

**HOTEL AND RESTAURANT MANAGEMENT SYSTEM:
LOGISTICS 2 (PROCUREMENT, VENDOR PORTAL,
AUDIT MANAGEMENT, DOCUMENT TRACKING
SYSTEM) WITH PREDICTIVE ANALYTICS
USING PHP-ML**

A Capstone

Presented to the Faculty of
The College of Computer Studies
Bestlink College of the Philippines

In Partial Fulfilment
Of the Requirements for the Degree of
Bachelor of Science in Information Technology

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October 2024

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This capstone entitled **HOTEL AND RESTAURANT MANAGEMENT SYSTEM: LOGISTICS 2 (PROCUREMENT, VENDOR PORTAL, AUDIT MANAGEMENT, DOCUMENT TRACKING SYSTEM) WITH PREDICTIVE ANALYTICS USING PHP-ML**, prepared and submitted by **Elaisa Grace B. Arca, Asmin H. Solaiman Boga, Mheera Ann Valerie T. Conwi, Kier Salise, Sheila D. Velasco** in partial fulfillment of the requirements for the degree of Bachelor of Science in Information Technology, has been examined and is recommended for acceptance and approval Pre Oral Defense.

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ACKNOWLEDGEMENT

The researchers would like to express their heartfelt thanks and gratitude to the following persons who, in one way or another, have contributed much, and extended the willingness and support needed to make this research possible:

Dr. Maria M. Vicente, President/CEO, Bestlink College of the Philippines, for her generosity and kind heart in establishing this institution and giving opportunities to those less fortunate students to continue their studies and pursue their dreams;

Ms. Edith M. Vicente, Executive Vice President, for providing the needed information to complete this research;

Dr. Charlie I. Cariño, Vice President for Academic Affairs, for his support and encouragement to make this thesis writing possible;

Engr. Diosdado T. Llano, Vice President for Administration and Finance, for his words of encouragement and motivation;

Dr. Joy Evelyn A. Ignacio, Director, Center for Research and Development, for her good heart to extend the help needed by the researchers.

Dr. Rosicar E. Escobar, Dean, College of Computer Studies of Bestlink College of the Philippines, for providing guideline documentation in the capstone project.

Mr. Rommel J. Constantino, Program Head, Bachelor of Science in Information Technology, for the constant supervision as well as providing necessary information regarding the project and for his support in completing this project

Mr. Ronald G. Roldan Jr., Research Coordinator, to help us in improving our research and guide us in completing this project.

Ms. Marifel J. Laynesa, Capstone Adviser, for giving us suggestions and ideas to improve our research and guiding us in completing this project.

Panelists, **Reynante E. Ponay, CpE, Engr. Junnel E. Avestro, and Mr. Glenox O. Luzong**, extended their effort and time to be able to constructively criticize this thesis and share their knowledge with them to deepen and widen their needed information.

Families and Friends, for all the financial and moral support that have enabled the researchers to triumph over all the challenges, especially during the lowest time that served as their inspiration to complete this study; and

Above all, to the **Almighty God**, for the strength and knowledge that were used for the accomplishment of this research journey.

THE RESEARCHERS

DEDICATION

This business research study is wholeheartedly dedicated first and foremost to the researchers, for executing dedication, time, effort, motivation, sacrifice, and courage to make this study a fruitful and successful piece of work.

To our beloved parents who have been our inspiration and gave us strength when we thought of giving up, who continually provide their moral, spiritual, emotional, and financial support.

To each sibling and circle of friends who shared their words of advice and encouragement to finish this study.

To the research advisers and professors, for extending help by giving guidance, supervision, time, and wisdom to the researchers in conducting this business research study.

And lastly, above all, to our Almighty God, for giving guidance, strength, power of mind, protection, skills, and for giving us a healthy life. All of these we offer to you.

THE RESEARCHERS

ABSTRACT

**Title: HOTEL AND RESTAURANT MANAGEMENT SYSTEM:
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**Major: Information Management, Information Security, Network
Administrative**

Date of Completion:

The "Hotel and Restaurant Management System: Logistics 2 (Procurement, Vendor Portal, Audit Management, Document Tracking System) with Predictive Analytics using PHP-ML" is an advanced software solution developed to enhance logistical processes within the hotel and restaurant sectors. By centralizing and automating logistics functions, the system allows hotels and restaurants to streamline inventory procurement,

establish efficient vendor relationships, maintain compliance through effective audits, and organize critical documents efficiently.

The procurement module optimizes inventory levels by forecasting demand, ensuring cost-effective sourcing, and reducing inventory costs. Through the vendor portal, suppliers gain real-time access to orders, delivery updates, and invoices, fostering transparent communication and strengthened vendor partnerships. The audit management component monitors compliance with regulatory standards and operational protocols, while the document tracking system manages contracts, audit reports, and procurement documentation, ensuring easy retrieval and enhanced document security.

Leveraging predictive analytics powered by PHP-ML, the system analyzes historical data to anticipate trends, optimize inventory replenishment, and enhance supplier performance assessments. This data-driven approach enables proactive decision-making, minimizes stockouts and waste, and supports continuous operational improvements. With this comprehensive solution, hospitality managers gain the tools to improve operational efficiency, enhance customer satisfaction, and optimize resource utilization in a competitive industry landscape.

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Chapter 1

1.1. Background of the Capstone Project

The hotel sector is becoming more and more competitive, thus effective resource management is essential to business success. This Capstone Project aims to calibrate more focus on document tracking, vendor management, audit management, and procurement in addition to a PHP-ML-powered predictive analytics component. The researchers create a strategy that will make use of machine learning capabilities to offer insightful analysis and encourage data-driven decision-making. The researchers determined that to handle the difficulties the industry's logistical operations encounter, there is an urgent need for an effective Hotel and Restaurant Management System. The demands on procurement, vendor management, audits, and document tracking are rising due to the hotel and restaurant industry's explosive development and complexity. The goal of the researchers is to create a complete HRMS that facilitates logistics processes and boosts productivity and efficiency. This project tackles major issues that hotels and restaurants deal with, like enhancing vendor relationships, expediting the procurement process, and guaranteeing compliance through effective audit management. Integrating

a vendor portal promotes openness and cooperation by allowing for real-time communication, order tracking, and supplier performance evaluation.

