Restaurant & Hotel Management System

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DECLARATION

Declare that the work presented in this graduation project thesis entitled [Restaurant & Hotel Management System] is my own original work and has not been submitted for any other degree or qualification.

All sources of information and materials used in the preparation of this thesis have been duly acknowledged and referenced. Any data, software, or other resources obtained from external sources have been appropriately cited and credited.

I affirm that I have adhered to the ethical principles and guidelines of academic integrity in the conduct of this research and in the preparation of this thesis. I have not engaged in any form of academic misconduct, including plagiarism, fabrication, or falsification of data.

I acknowledge that the intellectual property rights of any third-party material used in this thesis remain with the original owners, and I have obtained the necessary permissions and licenses for their use.

I understand that any breach of academic integrity may result in the revocation of my degree and other disciplinary actions as deemed appropriate by the University.

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ABSTRACT

Hotel & Restaurant Management System is a real time ordering system to manage the ordering process for restaurants. This website helps customers to order without having to wait for the waiters to serve them. The traditional way is taking the order using paper causing missing orders, or not correctly recording the customer's order. The traditional ordering system brings inconvenience to both staffs and customers; as it requires a lot of manual work. Nowadays, smartphones have been widely used in every aspect of our lives; so by having this ordering website, the time of ordering process has reduced.

Using this website, customers just capture QR Code in the restaurant or hotel room for viewing the home page.

Through it, they can view the menu and see the available dishes, have a look at offers & coupons, donate a meal to the poor, or make an order. To make an order, the user can filter available meals to find the most suitable for his desire. There's also a recommendation section based on best selling dishes.

The user can order and choose the time of serving. After placing an order, it will be send through to the kitchen and gives the customer an estimated time for preparation and serving. When the customer wants to leave he can close the table form his phone, and choose a payment method and pay his check. Then the user is asked to give his feedback about the food quality, service and the website.

This new ways of ordering will ultimately save time for the waiter to take up orders and this application improves the method of taking the order from customer. In addition, restaurant and hotel owners can add or manage their food menus and get notification the ordering food has been send to the customers.

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Introduction

1.Chapter 1

1.1 Overview

Restaurant management refers to managing day-to-day operations within a restaurant or similar setting. It encompasses various tasks and responsibilities, from overseeing company finances and facilitating business growth to overseeing marketing, managing the workforce, and delivering a great customer experience. Essentially, a restaurant manager's job is to balance the various needs of the business, provide leadership, set strategic objectives, use restaurant management software, and ensure all departments are functioning as they should. Ultimately, restaurant management is concerned with guiding a restaurant to long-term success.

A restaurant management system is a type of software that has been specifically designed for use within the restaurant industry. Also known as restaurant management software, such solutions are intended to assist leaders and others in carrying out the most critical managerial tasks. A system of this type may be a comprehensive all-in-one solution, including elements of a point-of-sale system, such as payment processing, with more complex back-end features, such as workforce management, inventory management, and a booking or reservations system. However, some restaurant management systems focus on specific areas.

Many of the benefits of using restaurant management systems are related to automation and speeding up processes to improve the customer experience. Modern customers expect fast, frictionless service, and restaurant management software plays a key role in meeting these expectations. Additionally, such solutions can serve as a critical piece of restaurant technology because they bring many different processes together in one location. A comprehensive restaurant management system will allow for payment processing, financial management, sales tracking, performance monitoring, personnel management .

Using this website, customers just capture QR Code in the restaurant or hotel room for viewing the home page. Through it, they can view the menu and see the available dishes, have a look at offers & coupons, donate a meal to the poor, or make an order. To make an order, the user can filter available meals to find the most suitable for his desire. There's also a recommendation section based on best selling dishes. The user can order and choose the time of serving. After placing an order, it will be send through to the kitchen and gives the customer an estimated time for preparation and serving. When the customer wants to leave he can close the table form his phone, and choose a payment method and pay his check. Then the user is asked to give his feedback about the food quality, service and the website. This new ways of ordering will ultimately save time for the waiter to take up orders and this application improves the method of

taking the order from customer. In addition, restaurant and hotel owners can add or manage their food menus and get notification the ordering food has been send to the customers.

As mentioned previously, the traditional way of ordering process requires a lot of manual work; causing some human errors; such as the probability of paper loss and the kitchen's staff can misinterpret the handwriting of order. All these human errors will cause dissatisfaction with the user experience. One of the problems faced by hotels using the traditional ordering system is the difficulties to update the new menu. If they want to change the menu, they have to reprint again. This will increase the cost and wastage of paper. Based on those problems, by implementing an electronic and efficient ordering service can avoid them. By using the proposed system, the restaurant productivity and customer satisfaction can be improved. Another benefit of using this proposed system is avoiding human contact as much as possible. Also, managers save the wages paid to waiters, or save their time for other tasks.

1.2 problem definition

problem statement restaurant management system, this system basically runs between customers and management in a restaurant. the customer interacts with generally one waiter and places their order, while the waiter takes multiple customers in a day. the customer places an order with the waiter, the waiter generates an invoice with the details of the customer, their order and table number, which is sent to the kitchen. once the order is prepared the runner uses the invoice to serve the food. the waiter usually asks again if the customers want to order anything more, this process can go on till the customer decides he does not want any more food. all the invoices generated by the customer are part of a much larger entity called order. the order is essentially the bill generated in the end by the restaurant for the customer. now we know the customer, waiter and invoice will be present in the order table. the relationship between customer and order is one to one. the relationship between the waiter and order is one to many. the relationship between invoice and order is one to many

A Hotel Reservation multiple view model is to be created for a Software Product Line, which can be tailored to the needs of an individual hotel chain or hotel. The system manages information about rooms, reservations, customers, and customer billing. The system provides functionality for making reservations, check in, and check out, in addition to generating reports and displays. In addition, several optional and variant capabilities are provided.

A customer may make reservations, change, or cancel reservations. When making a reservation through a reservation clerk, a customer gives personal details, states the room type, number of occupants, and dates of arrival and departure. A reservation is either guaranteed by credit card or not guaranteed. Reservations that are not guaranteed are automatically cancelled at a pre-specified

time, e.g., 6 PM. A no-show customer has to pay for a guaranteed reservation. A desk clerk can check in a customer (with or without a prior reservation), change the checkout date, and check out the customer. A specific room is assigned to the customer at check-in time and a customer record is created. A customer may pay by cash, check, or credit card. A customer billing record is created and the customer receives a check out statement. A customer who does not check out by the checkout time is charged for an additional night.

Optional capabilities of the Hotel Reservation System are:

a) Management reports. The manager may view the hotel occupancy figure for the present or past dates, view projected occupancy figures for future dates, and view financial information, including room revenue information.

b) Automatic cancellation for non-guaranteed reservations. At a pre-specified time, e.g., 6 PM, all rooms that are not guaranteed are cancelled and guaranteed reservations are marked as must-pay.

c) Automatic billing of no-show guaranteed reservations. At a pre-specified time, e.g., 7 AM, a report is generated of no-shows with guaranteed reservations. A billing record is created for each no-show reservation.At the same time, a report is also produced giving the total occupancy and revenue (computed from rooms allocated) for the previous night.

d) Block bookings. A travel company can book a block of rooms at a discounted rate for one or more nights. Bills are charged directly to the travel company.

e) Other optional functions include customer billing for restaurant charges, room service and laundry, various, telephone service, automatic issuing of keys, and a club facility.

f) Variant functionality includes the reservation of residential suites instead of hotel rooms, where a guest can occupy a suite for a week or month at a time, paying a weekly or monthly rate

1.3 Technology affected ordering food from a restaurant in hotel

Technology has revolutionized the way we order food from restaurants in hotels. In the past, customers had to rely on a physical menu and interact with a waiter or waitress to place their orders. However, with the advent of technology, ordering food has become more convenient, efficient, and personalized.

One of the most significant technological advancements in the food ordering process is the use of mobile applications. Many restaurants and hotels now have their own mobile applications that allow customers to place their orders directly from their smartphones or tablets. This has made ordering food more accessible, especially for customers who prefer not to interact with waitstaff or have limited time to dine.

Another way technology has affected ordering food from a restaurant in a hotel is through the use of self-serve kiosks. These kiosks allow customers to place their orders independently, without the need for a waiter or waitress. Self-serve kiosks have become increasingly popular in hotels as they help reduce wait times and boost overall efficiency.

Furthermore, technology has enabled restaurants in hotels to offer more personalized ordering experiences. For instance, some restaurants use customer data to create personalized menus and recommendations based on the customer's past orders or preferences. This level of personalization enhances the customer experience and helps build customer loyalty.

Finally, technology has also impacted the payment process in restaurants. Many hotels and restaurants now offer digital payment options, such as mobile payments, online payments, or contactless payment methods. This has made the payment process more convenient and secure for customers, while also reducing the risk of fraud.

In conclusion, technology has transformed the way we order food from restaurants in hotels. The integration of mobile applications, self-serve kiosks, personalized ordering experiences, and digital payment options has made the process more convenient, efficient, and secure. As technology continues to evolve, we can expect further improvements in the food ordering experience, leading to even more satisfied customers.

1.4 Project objective

1- Reduce the number of waiters needed; reducing the cost for restaurant owners, or giving them more time to do other tasks.

Figure 1.1 No More Waiters

2- Reduce human interaction; another advantage of not having waiters is reducing physical interaction as much as possible

