management systems are available, at the same time they are not following contactless dining norms which is the recent need. Food industry is spread worldwide and restaurants are our focus. One of the main challenges in this area is safety which is fulfilled by contactless practices. Unless we follow contactless dining practices it is considered totally unsafe and unhealthy. Keeping in mind the covid situation, the aim of having in-contact dining practice is a fear and threat to the current situation in the society. Our project takes measures to provide healthier and safe digital restaurant practices to the upcoming days of a better world. One of the solutions to deal with the problem is to build a High-performance automated operation tool that consists of a Visually understandable user interface that enables users to get used to contactless dining practices. The idea is to combine all the modules required for management of the restaurant under one roof in a highly efficient digital platform with a Visually understandable user interface and application which captures accurate data and provides Efficient reports on that data.

3. PROBLEM DEFINITION

The problem statement of the project is that the management tool for any restaurant is mostly semi-automatic with manual intervention in many tasks. Most modules in restaurants aren't automated yet. Contactless dining practices aren't followed as they are not in practice while in the past but now it is a necessary part of dining culture. This project aims to overcome the above with recent stable technologies in an efficient way possible.

4. PROPOSED SYSTEM

In the proposed system the entire restaurant management process is automated. Multiple restaurants have their own individual login. Also, contactless dining norms are followed by reducing human intervention to a great extent from the customers. The Graphical User Interface enables restaurant owners and staff members to view the real time data of the orders ,sales and manage them. Each department had separate logins for them. various departments in restaurants are covered (departments : kitchen , manager, cashier , waiter) .Generates Daily and monthly Reports .Provides real time data and has efficient collection of past data.

5. FEASIBILITY STUDY

A feasibility study is carried out to select the best system that meets performance requirements. The main aim of the feasibility study activity is to determine that it would be financially and technically feasible to develop the product.

5.1 Technical Feasibility

This is concerned with specifying the software will successfully satisfy the user requirement. Open source and business-friendly and it is truly cross platform, easily deployed and highly extensible.

5.2 Economic Feasibility

Economic analysis is the most frequently used technique for evaluating the effectiveness of a proposed system. The enhancement of the existing system doesn't incur any kind of drastic increase in the expenses. PHP is open source and ready available for all users. Since the project is runned in web enhancement and updation is easy hence is cost efficient.

5. SYSTEM REQUIREMENTS

6.1 Software Requirements

The software requirements are the specification of the system. It should include both a definition and a specification of requirements. It is a set of what the system should do rather than how it should do it. The software requirements provide a basis for creating the software requirements specification. It is useful in estimating cost, planning team activities, performing tasks and tracking the team's and tracking the team's progress throughout the development activity.

Operating system : Windows

Coding Language : PHP, JavaScript, AJAX, jQuery

Front End Tool : HTML, Bootstrap4, JS

Database : MySQL

Server : Apache

Tool : xampp

Development

environment : Visual studio code

6.2 Hardware Requirements

The hardware requirements may serve as the basis for a contract for the implementation of the system and should therefore be a complete and consistent specification of the whole system. They are used by software engineers as the starting point for the system design. It shows what the systems do and not how it should be implemented.

7. SYSTEM DESIGN

Systems design is the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development. There is some overlap with the disciplines of systems analysis, systems architecture and systems engineering.

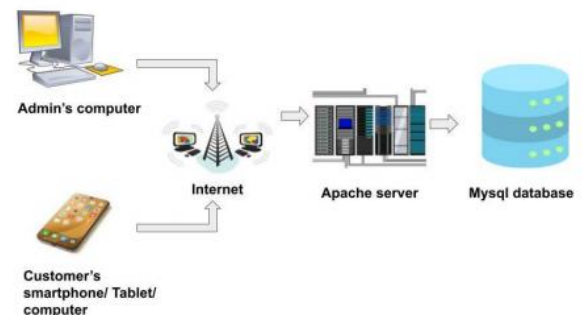


Fig -1: Architecture diagram

7.1 Modules Description

Admin Module

1. Administration module
2. Menu management
3. Employees module
4. Additional settings module
5. Reports module
6. Table and order management module

Customer Module

1. Menu module
2. Cart module
3. Bill module
4. Track order status module
5. Digital menu

7.2 Modules Definition

Administration module

Consists of dashboard to view the overall data such as sales , products available, orders, pending orders, total sales etc.

Menu management

Contains all the features to add delete or edit an item in the digital menu and also provide availability status of the item

Employees module

Features such as add employee provide separate login , page role mapping and others

Additional settings module

Consists features to reset pin , password etc.