The Researchers have created a customized HRMS to meet the unique requirements of the client and optimize their operations since they do not currently have a comprehensive logistics system. Effective and efficient resource management is made possible by our HRMS, which offers a consolidated platform for managing vendor relationships, procurement, audits, and document monitoring. This solution will assist the client become more competitive in the hotel industry overall as well as increase operational efficiency.

1.2. Context and Scope

The researchers have carefully defined the focus of the HRMS project to target the essential areas that would be most beneficial for the hotel and restaurant sectors. The hotel and restaurant industry is a dynamic and highly competitive market where the HRMS project is located. This position presents several unique opportunities and problems, such as supply chain diversity, quick expansion, and the need for data-driven decision-making. The researchers aim to manage expectations and prevent the project from expanding beyond its intended boundaries.

1.3. Problem Statement

The researchers have pinpointed various crucial issues that the HRMS project seeks to tackle, including:

1. The lack of predictive analytics and data-driven insights in logistics operations can hinder the ability to make informed decisions.
2. Inefficient document tracking can lead to delays, missing important information, and difficulties in meeting regulatory requirements.
3. Conducting manual audit tasks can hinder compliance initiatives, consume excessive time, and are susceptible to errors.
4. Insufficient understanding of logistical procedures can make it difficult to identify and promptly address issues.
5. Resources and items are being lost during deliveries.

Through the resolution of these issues, the Hotel and Restaurant Management System project will assist lodging facilities and eateries in lowering expenses, increasing compliance, and making data-driven decisions.

1.4. Objectives and Goals

Development and enhancement are the utmost goals and objectives of this project. The researchers aim to reduce manual errors, improve efficiency, and implement predictive models for the overall field of logistics under hotel and restaurant management. The following are the specific goals and objectives under the modules that we will deep dive into.

Procurement

Goals:

- Aims to reduce operational cycle times and costs.
- To detect and inquire about better services and negotiation from vendors.
- Automating order purchases based on customer demands.

Objectives:

- Seamless delivery of supplies to maintain stock levels.
- Streamline the procurement of goods and services.

Vendor Portal

Goals:

- Aims to improve transparency between the vendor and the operations team.
- Developing an avenue centralized for monitoring in-house deliveries.
- Improve calibration between the hotel and restaurant management suppliers.

Objectives:

- Provide interface and facilitate smoother transactions for both parties.

Audit Management

Goals:

- Deepen accountability using accurate audit records.
- Improve rating under the Department of Foreign Affairs standards.

Objectives:

- Making sure that the system will follow regulatory compliance to avoid confusion and risks of mismanagement.

Document Tracking

Goals:

- Mitigate delays due to misplaced or loss of outdated documents.

- Shared avenue for accessing documents and updates.

Objective:

- Ensuring that all the documents are fully updated, secured, and can be available & easily accessed by the designated management team.

1.5 Significance and Relevance

In today's fast-paced hospitality industry, a comprehensive Hotel and Restaurant Management System (HRMS) equipped with advanced logistics and predictive analytics capabilities can be a real game-changer. This HRMS project will be fully helping the Paradise Hotel and other hotel and restaurant businesses to include logistics as one of their tools for gaining efficiency and having seamless transactions. Integrating procurement, vendor portal, audit management, and document tracking on one platform, will cater to knotty issues of hotel and restaurant management while offering the advantage of predictive insights. The Philippines Statistics Authority (PSA) reports that the hotel and restaurant sector contributes about 13% to the country's total services sector output. In addition to that, according to Frost & Sullivan, businesses in the ASEAN

region adopted automation solutions reported. 30-40% improvement in process efficiency. The system that the researchers implemented is highly important and relevant especially here in the Philippines. The system unlocks better vendor transactions, service quality, operational cost savings, and all in all business success not just for the current state but for future endeavors as well.

1.6 Structure of The Document

This document structure serves as an extensive guide for developing the HRMS. This document includes the Introduction, found in Chapter 1, which lays out the framework for the research by outlining the study's history, problem statement, general and research objectives, research questions or hypotheses, the significance of the study, boundaries, and scope, and definitions of important terms. This chapter describes the purpose of the study, its goals, and its possible outcomes. The Review of Related Literature, which includes Chapter 2, summarizes previous research on the subject, points out any gaps, and places the study in the perspective of earlier conclusions. Key ideas, models, and frameworks supporting the study are discussed thematically, and it might end with a theoretical or conceptual framework to direct the investigation. The research methodology, which is covered in Chapter 3, describes the

steps taken to carry out the investigation. It offers a concise description of the methodology that will be used to accomplish the goals and respond to the research questions presented in Chapter 1.

Chapter 2

2.1 Overview of the Agile Scrum Methodology

Agile Scrum is a popular methodology for project management that enables teams to produce high-quality work in a cooperative, gradual, and iterative way. It is especially well-liked in the software development industry, but it may be used in any industry where dynamic adaptability is necessary. The Agile Scrum for this project, Hotel, and Restaurant Management System: Logistics 2 (Procurement, Vendor Portal, Audit Management, Document Tracking) with Predictive Analytics using PHP-ML can give an effective structure for planning, implementation and delivery of the project.

Prioritizing customer satisfaction through continuous delivery of useful, functional features is the fundamental principle of Scrum. The key principles of the agile scrum process are embracing change, delivering functional products often, encouraging cooperation between the development and business teams, and ensuring customer satisfaction through early and continuous delivery. It prioritizes simplicity, constant progress, and self-organizing teams. Scrum is based on a set of basic values that include respect for one another, openness to criticism and new ideas, courage to face obstacles, and a dedication to achieving high-value work.

Software development projects frequently employ agile scrum to guarantee adaptation, flexibility, and customer-centric delivery. The project is divided into sprints under Scrum, which are brief iterative cycles of two to four weeks. Delivering a manageable, usable software increment—often referred to as a possibly shippable product increment—is the main goal of each sprint. By incorporating stakeholder feedback after each sprint, the development team can continuously enhance the product thanks to this incremental approach.

The Scrum Master, the Product Owner, and the Development Team are the three main responsibilities that Scrum outlines and work together to ensure the successful completion of Agile projects. Every function has specific duties meant to promote a cooperative, effective, and flexible development process. In addition to making sure that the Scrum framework is adhered to, the Scrum Master serves as a coach and facilitator for the Scrum team. Product owners manage the backlog of products and make sure the team is working on the proper priorities. They oversee optimizing the value of the product on behalf of customers or stakeholders. In each sprint, the cross-functional Development Team of specialists oversees creating the new iteration of the product. They owe the sprint's success jointly and are self-organizing.