Figure 1.2 Reduce Human Interaction

3- Reduce human errors during the ordering process; getting orders wrong, not getting the order/check on time, or kitchen staff misinterpreting the orders due to bad handwriting.
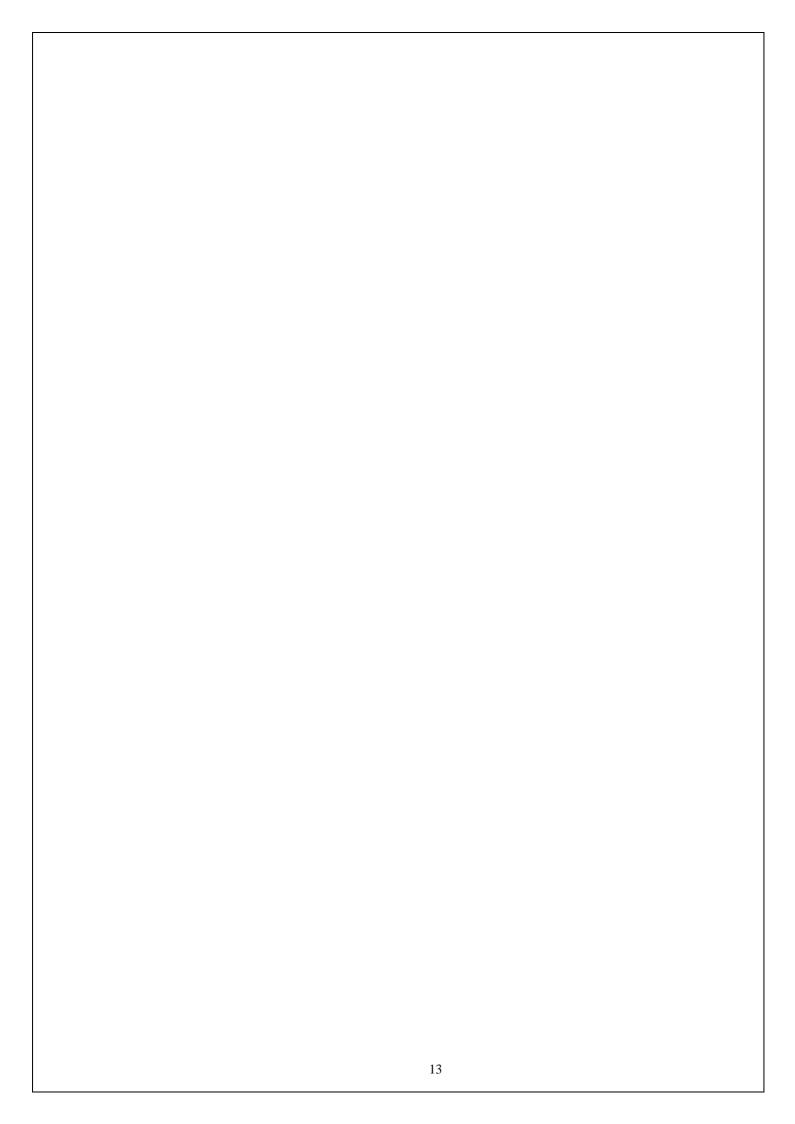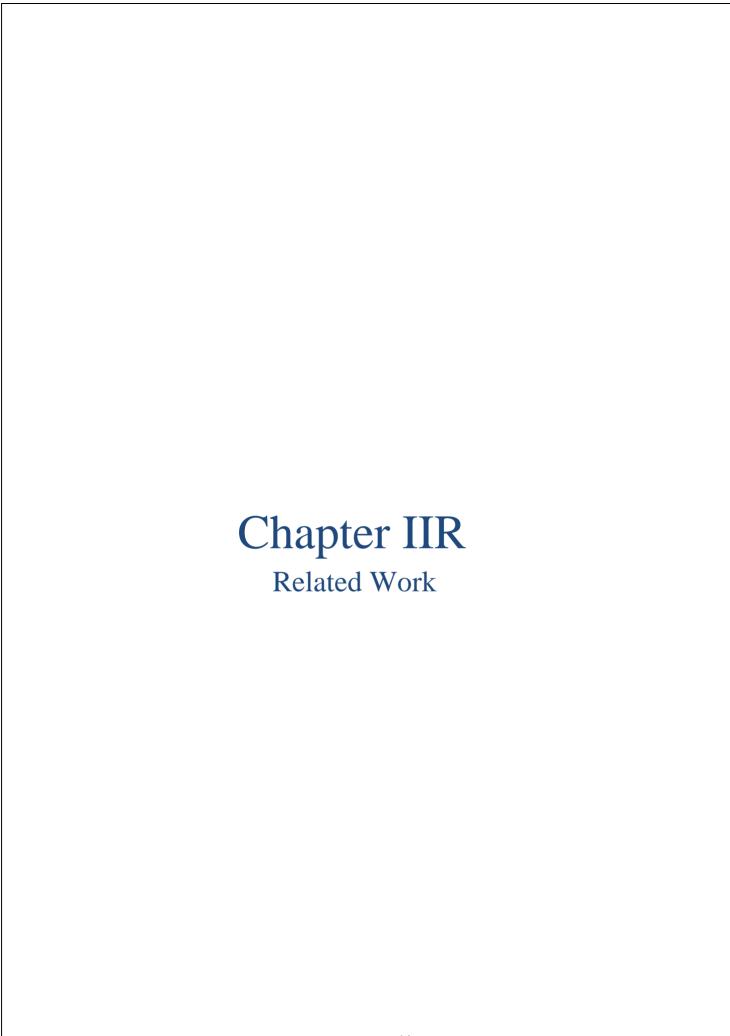

Figure 1.3 Reduce Human Errors

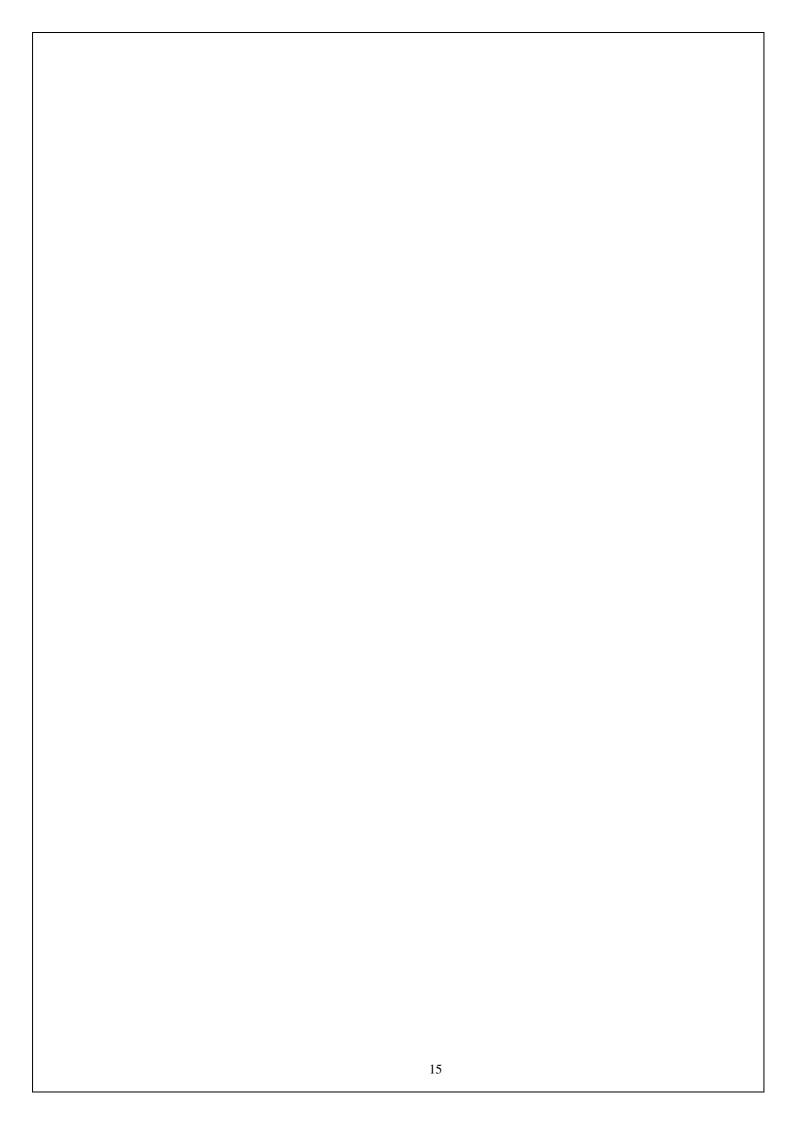4- Reducing the use of paper; as the traditional way of ordering requires a lot of paper work. On the other hand the proposed system solves this problem; leading to reducing the cost of paper used, and also help having a greener environment.

Figure 1.4 Use less Paper

Chapter IIR

Related Work

2.Chapter 2

2.1 Overview

The literature review and related work section of a research project serves as a crucial component in assessing the existing body of knowledge on a specific subject or area of study. This section goes beyond simply summarizing previous research; it involves a comprehensive evaluation of the available literature by contrasting, synthesizing, and providing critical introspection. In this chapter, we aim to showcase similar work that aligns with our objectives and discuss their merits and limitations. Moreover, we will outline how our project can overcome these limitations to differentiate itself and offer novel contributions.

2.2 Related Work

There are numerous related works to a restaurant and hotel management system, including academic studies, software systems, and industry reports. Here are a few examples:

1. "A Review of Restaurant Management System" by J. Zhang and X. Wang: This academic paper provides an overview of restaurant management systems and discusses various features that are commonly included in such systems, such as order management, inventory management, and customer relationship management.

2. "Hotel Management System" by A. Patel and K. Vaghela: This academic paper focuses on hotel management systems and discusses various modules that are typically included in such systems, such as front desk management, room management, and billing management. The paper also discusses the benefits of using such systems, such as increased efficiency and improved customer satisfaction.

3. "Oracle Hospitality Restaurant Management" by Oracle: This software system is designed specifically for restaurant management and includes features such as table management, menu management, and kitchen management. The system also offers analytics and reporting tools to help restaurant owners make informed business decisions.

4. "Hotelogix" by Hotelogix: This software system is designed for hotel management and includes features such as front desk management, housekeeping management, and revenue management. The system is cloud-based, which allows hotel owners to access it from anywhere with an internet connection.

5. "Global Hotel Market Report" by ResearchAndMarkets.com: This industry report provides an overview of the global hotel market and discusses various trends and challenges facing the industry. The report also includes profiles of key players in the

industry and provides market forecasts for the coming years.

Overall, there is a wealth of information available on restaurant and hotel management systems, including academic studies, software systems, and industry reports. These resources can be helpful for restaurant and hotel owners who are looking to implement a management system or improve their existing system.

2.2.1 Sakae Sushi iPad Ordering System

Problem Definition:

Sakae Sushi Malaysia is a Japanese restaurant that has first launched an iPad ordering system through an interactive menu to offer customers a new level of convenience and interactivity. The iPads are displayed at every table on a metal holder.

Advantages

- Customers can search for their favorite dish by typing the specific keywords and it will show all the items based on the specific keywords.
- Customers can keep track of their orders and bill easier

2.2.2 ChowNow

Problem Definition:

ChowNow is an online ordering platform built for mobile and Facebook.

To provide restaurants with an easy way to offer online ordering to customers via either their Facebook page, branded mobile apps for iPhone and iPad, or their existing website.

Advantages:

- Accept orders and set ready times through Tablet. Use Dashboard to update menu on the fly.
- Access valuable data for every order received and get to know customers better than ever.