Reports module

Generates and displays reports based on selection criteria

such as monthly report, daily report etc

Table and order management module

Has features to create table, change table availability status, create order order status and tracking and edit features

Menu module

This module enables customer to view menu and make selections to add in the cart

Cart module

This consists of a list of items based on customer selection in order to provide a over all view of the total selection to proceed to the next process

Bill module

Here comes the final step which enables customer to pay for the food

Track order status module

After making the order this module has features to track the status of the order such as pending , in progress and delivered.

Digital menu

This is the digital food menu provided by the particular restaurant which is made available for the customer to make selection and process further with the selection

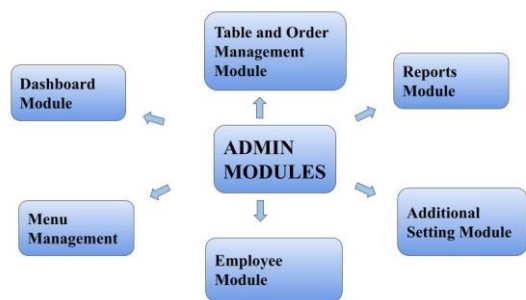


Fig -2: Admin Module Classification

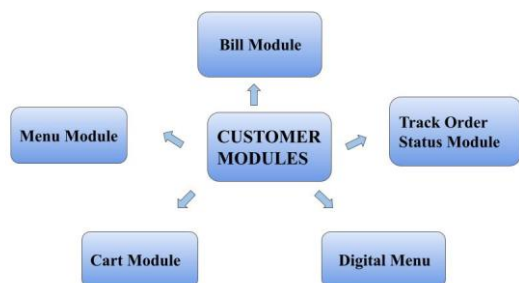


Fig -3: Customer Module Classification

7.3 Data Processing

Collecting the data is one task and making that data useful is an-other vital task. Data collected from various means

will be in an unorganized format and there may be a lot of null values, in-valid data values and unwanted data. Cleaning all these data and replacing them with appropriate or approximate data and removing null and missing data and replacing them with some fixed alternate values are the basic steps in preprocessing of data. Even data collected may contain completely garbage values. It may not be in the exact format or way that is meant to be. All such cases must be verified and replaced with alternate values to make data meaningful and useful for further processing. Data must be kept in an organised format. This is taken care and data fetching is done in such a way that eliminates the ills.

8. TESTING

Generally testing process is carried out to ensure that the system has been developed according to the required specifications and the expected output is properly obtained. There are two main categories of testing namely, the White Box Testing and the Black Box Testing. Each of this testing in turn consists of many types of testing.

Table -1: Test Case Table

S.NO	Function	Description	Expected output	Actual output	Status
1.	Register	Register use details	Account registration in application	Registration accepted	success
2.	Login/ Logout	Login using registered data	login into application	login details accepted	success
3.	Make order	Making an order from menu	To place order	Order placed	success
4.	Track order	view status of the order	show status	status is viewed	success
5.	Data fetching	Data in each table is fully fetched	Do fetch all data correctly	Data fetched	success
6.	Menu Management	Menu in the restaurant	Show digital menu	Digital menu shown	success
7.	Report Table	All the collected data are organised into report	Generate report	Report generated	success

9. CONCLUSION

Nowadays different types of management systems are available, at the same time they are not following contactless dining norms which is the recent need. Food industry is spread worldwide and restaurants are our focus. One of the main challenges in this area is safety which is fulfilled by contactless practices. Hereby we conclude that our project will provide a better futuristic solution for advanced management of restaurants considering current needs and efficient data processing and manipulation.

10. REFERENCES

[1] 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

[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"; coginfocom 2013 4th IEEE International Conference on Cognitive Infocommunications December 2-5, 2013 , Budapest, Hungary.

[3]Ching-suchang, Che-chen Kung, Tan-hsu Tan,"Development And Implementation Of An E-Restaurant For Customer-Centric Service Using Wlan And Rfid Technology",proceedings of the Seventh International Conference On Machine Learning And Cybernetics, Kunming, 12-15 July 2008

[4]Soon Nyeon Cheong, Wei Wing Chiew, And Wen Jiun Yap; "Design And Development Of Multi-Touchable E-Restaurant Management System "; 2010 International Conference On Science And Social Research (Csr 2010),December 5 - 7, 2010, Kuala Lumpur, Malaysia

[5]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

[6]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"; IJSET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 4, April 2015.

[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)

BIOGRAPHIES



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