2.2 Enterprise Architecture Concepts

A strategic framework known as Enterprise Architecture (EA) assists companies in coordinating their technological infrastructure with their business goals. To support corporate processes and information systems entails the thorough study, design, planning, and implementation of structures. EA offers a comprehensive perspective of an organization's activities, assisting in the management and optimization of IT systems, resources, and business operations. Information architecture (managing data flow and utilization), application architecture (creating software systems), technology architecture (structuring IT infrastructure), and business architecture (defining procedures and goals) are important components. EA promotes flexibility and integration, which helps to lower costs, increase efficiency, and stimulate innovation.

Business strategy and IT infrastructure alignment is facilitated by enterprise architecture (EA), which is made up of several important frameworks and standards. A few notable frameworks are the Federal Enterprise Architecture Framework (FEAF), which was created specifically for U.S. federal agencies to improve performance and interoperability, the Zachman Framework, which offers an organized perspective on and definition of an enterprise, and the Open Group Architecture Framework (TOGAF), which offers a comprehensive approach to the design, planning,

implementation, and governance of enterprise architectures. The modeling language ArchiMate for visualizing architectures, the Business Process Model and Notation (BPMN) for business process management, and ITIL for IT service management are a few other prominent standards. When combined, these standards and frameworks assist firms in increasing productivity, strengthening flexibility, and guaranteeing improved governance.

A comprehensive understanding and alignment of an organization's resources and objectives are facilitated by the various essential domains that are included in enterprise architecture (EA). Operations are in line with strategic goals thanks to the definition of business processes, which specify how jobs and activities are organized to provide value. By supporting business processes and facilitating effective workflows and user involvement, software solutions are the main emphasis of application architecture. Accurate, easily available, and efficiently utilized information is the goal of data architecture, which includes the arrangement, administration, and application of data assets.

2.3 Micro Services Architecture

The micro services architecture provides a potential method for Hotel and Restaurant Management Systems, notably for Logistics 2 operations. Breaking down big systems into smaller, independent services can help organizations enhance scalability, resilience, and innovation. While there are hurdles to overcome, like complexity and distributed transactions, the potential benefits far outweigh the drawbacks in most circumstances. Organizations can successfully apply microservices architecture to improve the efficiency and effectiveness of their logistical operations by carefully analyzing the principles, benefits, and obstacles.

Principles of Micro services Architecture

- Decentralized Governance
- Bounded Contexts
- API-First Design
- Technology Agnostic

Benefits of Microservices Architecture

Scalability: Through independent scaling of individual microservices in response to demand, performance and resource usage can be enhanced.

Resilience: More availability and dependability are achieved when a single micro service fails rather than the system.

Agility: Faster development and deployment are made possible by the ability to modify individual micro services without affecting the system.

Innovation: By experimenting with various technologies and methods, various teams can promote the development of creativity and innovation.

Challenges of Micro services Architecture

Complexity: Coordinating and orchestrating numerous microservices can be difficult, requiring careful planning.

Distributed Transactions: It might be difficult to guarantee data consistency between several services, particularly when dealing with cross-border transactions.

Testing: Because micro services systems have more parts and interactions, testing them might be more difficult.

Debugging: Finding the core cause of an issue can be tough when it affects several services.

Researchers have suggested several approaches to deal with these problems. Clear communication boundaries between services can be established with the usage of API-first design, and coupling can be

minimized, and asynchronous communication can be facilitated via event-driven architectures. Furthermore, micro services system administration can be made simpler with the use of orchestration and service discovery technologies. Researchers have found difficulties with the architecture of microservices. Handling several services at once can be difficult and needs careful planning, arranging, and coordinating. It can be difficult to guarantee data consistency across distributed systems, especially when handling transactions that span several services.

2.4 Devops CI/CD

The use of DevOps and CI/CD in Hotel and Restaurant Management Systems can have a big impact. These approaches are fundamental to contemporary software development. Organizations can increase customer happiness, increase efficiency, and streamline operations by utilizing DevOps and CI/CD.

By implementing DevOps and CI/CD practices these are the specific benefits for Hotel and Restaurant Management Systems:

Optimized Inventory Management: Automated procedures can cut down on waste and increase inventory accuracy.

Improved Customer Experience: Adding new features more quickly can result in happier customers.

Enhanced Operational Efficiency: Staff members can concentrate on other duties while automated tasks take up their time.

Lower Risk: Automated monitoring and testing can assist in locating and resolving possible problems.

DevOps and CI/CD are crucial components of contemporary Hotel and Restaurant Management Systems, allowing businesses to raise customer happiness, quality, and efficiency.

2.5 Integration of Information Systems in Enterprise

Environments

To increase productivity, streamline operations, and improve client experiences, restaurant businesses must integrate information technology.

2.6 Related Literatures

The value of linked literature for a Hotel and Restaurant Management System (HRMS) focusing on Logistics 2 (Procurement, Vendor Portal, Audit Management, Document Tracking) with Predictive Analytics using PHP-ML resides in providing a basic framework for system development. By providing insights into current systems, highlighting effective methods for automating vendor management and procurement procedures, and resolving issues with audit management and document tracking, it contributes to the design process. Developers may efficiently incorporate predictive analytics, optimizing demand forecasting and decision-making with PHP-ML by analyzing relevant research. Literature also encourages innovation and ongoing system upgrades by ensuring adherence to industry standards. We input 25 literature sources for better calibration of the goal and framework of this project.

Agile Scrum Methodology Overview

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Enterprise Architecture Concepts

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These 25 literature sources, spanning Agile Scrum methodology, enterprise architecture, relevant studies, and information system integration within higher education, provide a solid foundation for the completion of the researcher's hotel and restaurant management system project. They inform our approach, align us with industry's best practices, and help us address the evolving needs of higher education institutions.

Chapter 3

3.1 Agile Scrum Methodology in the Project

We employ an agile scrum technique to carry out the system development, breaking down big projects into smaller ones known as sprints. To build and visualize the evolution of the system, we also have sprint and product backlogs that contain user stories. The group consists of five people, each of whom has specific duties to complete the task at hand or meet the standards necessary for the development of the system.