2.2.3 Yhofoodie
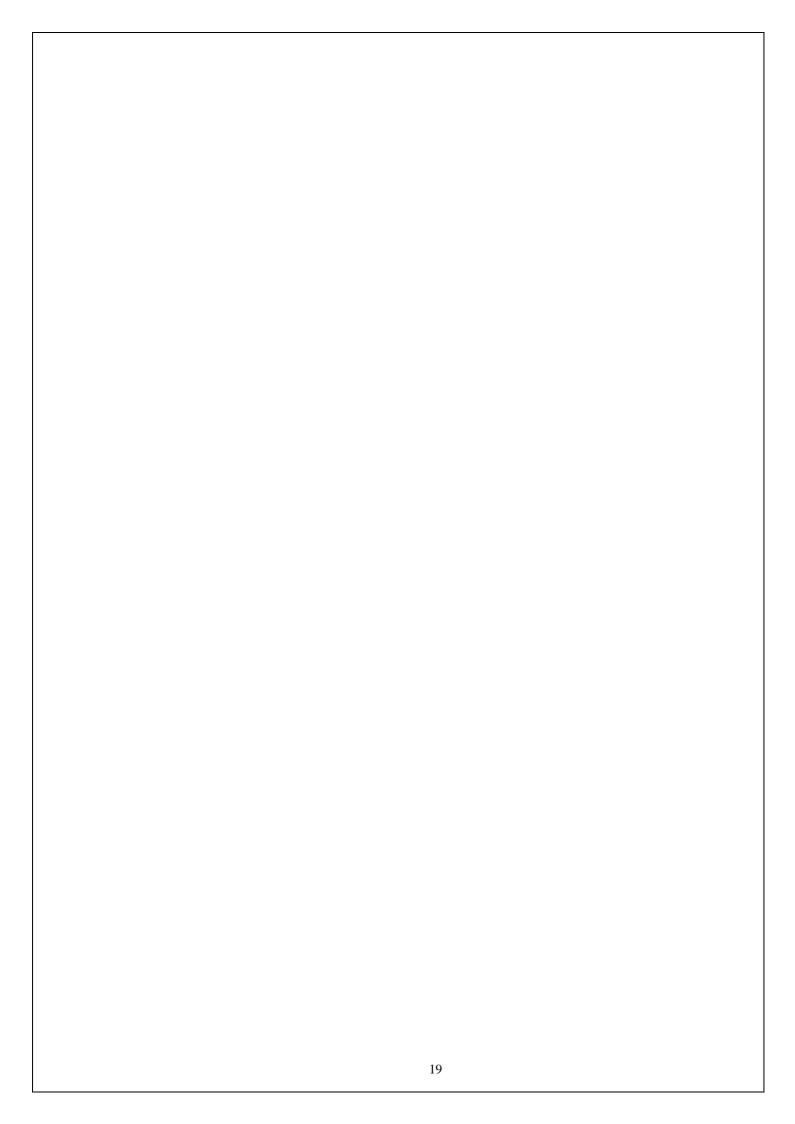
Problem Definition:

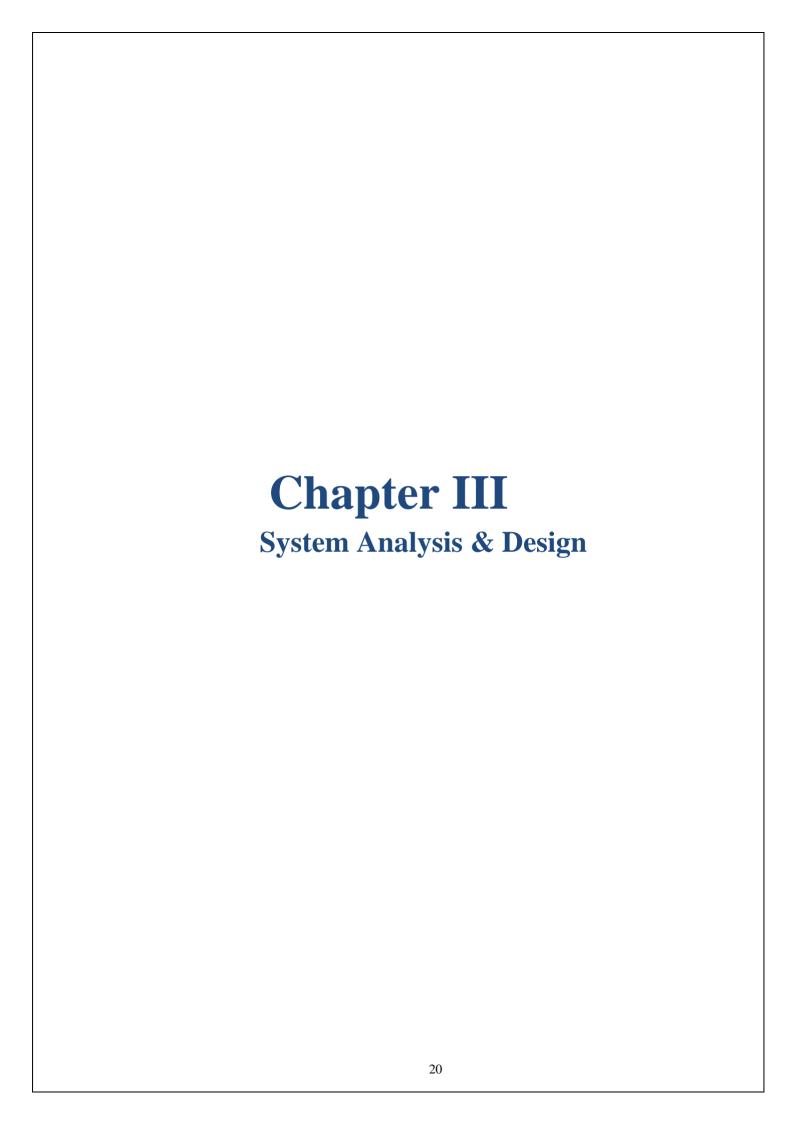Yhofoodie is using a mobile scan code order via android and ios platforms.

The system will generate a separate QR code for each table as a meal window. Kitchen prints, service messages, checkout orders, etc. are all based on the table.

The restaurant also constantly updates the menu so that customers have new dishes from time to time.

Advantages:

- All billing information is saved in the system for easy inquiry at any time. This includes viewing the bill's revision history, operator personnel, operating time, and changing bills.
- The waiter receives customer's order information, service bell message and more in time through the mobile phone.

Chapter III
System Analysis & Design

3.Chapter 3

3.1 Overview

System analysis is the process of studying and analyzing a system to identify its components, functions, and interactions, with the goal of improving its efficiency, effectiveness, and overall performance. In the context of restaurant and hotel management systems, system analysis involves the examination of the various components of the system, such as hardware, software, data, and processes, to ensure that they work together seamlessly and effectively.

System analysis typically involves several steps, including:

1- Requirements gathering: This involves identifying the needs and requirements of the system's users, stakeholders, and customers. This can be done through interviews, surveys, and other forms of data collection.

2- System modeling: This involves creating a model of the system using diagrams and other visualization tools. This can help to identify the components of the system and their relationships.

3- Data analysis: This involves examining the data used by the system, such as customer information, inventory levels, and sales data, to identify trends and patterns that can be used to improve the system's performance.

4- Process analysis: This involves examining the processes used by the system, such as order processing, inventory management, and customer service, to identify areas where improvements can be made.

5- Design and implementation: Based on the results of the analysis, system designers can create a plan to improve the system's performance and implement changes to the system.

System analysis is an important tool for improving the performance of restaurant and hotel management systems. By identifying areas where the system can be improved, system analysts can help to streamline processes, reduce costs, and improve the overall customer experience.

In general, system analysis refers to the process of studying and analyzing a system to identify its components, functions, and interactions, with the goal of improving its efficiency, effectiveness, and overall performance.

In the context of computer science, system analysis typically refers to the process of analyzing computer-based systems, such as software applications, databases, and computer networks. This involves examining the system's various components, such as hardware, software, data, and processes, to ensure that they work together seamlessly and effectively.

System analysis is an important tool in software development, as it helps to ensure that software systems are designed and implemented efficiently and effectively. System analysis can also be used in other fields, such as business administration and engineering, to improve the performance of complex systems.

3.2 System Study

System study is a process of examining and analyzing a system in order to understand its components, functions, and interactions. The goal of system study is to identify areas where the system can be improved, and to develop recommendations for changes that will enhance its performance.

In the context of computer science, system study typically involves examining computer-based systems, such as software applications, databases, and computer networks. This involves studying the system's various components, such as hardware, software, data, and processes, to understand how they work together and to identify potential problems or areas for improvement.

System study typically involves several steps, including:

1. System analysis: This involves studying the system in order to understand its components, functions, and interactions. This may involve gathering information about the system from users, stakeholders, and other sources.

2. Problem identification: This involves identifying problems or issues with the system that are affecting its performance or usability.

3. Requirements gathering: This involves gathering information about the needs and requirements of the system's users and stakeholders.

4. Alternative analysis: This involves considering different solutions or approaches to address the problems identified in the system.

5. Design and implementation: Based on the results of the system study, recommendations can be made for changes to the system that will improve its performance and usability.

System study is an important tool for identifying areas where computer-based systems can be improved, and for developing recommendations for change. By conducting a thorough system study, system analysts can help to ensure that computer-based systems are designed and implemented efficiently and effectively, and that they meet the needs of their users and stakeholders.

3.3 Requirements specification

Requirements specification is the process of documenting and defining the functional and non-functional requirements of a system, software application, or product. The goal of requirements specification is to ensure that the system or product meets the needs and expectations of its users and stakeholders.

In the context of software development, requirements specification typically involves gathering information from users and stakeholders about their needs and expectations for the software application. This information is then documented in a requirements specification document, which serves as a blueprint for the development of the software.

Requirements specification typically involves several steps, including:

1. Requirements gathering: This involves identifying the needs and requirements of the system's users and stakeholders. This can be done through interviews, surveys, and other forms of data collection.

2. Requirements analysis: This involves analyzing the requirements gathered to ensure that they are complete, consistent, and feasible.

3. Requirements documentation: This involves documenting the requirements in a clear and concise manner, using techniques such as use cases, user stories, and functional requirements.

4. Requirements validation: This involves reviewing the requirements with users and stakeholders to ensure that they accurately reflect their needs and expectations.

5. Requirements management: This involves maintaining the requirements throughout the software development process, and ensuring that changes to the requirements are properly documented and managed.

Requirements specification is an important tool in software development, as it helps to ensure that software applications meet the needs and expectations of their users and stakeholders. By documenting the requirements in a clear and concise manner, software developers can ensure that the software is developed efficiently and effectively, and that it meets the needs of its users.

3.3.1 Software Requirements:

Software requirements are the functional and non-functional specifications that describe what a software application must do, and how well it must do it. Requirements are the foundation for software development, as they serve as a blueprint for designing, developing, and testing software systems.

The purpose of the program project is to develop a reliable and easy-to-use application that can help detect and monitor symptoms of depression. The program will aim to identify the methods

of restaurants and hotels. It will provide ease of handling reservation and choosing best dish/meal. Software requirements can be divided into two main categories: functional requirements and non-functional requirements.

3.3.2 Functional and Non-functional Requirement Specification. Functional Requirement (FR)

is a description of the service that the software must offer. It describes a software system or its component. A function is nothing but inputs to the software system, its behavior, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform. Functional Requirements are also called Functional

3.3.2.1 Functional Requirements:

- View menu (Customer)
- View offers and best-sellers (Customer)
- Use filtering (Customer)
- Making an order (Customer)
- Donating a meal to the poor (Customer)
- Paying check (Customer)
- Give feedback (Customer)
- Change default waiting time (Staff)
- Update available dishes in menu (Staff)
- Close table (Staff)
- Follow-up with the payment process (Staff)
- View feedback report (Admin/Owner)
- Update menu items and pricings (Admin/Owner)
- View sales report (Admin/Owner)
- Update available payment methods (Admin/Owner)

3.3.2.2 Non-functional Requirements

- Performance: The software must meet certain response time or throughput requirements.
- Security: The software must protect against unauthorized access, data breaches, and other security threats.
- Usability: The software must be easy to use and navigate for its intended users.
- Reliability: The software must be dependable and perform consistently over time.

Software requirements are typically documented in a requirements specification document, which serves as a blueprint for software development. The requirements document helps to ensure that the software development team and stakeholders have a common understanding of what the software must do, and how well it must do it

3.4. Proposed System:

A proposed system for a restaurant and hotel management system is a new, improved system that is designed to replace or enhance an existing system or process. The proposed system may incorporate new technology, processes, or features that are not currently available in the existing system.

The proposed system may be developed in response to identified problems or limitations with the existing system, or it may be developed to take advantage of new opportunities or technologies that can improve the performance of the restaurant and hotel management system.

The development of a proposed system typically involves several steps, including:

1. Requirements gathering: This involves gathering information from users, stakeholders, and customers about their needs and requirements for the proposed system.
2. System analysis: This involves analyzing the existing system to identify areas where improvements can be made, and to identify the components and functions that will be required in the proposed system.
3. Design: This involves designing the architecture, components, and functions of the proposed system.
4. Development: This involves developing the software, hardware, and processes required for the proposed system.
5. Testing and deployment: This involves testing the proposed system to ensure that it meets the requirements and expectations of users and stakeholders, and deploying the system to production.

A proposed system for a restaurant and hotel management system may include features such as:

- Online reservation management
- Automated order processing

- Inventory management
- Customer relationship management
- Reporting and analytics
- Mobile app integration
- Payment processing
- Social media integration

By developing a proposed system that incorporates these and other features, restaurant and hotel management systems can improve their performance, reduce costs, and enhance the overall customer experience.

3.5. System Architecture

System architecture is the process of designing the overall structure and organization of a system, including its components, functions, and interactions. The architecture of a system serves as a blueprint for its development and implementation.

In the context of restaurant and hotel management systems, system architecture refers to the design of the software, hardware, and processes that are used to manage the various aspects of a restaurant or hotel. This includes the design of the front-end user interface, the back-end database and server infrastructure, and the processes used to manage reservations, orders, inventory, and customer data.