3.2 Scrum Board

TO DO	IN PROGRESS	DONE
Integrate Analytics Table	Review and validate the system's quality and integration	Set up user log in and registration system
Fully furnish the entire system including its features.	Input functions for the subsystems of each module	Implement Security such as SSL, Data Encryption, Authentication & Authorization, and Input Validation
Input functions for the remaining static subsystems.	Completion of details for the subsystems	Created unified and well-designed UI

Application of PHP-ML	Functional Testing	Develop two factor authentication
Present the system to the client	Handling transaction errors and timeouts.	Password recovery system
Integration to finance system	Full integration to Restful API	Dynamic Charts

Table 1

3.3 Product Backlog

PROCUREMENT			
User Story No.	User Stories	User Story Priority	Status
1	As a manager, I can submit a purchase requisition to request items.	1	In Progress
2	As a manager, I can generate budget approval request.	2	In Progress

3	As a manager, I can access the approved requisition purchase orders.	3	In Progress
4	As a manager, I can send RFQs to vendors to obtain pricing for requested items.	4	In Progress
5	As a manager, I can view and manage contracts with selected vendors.	6	In Progress
6	As a manager, I can access generated invoices based on the purchase order.	8	In Progress
7	As a supplier, I can receive RFQs from the manager.	5	In Progress

8	As a supplier, I can manage contracts with the hotel's manager.	7	In Progress
9	As a supplier, I can submit invoices linked to delivered purchase orders.	9	In Progress
10	As an admin, I can view invoices generated from the transactions.	10	In Progress

Table 2

VENDOR PORTAL			
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User Story Numbers	User Stories	User Story Priority	Status
11	As a vendor, I can have a centralized view of all the interactions with the hotel's team.	1	In Progress
12	As a manager, I can have a centralized view of all the interactions with the vendors.	2	In Progress
13	As a vendor, I can view and manage POs sent by the hotel.	3	In Progress
14	As a manager, I can view and manage POs for the vendors.	4	In Progress
15	As a vendor, I can receive RFQs from the hotel team when there is a need to procure certain goods.	5	In Progress
16	As a manager, I can generate RFQs for the vendors when there is a need to procure certain goods.	6	In Progress

17	As a vendor, I can maintain and update a catalog of products we offer to the hotel.	7	In Progress
18	As a manager, I can view product catalogs from the vendor.	8	In Progress
19	As a vendor, I can manage contracts with the hotel's manager.	9	In Progress
20	As a manager, I can view and manage contracts with the vendors.	10	In Progress
21	As a vendor, I can submit invoices linked to delivered POs and can track the payment status.	11	In Progress
22	As a manager, I can view invoices submitted from the vendor.	12	In Progress
23	As a vendor, I can provide real-time updates on the delivery status of ordered goods.	13	In Progress
24	As a manager, I can check updates for the ordered goods from the vendor.	14	In Progress

25	As a vendor, I can view our performance ratings based on criteria such as delivery timeliness, product quality, and responsiveness.	15	In Progress
26	As a manager, I can update the ratings of the vendor.	16	In Progress
27	As a vendor, I can access help or support regarding our interactions with the hotel's team.	17	In Progress
28	As a manager, I can assist the vendors if they need help & support.	18	In Progress

Table 3

AUDIT MANAGEMENT			
User Story Numbers	User Stories	User Story Priority	Status
29	As an auditor, I can schedule my audits.	1	In Progress
30	As an associate, I can view scheduled audits.	2	In Progress
31	As an auditor, I can log my audits.	4	In Progress
32	As an auditor, I can filter my audit logs based on severity or status.	5	In Progress
33	As an admin, I can view scheduled audits.	3	In Progress
34	As an auditor, I can access and modify audit findings.	6	In Progress
35	As an associate, I can view audit findings.	7	In Progress

36	As an auditor, I can access audit history.	8	In Progress
37	As an associate, I can view audit history.	9	In Progress
38	As an auditor, I can access reports.	10	In Progress
39	As an associate, I can access reports.	11	In Progress
40	As an admin, I can access reports.	12	In Progress

Table 4

DOCUMENT TRACKING			
User Story Numbers	User Stories	User Story Priority	Status
41	As a document associate, I can access & modify the document list.	1	In Progress
42	As a document associate, I can access & modify the document content section.	3	In Progress
43	As a document associate, I can access & modify the document history.	4	In Progress
44	As a document associate, I can access & modify the document search and filtering.	5	In Progress
45	As a manager, I can access a document list.	2	In Progress

46	As a manager, I can access document search and filtering.	6	In Progress
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Table 5

FOOD & BEVERAGE MANAGEMENT			
User Story Numbers	User Stories	User Story Priority	Status
47	As a restaurant manager, I can create, update, and manage menus.	1	In Progress
48	As a manager, I can access the menu management.	2	In Progress
49	As a restaurant manager, I can coordinate between in-room orders and hotel staff.	3	In Progress
50	As a manager, I can coordinate between in-room orders and kitchen staff.	4	In Progress

51	As a restaurant manager, I can monitor food and beverage stock levels in real-time.	5	In Progress
52	As a manager, I can monitor food and beverage stock levels in real-time.	6	In Progress
53	As a restaurant manager, I can organize and store recipes.	7	In Progress
54	As a manager, I can access recipe management.	8	In Progress
55	As a restaurant manager, I can calculate food costs for each menu item.	9	In Progress
56	As a manager, I can access food costing.	10	In Progress

57	As a restaurant manager, I can track food waste.	11	In Progress
58	As a manager, I can access food waste management.	12	In Progress
59	As a restaurant manager, I can generate detailed reports on food costs, stock usage, kitchen performance, and waste management to aid decision-making.	13	In Progress
60	As a manager, I can access reports and analytics.	14	In Progress

Table 6

3.4 SPRINT BACKLOG

SPRINT 1				
User Story No.	User Stories	Task	Points	Responsible Team Members
1	As a manager, I can submit a purchase requisition to request items.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
2	As a manager, I can generate budget approval request.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
3	As a manager, I can access the approved requisition purchase orders.	Design UI, Develop,	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi,

		Testing, Training		Asmin Boga, Elaisa Arca
4	As a manager, I can send RFQs to vendors to obtain pricing for requested items.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
5	As a manager, I can view and manage contracts with selected vendors.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 7

SPRINT 2				
User Story No.	User Stories	Task	Points	Responsible Team Members
6	As a manager, I can access generated invoices based on the purchase order.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
7	As a supplier, I can receive RFQs from the manager.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
8	As a supplier, I can manage contracts with the hotel's manager.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
9	As a supplier, I can submit invoices linked	Design UI, Develop,	8 hours	Kier Salise, Sheila Velasco, Mheera Ann

	to delivered purchase orders.	Testing, Training		Valerie Conwi, Asmin Boga, Elaisa Arca
10	As an admin, I can view generated invoices from the transactions.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 8

SPRINT 3				
User Story No.	User Stories	Task	Points	Responsible Team Members
11	As a vendor, I can have a centralized view of all the interactions with the hotel's team.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
12	As a manager, I can have a centralized view of all the interactions with the vendors.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
13	As a vendor, I can view and manage POs sent by the hotel.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
14	As a manager, I can view and manage POs for the vendors.	Design UI, Develop,	8 hours	Kier Salise, Sheila Velasco, Mheera Ann

		Testing, Training		Valerie Conwi, Asmin Boga, Elaisa Arca
15	As a vendor, I can receive RFQs from the hotel team when there is a need to procure certain goods.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 9

SPRINT 4				
User Story No.	User Stories	Task	Points	Responsible Team Members
16	As a manager, I can generate RFQs for the vendors when there is a need to procure certain goods.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
17	As a vendor, I can maintain and update a catalog of products we offer to the hotel.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
18	As a manager, I can view product catalogs from the vendor.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

19	As a vendor, I can manage contracts with the hotel's manager.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
20	As a manager, I can view and manage contracts with the vendors.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 10

SPRINT				
5				
User Story No.	User Stories	Task	Points	Responsible Team Members
21	As a vendor, I can submit invoices linked to delivered POs and can track the payment status.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
22	As a manager, I can view submitted invoices from the vendor.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
23	As a vendor, I can provide real-time updates on the delivery status of ordered goods.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

24	As a manager, I can check updates for the ordered goods from the vendor.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
25	As a vendor, I can view our performance ratings based on criteria such as delivery timeliness, product quality, and responsiveness.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 11

SPRINT				
6				
User Story No.	User Stories	Task	Points	Responsible Team Members
26	As a manager, I can update the ratings of the vendor.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
27	As a vendor, I can access help or support regarding our interactions with the hotel's team.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
28	As a manager, I can assist the vendors if they need help & support.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

29	As an auditor, I can schedule my audits.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
30	As an associate, I can view scheduled audits.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 12

SPRINT 7				
User Story No.	User Stories	Task	Points	Responsible Team Members
31	As an auditor, I can log my audits.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
32	As an auditor, I can filter my audit logs based on severity or status.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
33	As an admin, I can view scheduled audits.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
34	As an auditor, I can access and modify audit findings.	Design UI, Develop,	8 hours	Kier Salise, Sheila Velasco, Mheera Ann

		Testing, Training		Valerie Conwi, Asmin Boga, Elaisa Arca
35	As an associate, I can view audit findings.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 13

SPRINT 8				
User Story No.	User Stories	Task	Points	Responsible Team Members
36	As an auditor, I can access audit history.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
37	As an associate, I can view audit history.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
38	As an auditor, I can access reports.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
39	As an associate, I can access reports.	Design UI, Develop,	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

		Testing, Training		
40	As an admin, I can access reports.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 14

SPRINT				
9				
User Story No.	User Stories	Task	Points	Responsible Team Members
41	As a document associate, I can access & modify the document list.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
42	As a document associate, I can access & modify the document content section.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
43	As a document associate, I can access & modify the document history.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

44	As a document associate, I can access & modify the document search and filtering.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
45	As a manager, I can access a document list.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 15

SPRINT 10				
User Story No.	User Stories	Task	Points	Responsible Team Members
46	As a manager, I can access document search and filtering.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
47	As a restaurant manager, I can create, update, and manage menus.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
48	As a manager, I can access the menu management.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
49	As a restaurant manager, I can coordinate between in-	Design UI, Develop,	8 hours	Kier Salise, Sheila Velasco, Mheera Ann

	room orders and hotel staff.	Testing, Training		Valerie Conwi, Asmin Boga, Elaisa Arca
50	As a manager, I can coordinate between in-room orders and kitchen staff.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 16

SPRINT 11				
User Story No.	User Stories	Task	Points	Responsible Team Members
51	As a restaurant manager, I can monitor food and beverage stock levels in real-time.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
52	As a manager, I can monitor food and beverage stock levels in real-time.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
53	As a restaurant manager, I can organize and store recipes.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
54	As a manager, I can access recipe management.	Design UI, Develop,	8 hours	Kier Salise, Sheila Velasco, Mheera Ann

		Testing, Training		Valerie Conwi, Asmin Boga, Elaisa Arca
55	As a restaurant manager, I can calculate food costs for each menu item.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 17

SPRINT 12				
User Story No.	User Stories	Task	Points	Responsible Team Members
56	As a manager, I can access food costing.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
57	As a restaurant manager, I can track food waste.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
58	As a manager, I can access food waste management.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

59	As a restaurant manager, I can generate detailed reports on food costs, stock usage, kitchen performance, and waste management to aid decision-making.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca
60	As a manager, I can access reports and analytics.	Design UI, Develop, Testing, Training	8 hours	Kier Salise, Sheila Velasco, Mheera Ann Valerie Conwi, Asmin Boga, Elaisa Arca

Table 18

3.5 Roles and Responsibilities

The table below shows the key roles of each of the members who took part in this capstone project.

Name	Role	Responsibilities
Kier Salise	Project Manager / Lead Programmer	Monitor and control any changes to the scope through formal change requests and develop the whole system.
Sheila Velasco	Assistant Programmer	Collaborate with the Project Manager to identify and assess change requests and assists in developing the system.
Mheera Ann Valerie Conwi	Document Specialist	Contribute to the formulation of change resolutions of the project documents.
Elaisa Grace Arca	Network Administrator	Contribute to the formulation of change resolutions in terms of the network flow.