System architecture typically involves several steps, including:

- **Requirements gathering**: This involves gathering information from users, stakeholders, and customers about their needs and requirements for the system.
- **Conceptual design:** This involves creating a high-level design of the system, including its components and interactions.
- **Detailed design:** This involves creating a detailed design of the system, including the software, hardware, and processes required to implement the system.
- **Implementation:** This involves developing and deploying the system, including the software, hardware, and processes required to implement the system.
- **Testing and validation:** This involves testing the system to ensure that it meets the requirements and expectations of users and stakeholders, and validating that it performs as expected in a real-world environment.

System architecture is an important tool for ensuring that restaurant and hotel management systems are designed and implemented efficiently and effectively. By designing a well-structured and organized system architecture, developers can ensure that the system is easy to use, reliable,

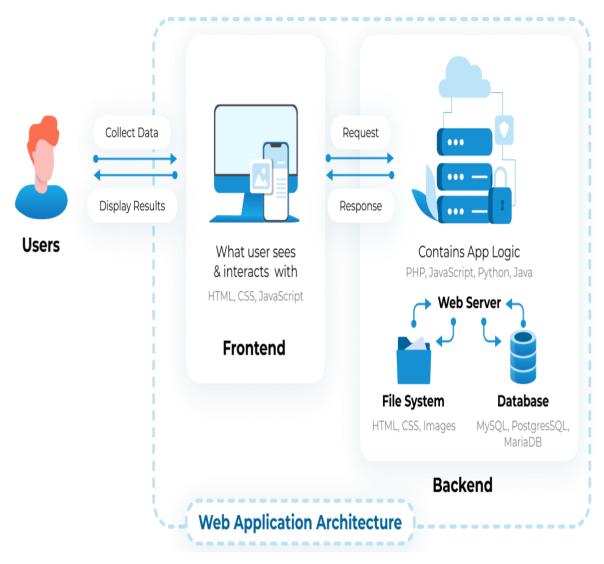and scalable, and that it meets the needs of its users and stakeholders.

Figure 3.1 Architecture System

3.6. System Tools

There are many tools and technologies that can be used to create a website. Some of the most commonly used tools and technologies include:

Software Tools:

- Operating system : [Windows, Linux,. IOS , Android.]
- Coding language : [HTML , CSS ,JS , PHP , React]
- Editor : [VS code.]

Hardware Tools:

- Computer, laptop
- Mobile Phone: Working with Android or IOS

3.7 System Analysis

3.7.1 UML Context Model:

In UML (Unified Modeling Language), a context model is a type of diagram that is used to represent the external environment in which a system operates. It provides a high-level view of the system's interactions with its environment and the various entities that interact with the system. A UML context model typically includes the following components:

1. System boundary: This defines the physical or logical boundaries of the system being modeled.

2. External entities: These represent the various entities that interact with the system, including users, customers, and other systems or applications.

3. Relationships: These represent the interactions and relationships between the system and its external entities, such as inputs, outputs, and data flows.

4. Constraints: These represent any constraints or limitations that affect the interactions between the system and its external entities, such as security requirements or regulatory compliance.

The UML context model is often used in the early stages of software development to help identify the external entities that will interact with the system and to establish the system's requirements. It can also be used to communicate the system's external interactions to stakeholders, helping to ensure that they have a clear understanding of how the system operates and how it will impact their operations.

The UML context model is just one type of diagram in the UML notation, which is a standardized language used to model software systems. Other types of UML diagrams include use case diagrams, class diagrams, sequence diagrams, and activity diagrams, among others. Each of these diagrams serves a specific purpose in the software development process and can be used to model different aspects of the system being developed.

1-Context diagram:

A context diagram is a type of diagram used in system analysis and design to provide a high-level view of a system and its external environment. It is a graphical representation of the system's interactions with its environment and the various entities that interact with the system.
A context diagram typically includes the following components:
1. System boundary: This defines the physical or logical boundaries of the system being modeled.
2. External entities: These represent the various entities that interact with the system, including users, customers, and other systems or applications.
3. Inputs and outputs: These represent the data and information flows between the system and its external entities.
4. Processes: These represent the functions or activities performed by the system to process the inputs and generate the outputs.
Context diagrams are useful for understanding the overall structure and relationships of a system

and its external environment. They can be used to identify the various stakeholders that must be considered during the design and development process, and to establish the system's requirements. Context diagrams are typically created during the early stages of system analysis and design, and can be used to communicate the system's external interactions to stakeholders, helping to ensure that they have a clear understanding of how the system operates and how it will impact their operations.

Context diagrams are often used in conjunction with other types of diagrams, such as data flow diagrams and use case diagrams, to provide a complete and detailed view of the system being modeled.

Figure 3.2 Context Diagram

DFD Level 0 is also called a Context Diagram. It's a basic overview of the whole system or process being analyzed or modeled. It's designed to be an at-a-glance view,

showing the system as a single high-level process, with its relationship to external entities

3.7.2 Interaction models

An interaction model is a type of diagram used in software development to model the interactions between the different components and actors in a system. It provides a visual representation of the flow of information and actions between the various components and actors in the system.

Interaction models are typically used to model complex systems and processes, such as user interfaces, business processes, or software applications.

There are several types of interaction models, including:

Sequence diagrams, State diagrams, Activity diagrams , use case diagrams

1-Use case diagram:

Use-case diagrams describe the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally Every use case contains three essential elements:

- **The actor:** The system user -- this can be a single person or a group of people interacting with the process.

- **The goal:** The final successful outcome that completes the process.

- **The system:** The process and steps taken to reach the end goal, including the necessary functional requirements and their anticipated behaviors.

Other additional elements to consider when writing a use case include:

- Stakeholders, or anybody with an interest or investment in how the system performs.

- Preconditions, or the elements that must be true before a use case can occur.

- Triggers, or the events that cause the use case to begin.

- Post-conditions, or what the system should have completed by the end of the steps.
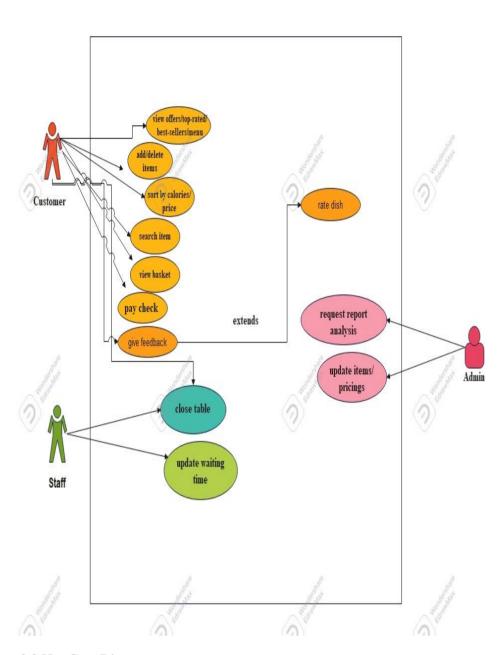
Figure 3.3 Use Case Diagram

2-Sequence diagram:

To understand what a sequence diagram is, it's important to know the role of the Unified Modeling Language, better known as UML. UML is a modeling toolkit that guides the creation and notation of many types of diagrams, including behavior diagrams, interaction diagrams, and structure diagrams.

A sequence diagram is a type of interaction diagram because it describes how—and in what order—a group of objects works together. These diagrams are used by software developers and business professionals to understand requirements for a new system or to document an existing process. Sequence diagrams are sometimes known as event diagrams or event scenarios.

Figure 3.4 Interaction between customer and website

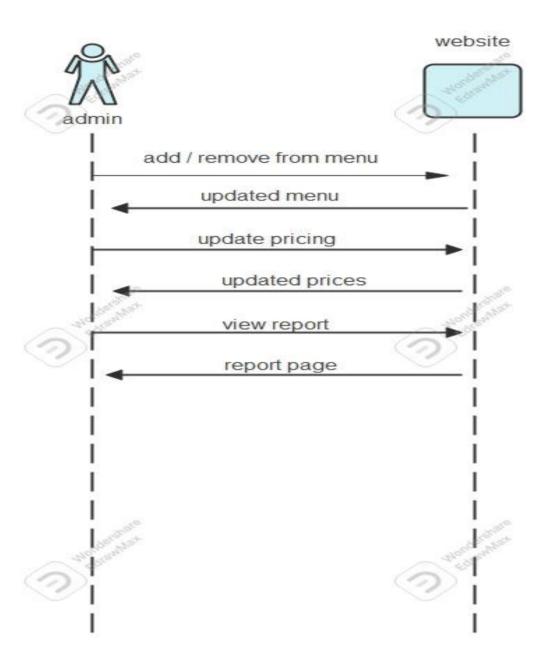Figure 3.5 Interaction between staff and website

Figure 3.6 Interaction between admin and website

3.7.3 Structural models

Structural models

Structural models of software display the organization of a system in terms of the components that make up that system and their relationships. Structural models may be static models, which show the structure of the system design or dynamic models, which show the organization of the system when it is executing. These are not the same things—the dynamic organization of a system as a set of interacting threads may be very different from a static model of the system components.

Structural models which include **class, entity relationship and data flow diagrams**.

1-Class diagram:

Class diagram describes the attributes and operations of a class and also the constraints imposed on the system. The class diagrams are widely used in the modeling of object oriented systems because they are the only UML diagrams, which can be mapped directly with object-oriented languages
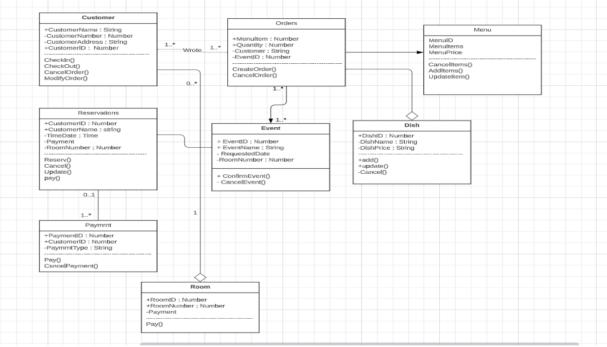

Figure 3.7 Class diagram

The purpose of class diagram is to model the static view of an application. Class diagrams are the only diagrams which can be directly mapped with object-oriented languages and thus widely used at the time of construction.

UML diagrams like activity diagram, sequence diagram can only give the sequence flow of the application, however class diagram is a bit different. It is the most popular UML diagram in the coder community.

The purpose of the class diagram can be summarized as −

- Analysis and design of the static view of an application.

- Describe responsibilities of a system.
- Base for component and deployment diagrams.
- Forward and reverse engineering.

2-Entity relationship diagram (ERD):

An Entity Relationship (ER) Diagram is a type of flowchart that illustrates how "entities" such as people, objects or concepts relate to each other within a system. ER Diagrams are most often used to design or debug relational databases in the fields of software engineering, business information systems, education and research. Also known as ERDs or ER Models, they use a defined set of symbols such as rectangles, diamonds, ovals and connecting lines to depict the interconnectedness of entities, relationships and their attributes. They mirror grammatical structure, with entities as nouns and relationships as verbs.