Asmin Boga	Security Analyst	Evaluating the needs for security implementation and modification.
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Table 19

3.6 Microservices Architecture

A microservices architecture for a hotel and restaurant management system that is focused on logistics involves dividing the system into independent services, each responsible for specific functionalities like procurement services, vendor portal services, audit management services, document tracking and food and beverage management. Each microservice can communicate through APIs, enabling seamless interaction between services in each of it. This architecture offers scalability, as services can be developed, deployed, and maintained independently. It also supports improved resilience and fault isolation, ensuring that an issue in one service (e.g., inventory) does not disrupt other subsystems involved

3.7 Microservices Diagram

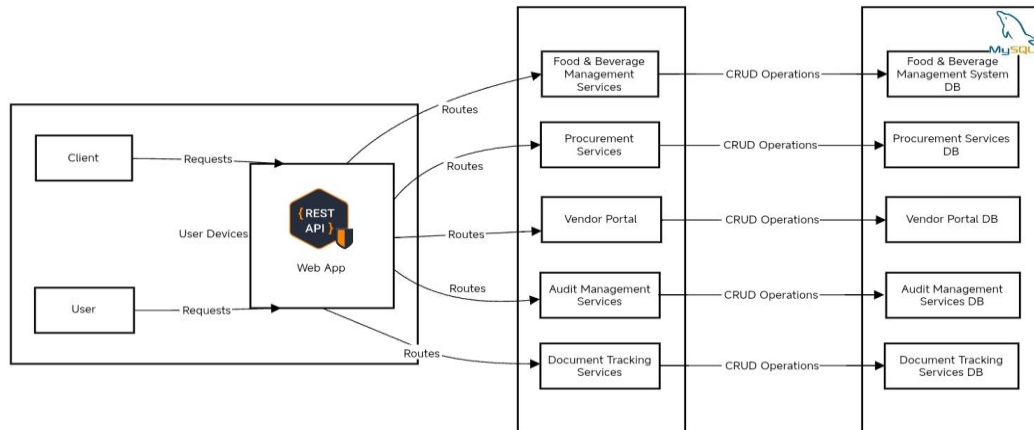


Figure 1

3.8 Communication Pattern

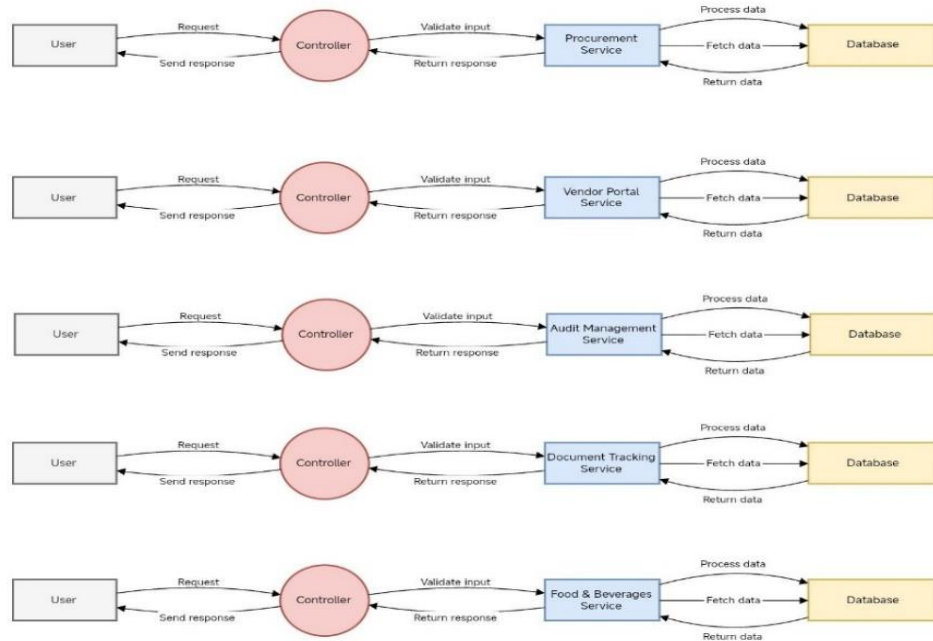


Figure 2

3.9 Data Flow Diagram

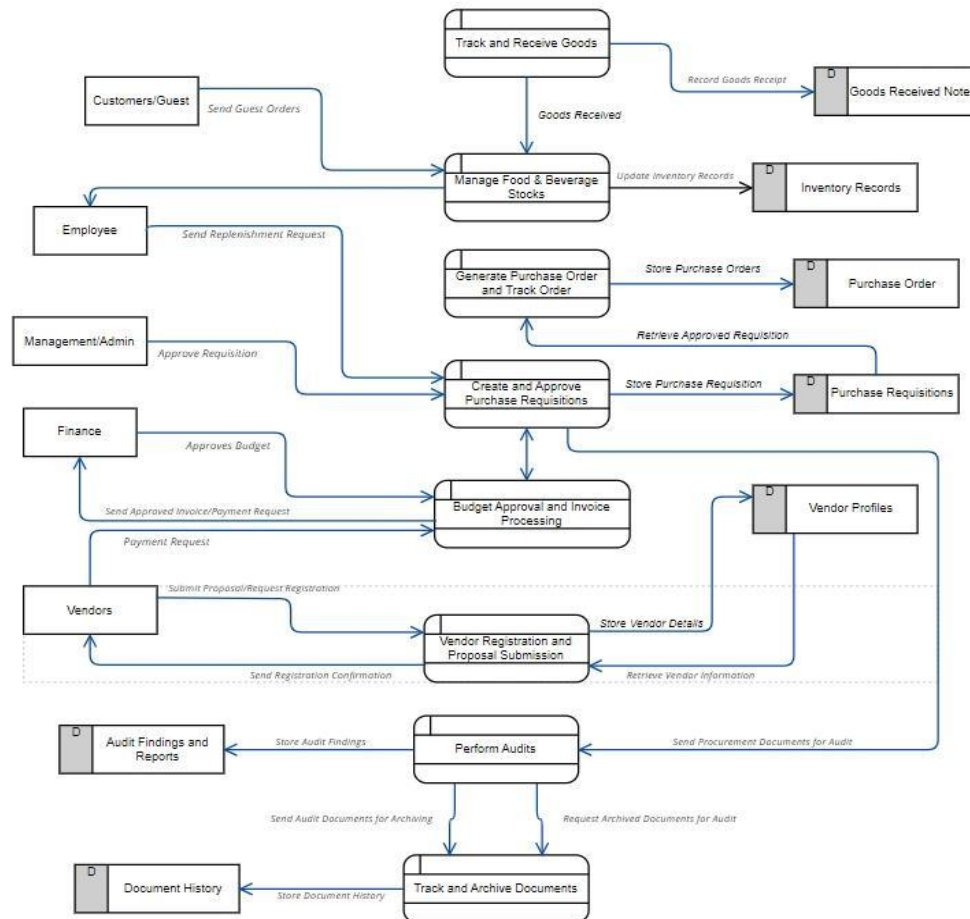


Figure 3

3.10 Devops Implementation

Fully integrating DevOps into a hotel or restaurant management system for logistics builds a solid, scalable, and effective platform that facilitates seamless customer experiences, operational transparency, and continuous service delivery. Through the utilization of automation, collaboration, and standardization of infrastructure, hotels and restaurants may enhance their logistics management, optimize their supply chains, and promptly respond to restaurant demands.

3.11 CI / CD Pipeline

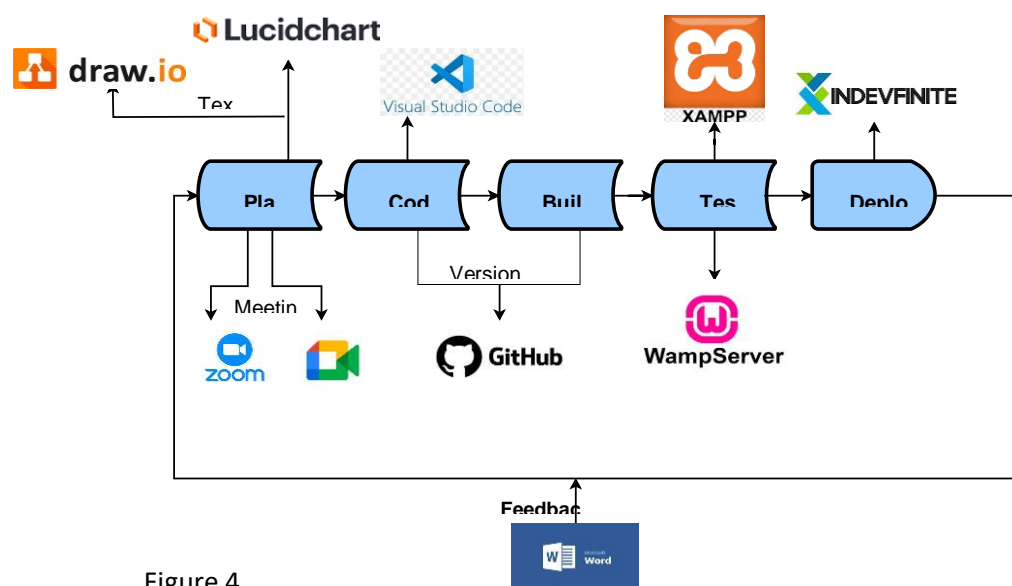


Figure 4

3.12 Infrastructure as Code

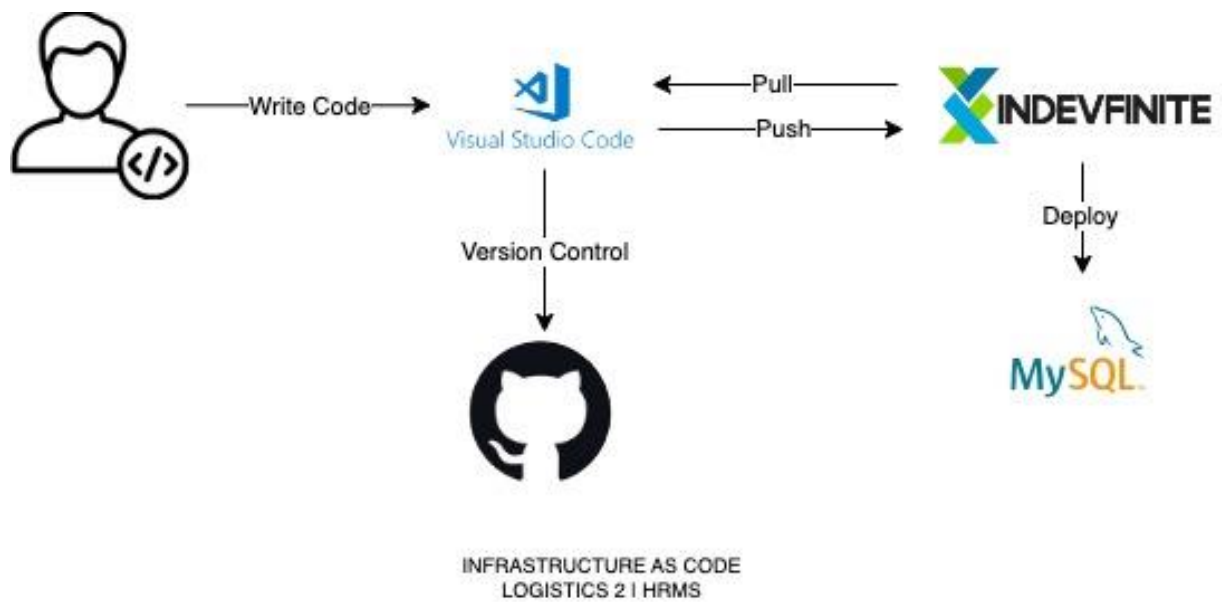


Figure 5

3.13 Integration

3.15 Business Process Architecture Level 2

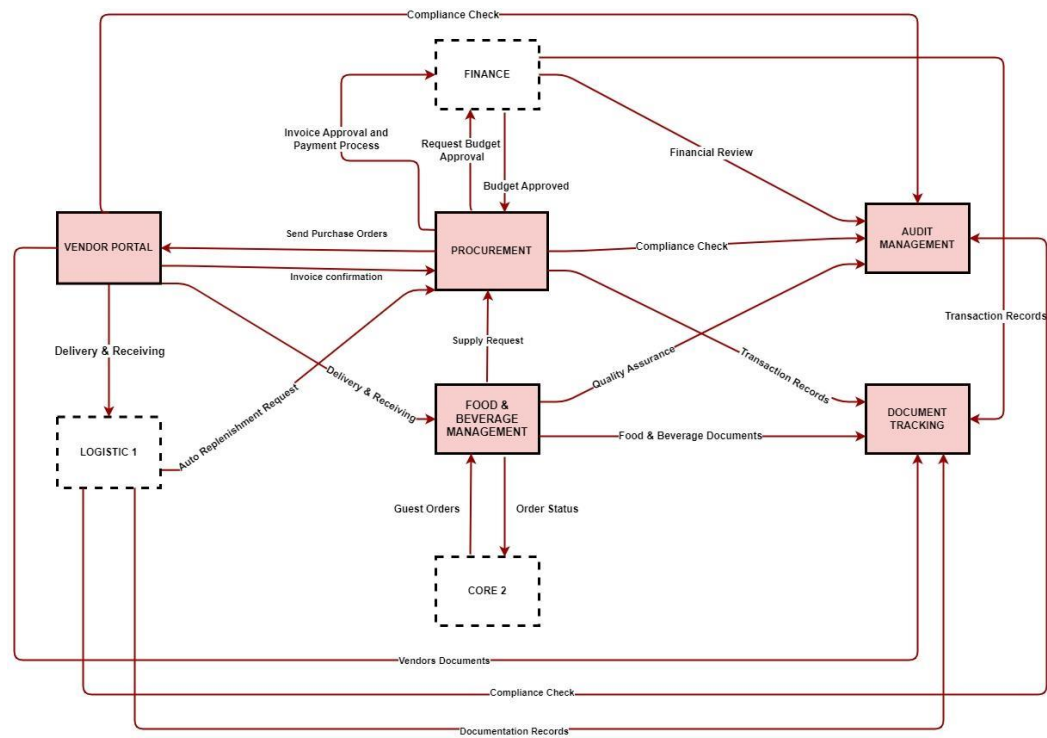


Figure 7

3.16 API Gateway