ER diagrams are related to data structure diagrams (DSDs), which focus on the relationships of elements within entities instead of relationships between entities themselves. ER diagrams also are often used in conjunction with data flow diagrams (DFDs), which map out the flow of information for processes or systems.
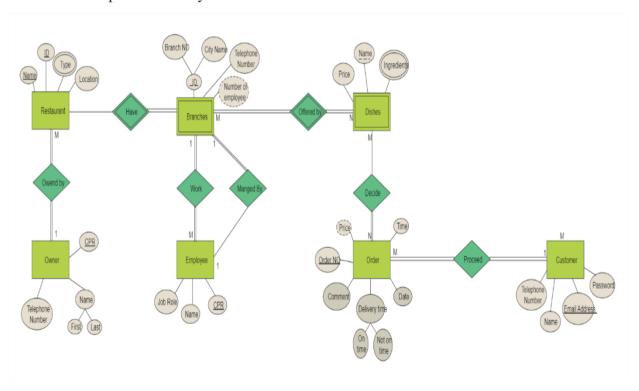

Figure 3.8 ERD diagram

3-Data flow diagram (DFD):

A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination. Data flowcharts can range from simple, even hand-drawn process overviews, to in-depth, multi-level DFDs that dig progressively deeper into how the data is handled. They can be used to analyze an existing system or model a new one. Like all the best diagrams and charts, a DFD can often visually "say" things that would be hard to explain in words, and they work for both technical and nontechnical audiences, from developer to CEO. That's why DFDs remain so popular after all these years. While they work well for data flow software and systems, they are less applicable nowadays to visualizing interactive, real-time or database-oriented software or systems.
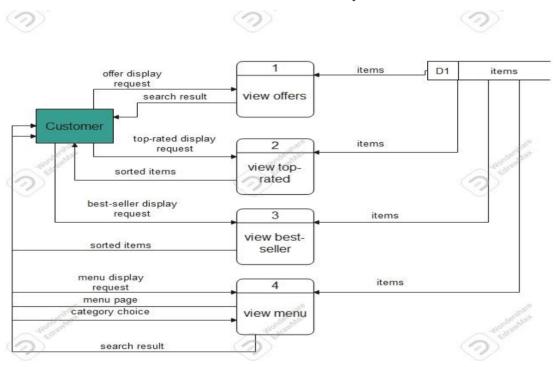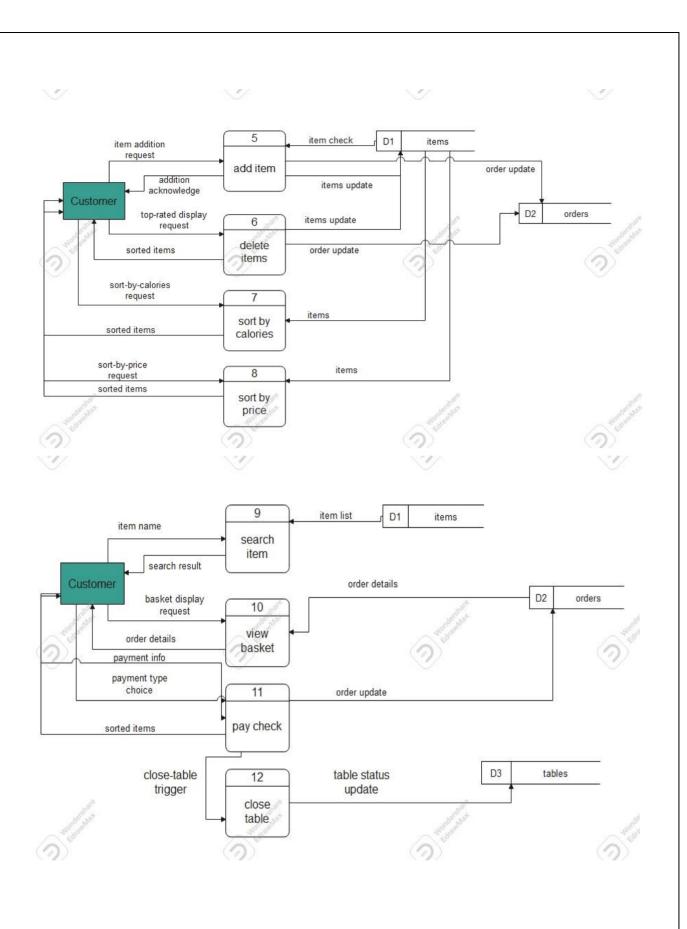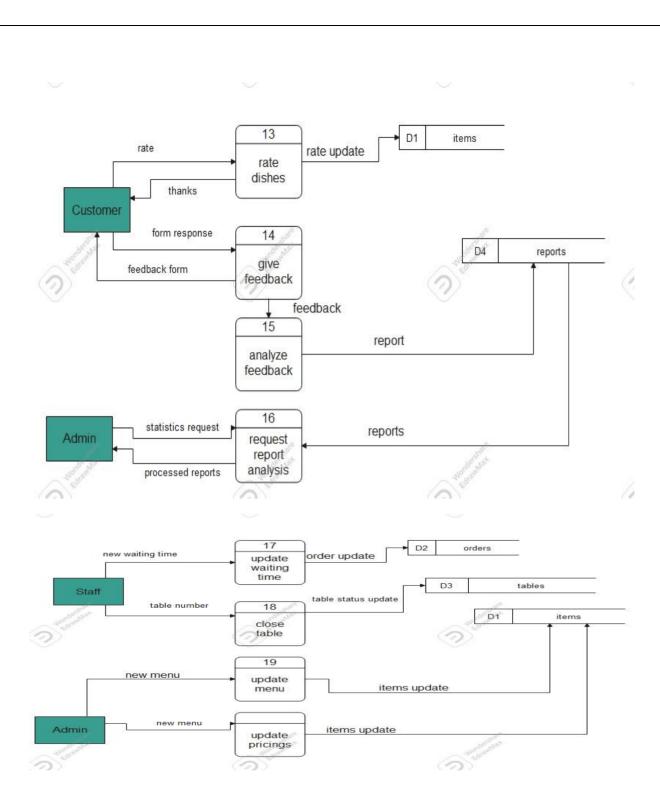
Figure 3.9 DFD Level 1

3.7.4 Behavioral models

Behavioral modeling is an approach used by companies to better understand and predict consumer actions. Behavioral modeling uses available consumer and business spending data to estimate future behavior in specific circumstances. Behavioral modeling is used by financial institutions to estimate the risk associated with providing funds to an individual or business and by marketing firms to target advertising. Behavioral economics also relies on behavioral modeling to predict behaviors of agents that fall outside of what would be considered entirely fact-based or rational behavior.

1-Activity diagram:

Activity Diagrams describe how activities are coordinated to provide a service which can be at different levels of abstraction. Typically, an event needs to be achieved by some operations, particularly where the operation is intended to achieve a number of different things that require coordination, or how the events in a single use case relate to one another, in particular, use cases where activities may overlap and require coordination.

An activity diagram visually presents a series of actions or flow of control in a system similar to a flowchart or a data flow diagram. Activity diagrams are often used in business process modeling. They can also describe the steps in a use case diagram. Activities modeled can be sequential and concurrent.
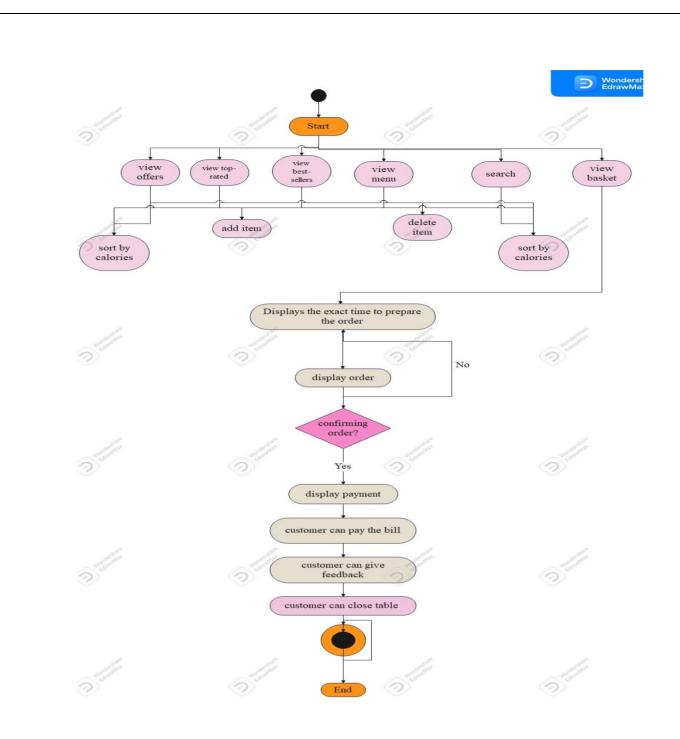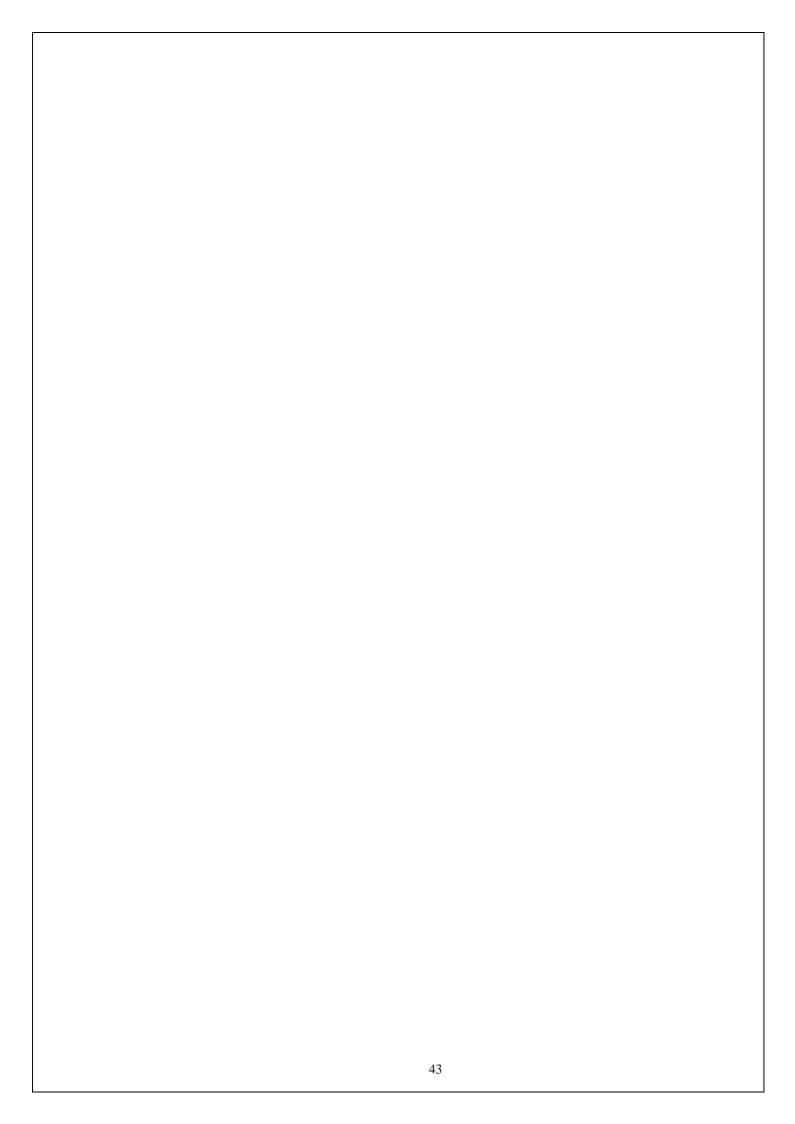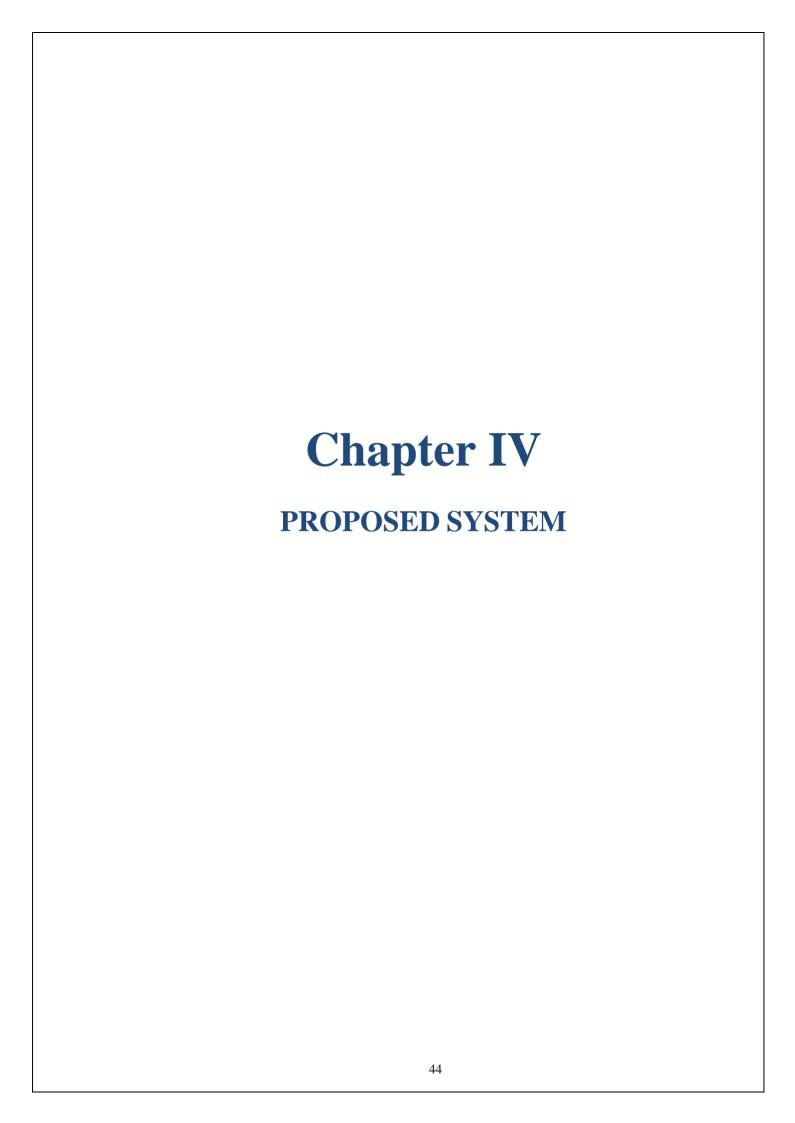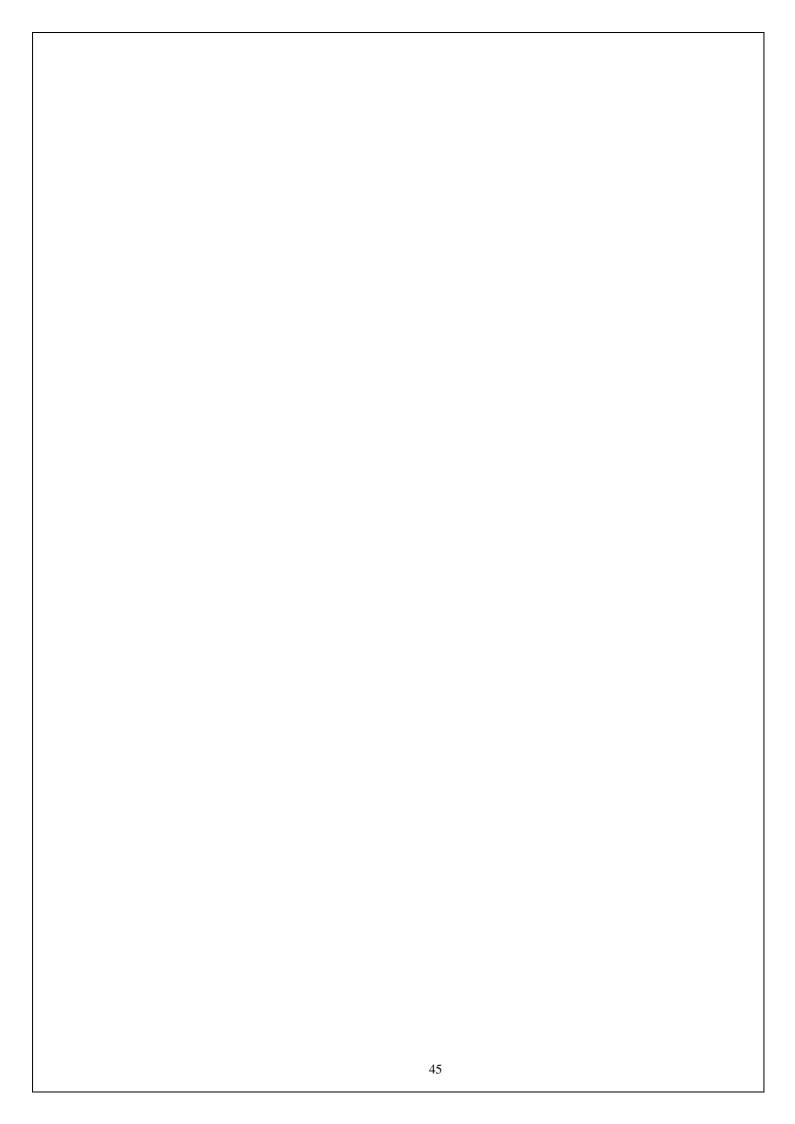
Figure 3.10 Activity diagram

Chapter IV

PROPOSED SYSTEM

4.Chapter 4

4.1 overview

A proposed restaurant and hotel management system is a software application that is designed to improve the operational efficiency and customer experience of restaurant and hotel operators. The proposed system aims to streamline the various aspects of running a restaurant or hotel, including reservation management, table management, order processing, inventory management, customer relationship management, and reporting and analytics.

The proposed system will include a user-friendly interface that is easy to navigate and intuitive to use. It will provide real-time information about restaurant and hotel operations, allowing operators to make informed decisions and respond quickly to changes in the environment.

One of the key features of the proposed system will be its ability to integrate with other software applications and services, such as online ordering platforms, delivery services, and accounting software. This will allow operators to manage their entire operation from a single platform, reducing the need for manual data entry and improving accuracy and efficiency.

The proposed system will also include advanced reporting and analytics capabilities, allowing operators to track key performance metrics and identify areas for improvement. This will help operators to make data-driven decisions and optimize their operations for maximum efficiency and profitability.

In addition to these core features, the proposed system may also include additional modules or integrations that provide additional functionality, such as employee scheduling, marketing and promotions, and loyalty programs.

Overall, the proposed restaurant and hotel management system is designed to provide a comprehensive and integrated solution for restaurant and hotel operators, helping them to manage their operations more efficiently, improve the customer experience, and ultimately drive growth and profitability.

4.2.Proposed Algorithms

Here is a proposed algorithm that could be used in a website for a restaurant and hotel management system:

1. Initialize the system and load any necessary data.
2. Display a user interface that allows users to select the type of operation they wish to perform (e.g., reservation management, table management, order processing, etc.).
3. Based on the user's selection, display a form or interface that allows the user to input or modify data related to that operation.
4. Validate the user's input and perform any necessary calculations or data processing.
5. If the operation involves updating or modifying data in the system (e.g., creating a new reservation or updating a customer record), save the changes to the system's database.
6. If the operation involves retrieving data from the system (e.g., displaying a list of available tables or retrieving a customer's reservation details), query the system's database and display the relevant information to the user.
7. Provide feedback to the user on the success or failure of the operation, and any additional information or instructions needed to complete the task.
8. Repeat the process as necessary for additional operations or tasks.
9. When the user is finished using the system, save any changes to the database and close the system.

This algorithm could be used to implement a variety of different features and functions in a restaurant and hotel management system website, depending on the specific needs and requirements of the system. By providing a clear and intuitive user interface, validating user input, and performing necessary data processing and calculations, the system can help to streamline operations and improve the overall user experience**.**

List Of used algorithms :

4.2.1 Sorting algorithm:

Sorting algorithms are algorithms that reorder elements in a list or array in a specific order. The most common sorting algorithms are used to sort elements in ascending or descending order.

Some commonly used sorting algorithms include:

1. Bubble Sort: This algorithm repeatedly compares adjacent elements in a list and swaps them if they are in the wrong order. The algorithm continues until no more swaps are necessary.
2. Selection Sort: This algorithm repeatedly selects the smallest element in a list and swaps it with the first unsorted element in the list. The algorithm continues until the entire list is sorted.

3. Insertion Sort: This algorithm builds the final sorted array one item at a time by inserting each unsorted element into its proper place in the sorted array.

4. Quick Sort: This algorithm divides the list into two smaller sub-lists based on a pivot element, and then recursively sorts each sub-list.

5. Merge Sort: This algorithm divides the list into smaller sub-lists and then combines them in a sorted order.

Each sorting algorithm has its own strengths and weaknesses, and the best algorithm to use depends on factors such as the size of the list, the distribution of elements in the list, and the available computing resources.

Sorting algorithms are an important part of computer science and are used in a wide range of applications, from organizing data in databases and search engines to optimizing computer graphics and game programming.

4.2.2 Searching algorithms:

Searching algorithms are algorithms that are used to find a specific element or value within a collection of data. These algorithms are used in a wide range of applications, including databases, search engines, and artificial intelligence.

Here are some commonly used searching algorithms:

1. Linear Search: This algorithm sequentially checks each element in the list until it finds the target element or reaches the end of the list.

2. Binary Search: This algorithm is used to search a sorted list by repeatedly dividing the list in half and comparing the target element to the middle element of the list. The search continues on the half of the list that contains the target element until the element is found or the search is completed.

3. Interpolation Search: This algorithm is used to search a uniformly distributed sorted list by estimating the position of the target element based on its value.

4. Depth-First Search: This algorithm is used to traverse a graph or tree structure by visiting each node in depth-first order until the target element is found.

5. Breadth-First Search: This algorithm is used to traverse a graph or tree structure by visiting all nodes at a given depth level before moving on to the next level.

Each searching algorithm has its own strengths and weaknesses, and the best algorithm to use depends on factors such as the size of the data set, the distribution of elements in the data set, and the available computing resources.

Searching algorithms are a fundamental concept in computer science and are used in a wide range of applications, from data analysis and machine learning to network routing and game

programming.

4.3.Methodologies

Agile methodologies are a set of software development practices that prioritize flexibility, collaboration, and iterative development. Agile methodologies are based on the Agile Manifesto, which was developed in 2001 by a group of software developers who were seeking to improve the traditional approach to software development.

Agile methodologies emphasize working in small teams, frequent communication and collaboration, and adapting to changing requirements and priorities. Some common Agile methodologies include:

1. Scrum: This is a framework for Agile development that emphasizes small, self-organizing teams working in sprints (usually two to four weeks long) to deliver working software incrementally.

2. Kanban: This is a visual framework for Agile development that emphasizes continuous delivery of software by limiting work in progress and using visual signals to communicate progress and priorities.

3. Extreme Programming (XP): This is a set of practices for Agile development that emphasizes frequent releases, customer involvement, and continuous testing and integration.

Agile methodologies are designed to be flexible and adaptable, allowing development teams to respond quickly to changing requirements and customer needs. Agile methodologies also emphasize continuous improvement, with teams constantly seeking to improve their processes and practices over time.

Some benefits of Agile methodologies include faster time to market, improved quality, increased collaboration and communication, and greater flexibility and adaptability. However, Agile methodologies also require a high degree of discipline and communication among team members, and may not be suitable for all types of projects or organizations.
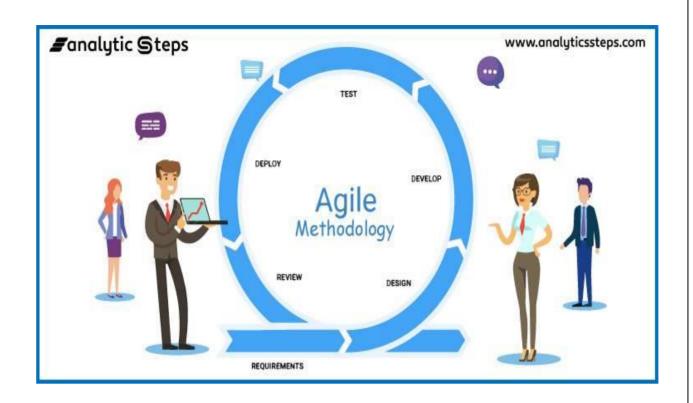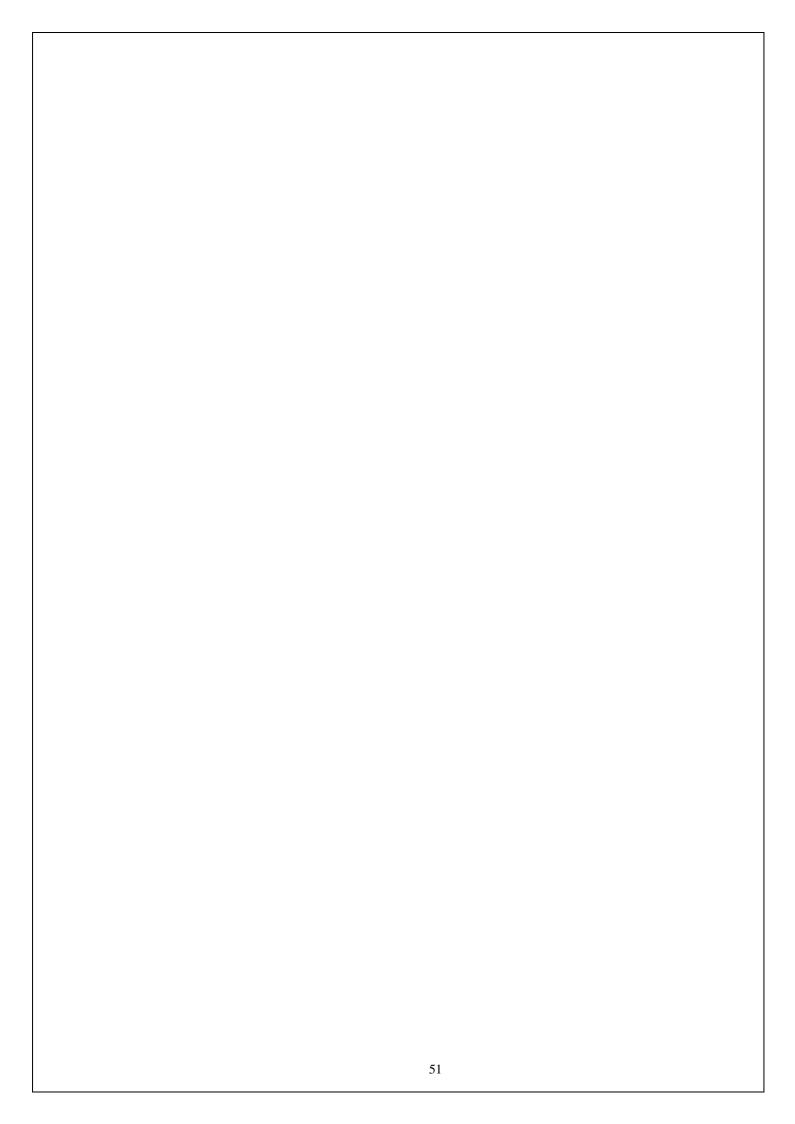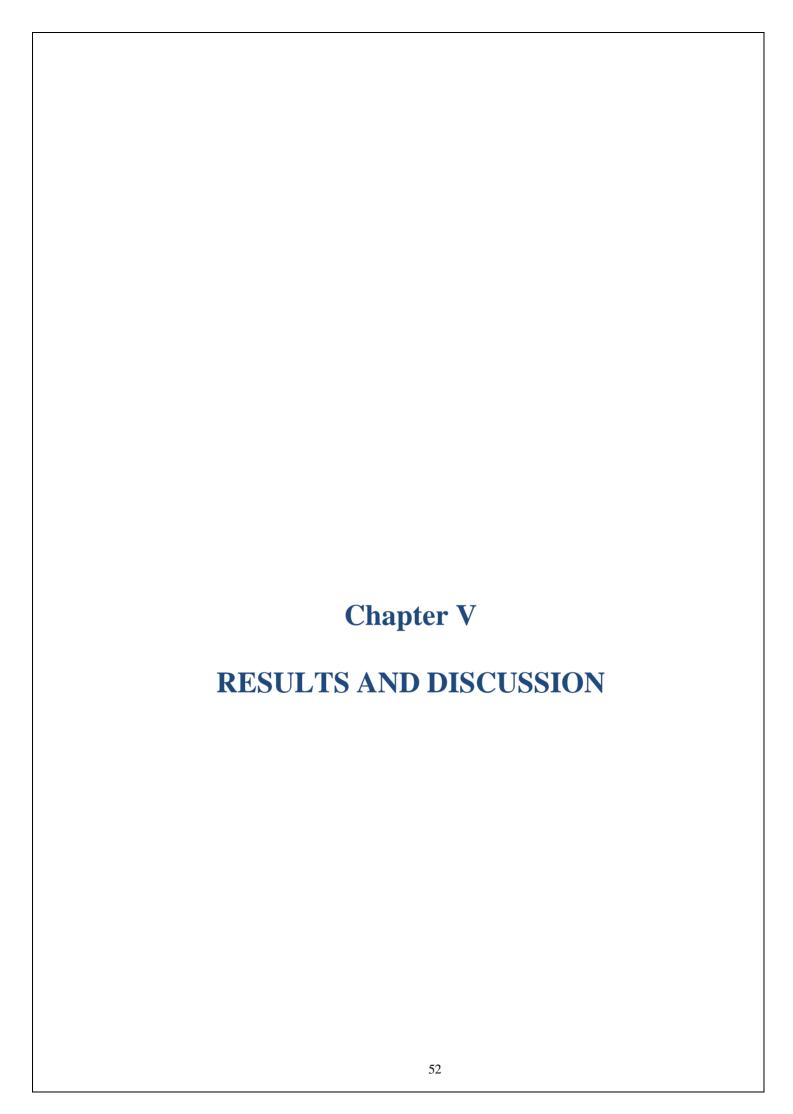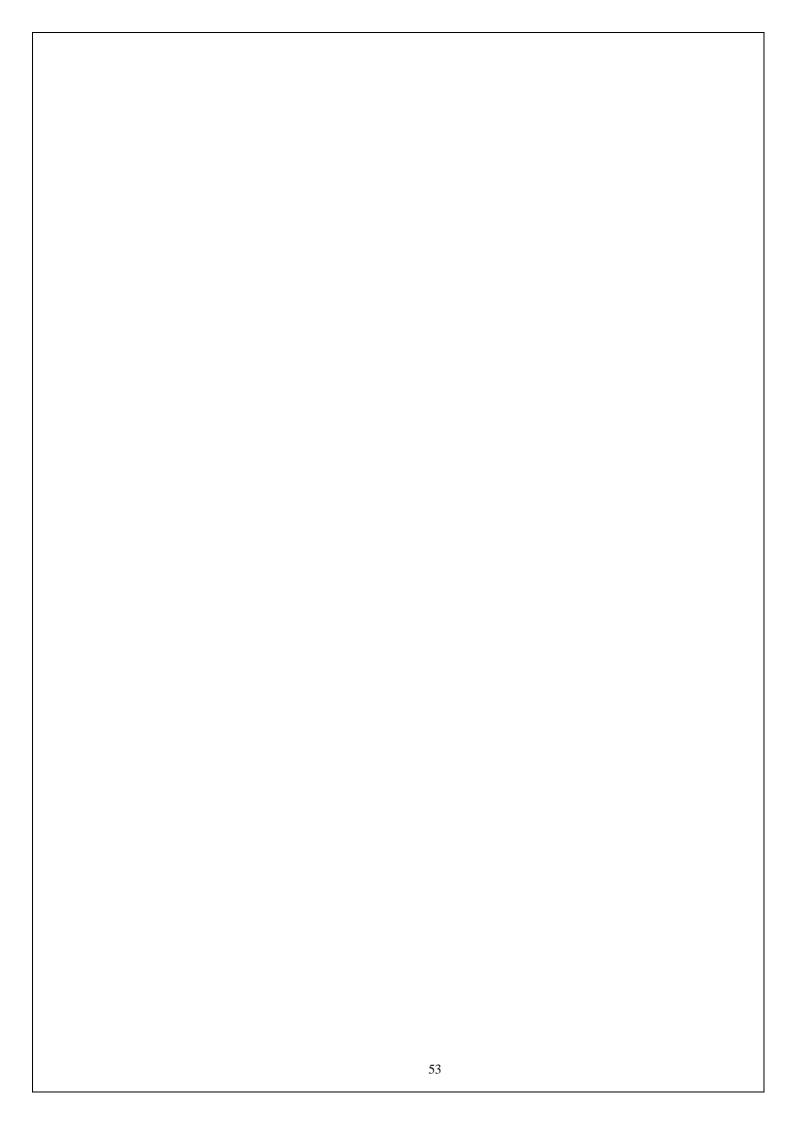
Figure 4.1 Agile Methodologies

4.4. Time Plan

	A	B	C	D	E
1	Task no.	Task	Date	Duration	Progress
2	Phase1:Introduction				
3	Task1.1	Abstract	29-Oct-22		100%
4	Task1.2	Introduction	30-Oct-22		100%
5	Task1.3	Problem Definition	30-Oct-22		100%
6	Task1.4	Project objectives	30-Oct-22		100%
7	Task1.5	Related works	2-Nov-22		30%
8	Task1.6	System Architecture		4 Days	0%
9	Task1.7	Proposed S/W and H/W	2-Nov-22		100%
10	Task1.8	Expected outcomes			0%
11	Task1.9	Research Paper	3-Nov-22		10%
12	Task1.10	References	3-Nov-22		15%

Figure 4.2 Time Plan

Chapter V

RESULTS AND DISCUSSION

5.Chapter
5.1 Result Discussion:

In this chapter, The restaurant and hotel management system is a comprehensive software solution designed to streamline the various aspects of running a restaurant or hotel, including reservation management, table management, order processing, inventory management, customer relationship management, and reporting and analytics.

Overall, the restaurant and hotel management system has shown promising results in improving the operational efficiency and customer experience of restaurant and hotel operators. The system has demonstrated the ability to reduce manual data entry and paperwork, improve accuracy, and increase productivity, allowing operators to focus on delivering a high-quality experience to their guests.

With the reservation management feature, the system has helped operators to manage reservations more efficiently, reducing the risk of overbooking and optimizing room utilization. The table management feature has also helped to optimize seating arrangements, reduce wait times for customers, and improve the overall dining experience.

The system's inventory management feature has helped operators to reduce waste and optimize inventory levels, resulting in cost savings and improved profitability. The reporting and analytics capabilities have provided operators with real-time information about their operations, allowing them to track key performance metrics and identify areas for improvement.

One of the key benefits of the restaurant and hotel management system is its ability to integrate with other software applications and services, such as online ordering platforms, delivery services, and accounting software. This has allowed operators to manage their entire operation from a single platform, reducing the need for manual data entry and improving accuracy and efficiency.

However, it is important to note that the success of the restaurant and hotel management system depends on factors such as the size of the operation, the complexity of the operation, and the availability of computing resources. Additionally, the system may require a learning curve for operators and staff who are not familiar with the software.

In conclusion, the restaurant and hotel management system has shown promising results in improving the operational efficiency and customer experience of restaurant and hotel operators. The system's features and benefits have helped to streamline operations, reduce errors, and improve profitability. However, the success of the system will depend on factors such as the size and complexity of the operation, and the availability of computing resources.

5.2 System implemented:

We will preview some screenshots of the system being implemented.

5.2.1 Login/signup

user enter information like name , password , phone number to start using website , then when user create the account successfully user can using this web without login again.
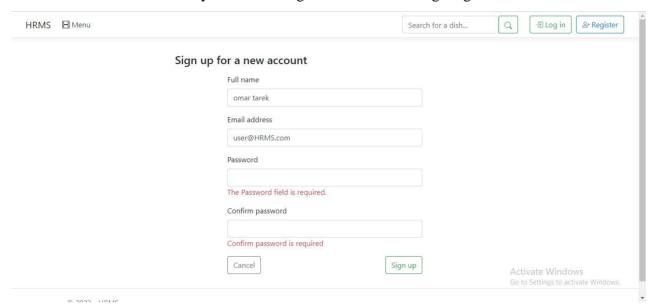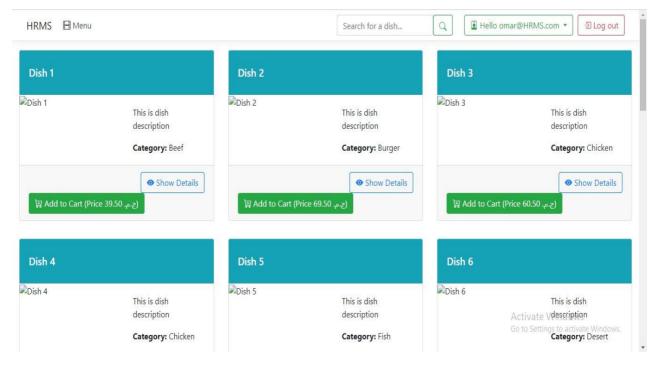

Figure 5.1 login/signup

5.2.2 Home Page

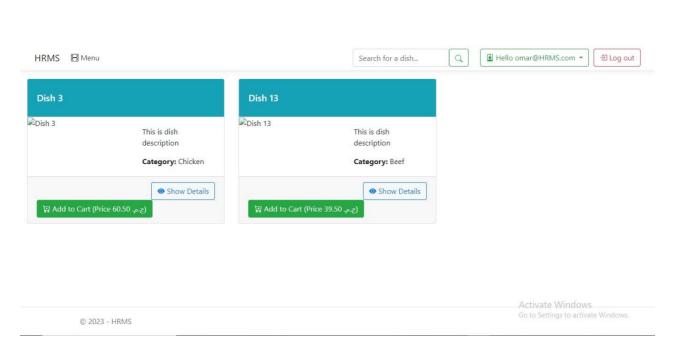Home page of our site that have some information about the site .

Figure 5.2 Home page

5.2.3 Menu Page

user can see menu page for all restaurants in hotel and can choose any dishes/ meals with show more details for all dishes/meals
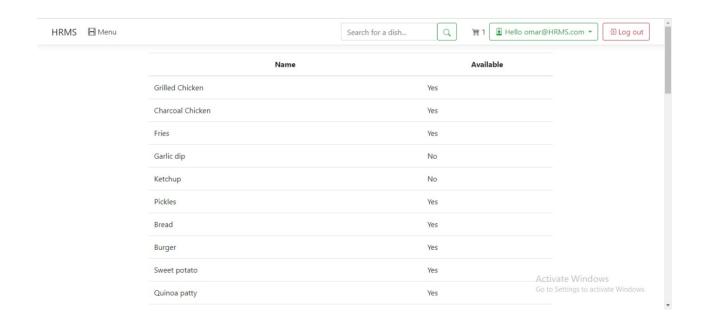

Figure 5.3 menu Page

5.2.4 Details Dish

The user can choose the dish he wants and then show more details about that dish if it is available or not, and he can add or remove anything.
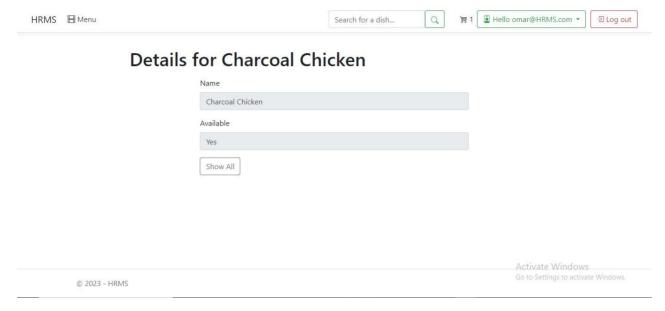

Figure 5.4 Dish Details

5.2.5 Cart / Confirm Order

In this page , when user choose dish and confirm order this website it provide payment method where user can pay by credit card or cash or by room number and in this cart page can add / remove dish before confirm order
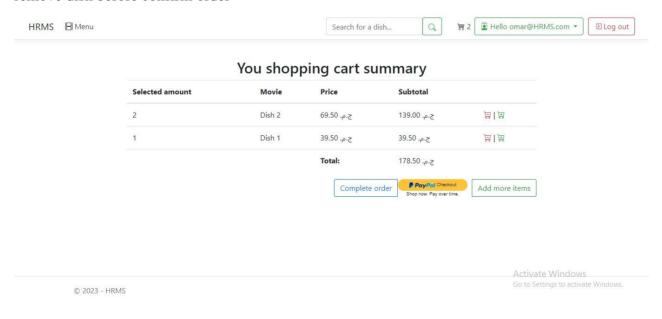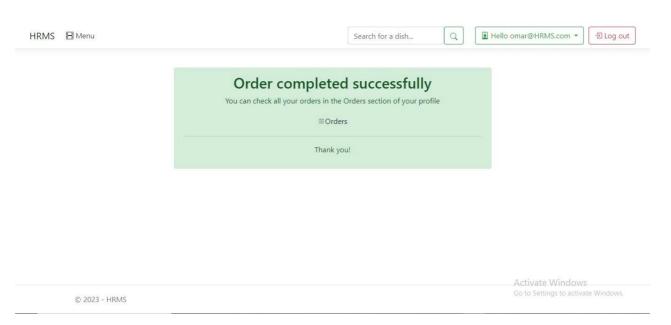

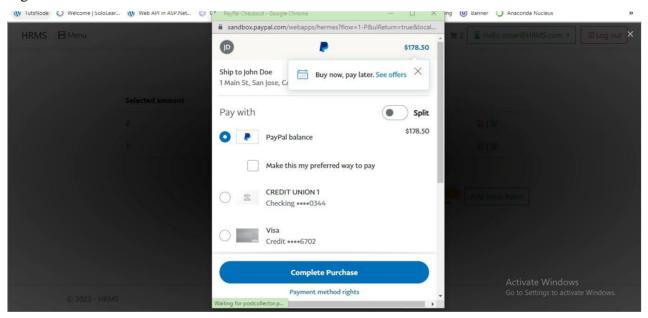Figure 5.5 cart

Figure 5.6 confirm order

Figure 5.7 Payment Method

5.2.6 Admin

Admin can add / remove dish are not-available and can update menu / price and can check order and payment
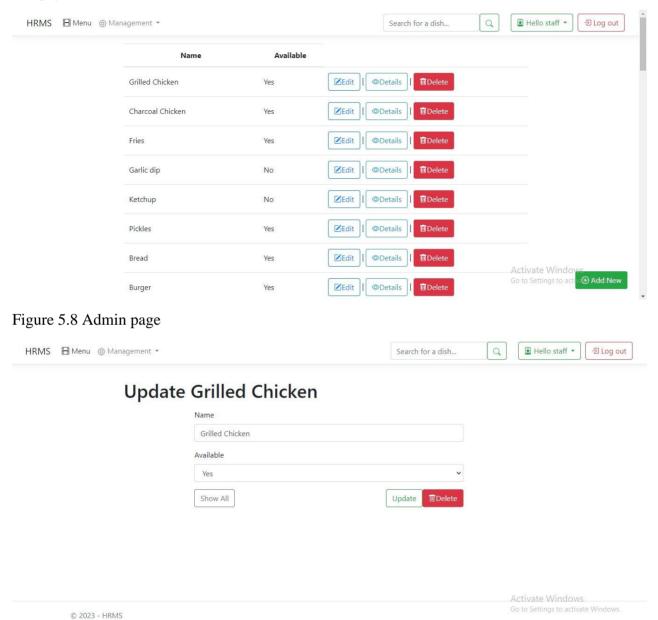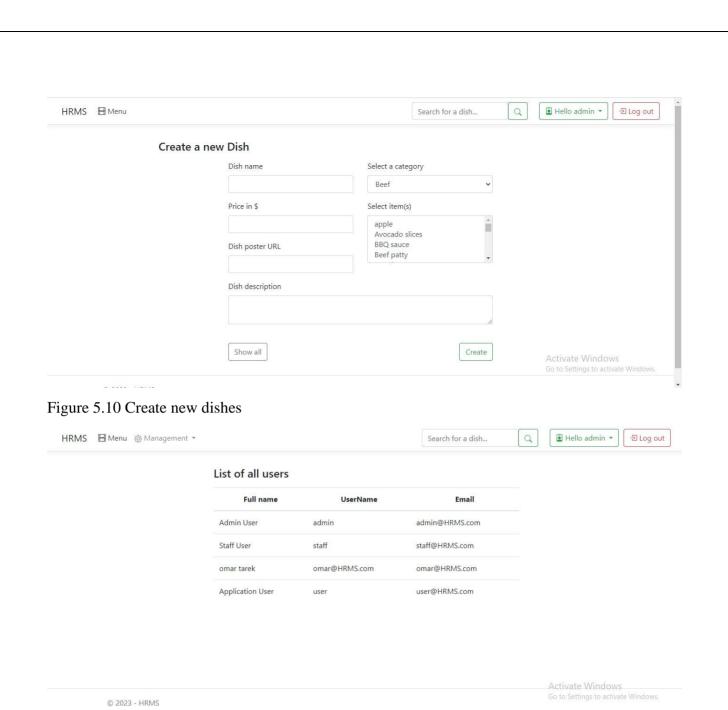

Figure 5.8 Admin page

Figure 5.9 update menu

Figure 5.10 Create new dishes

Figure 5.11 Staff only

List of all your orders

Order ID	Items	Total	User
4	3 [69.50 .ج.م] - Dish 2 1 [120.50 .ج.م] - Dish 11	329.00 .ج.م	user
5	2 [69.50 .ج.م] - Dish 2 1 [39.50 .ج.م] - Dish 1	178.50 .ج.م	omar@HRMS.com
6	1 [39.50 .ج.م] - Dish 1	39.50 .ج.م	omar@HRMS.com

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Activate Windows
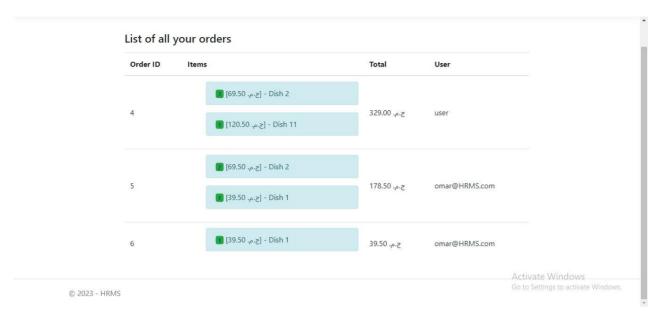Go to Settings to activate Windows.

Figure 5.12 only staff orders

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تقديم تقرير مشروع التخرج لمتطلبات منح درجه بكالوريوس العلوم

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م . أيه محمود

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