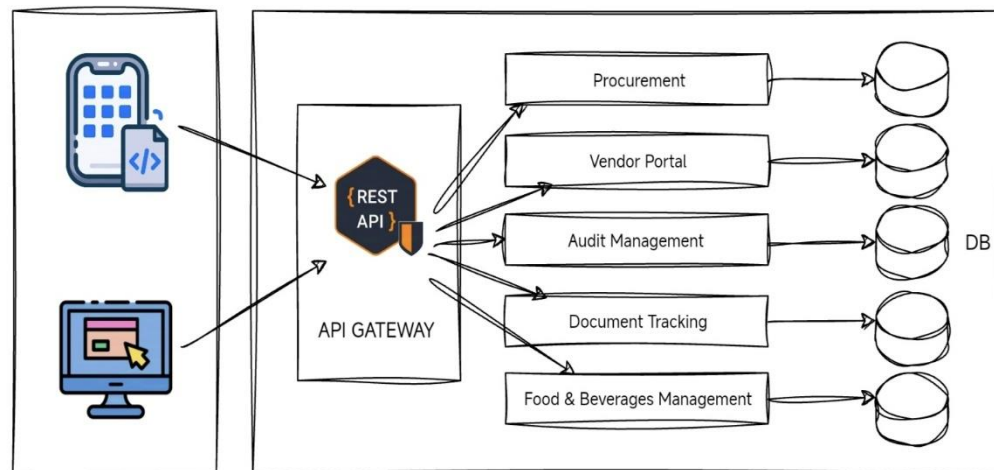


Figure 8

3.17 Additional Considerations

Here are the additional considerations to investigate to make sure that the proposed system meets its goals.

3.18 Use-Case Diagram

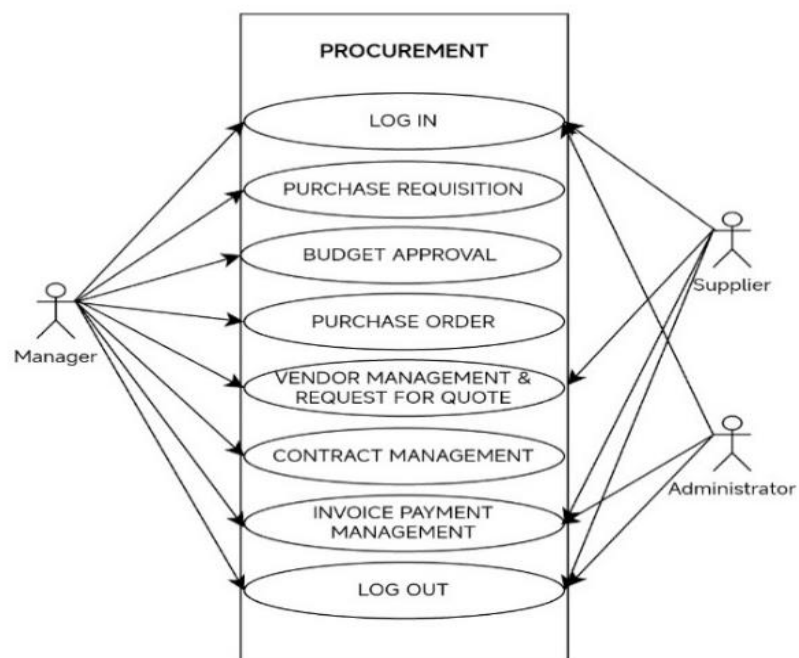


Figure 9

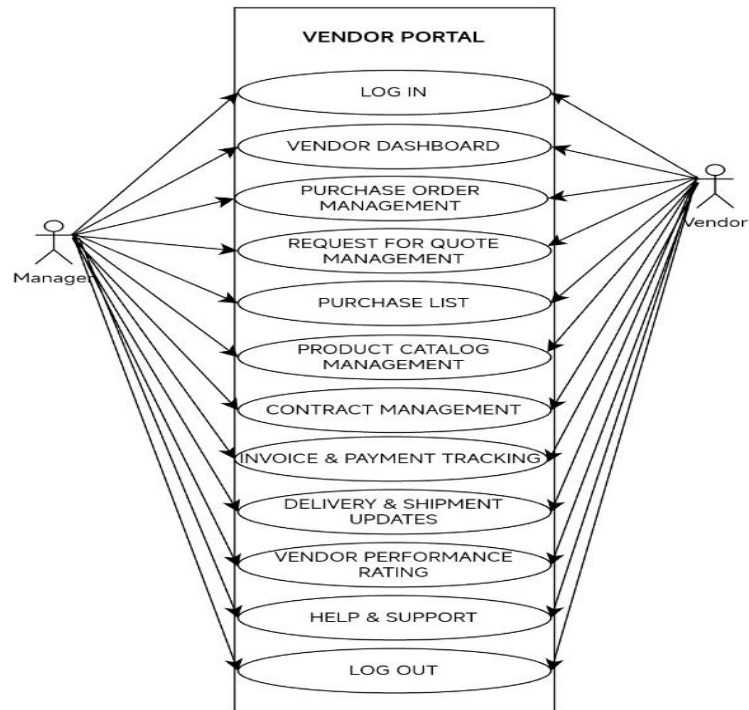


Figure 10

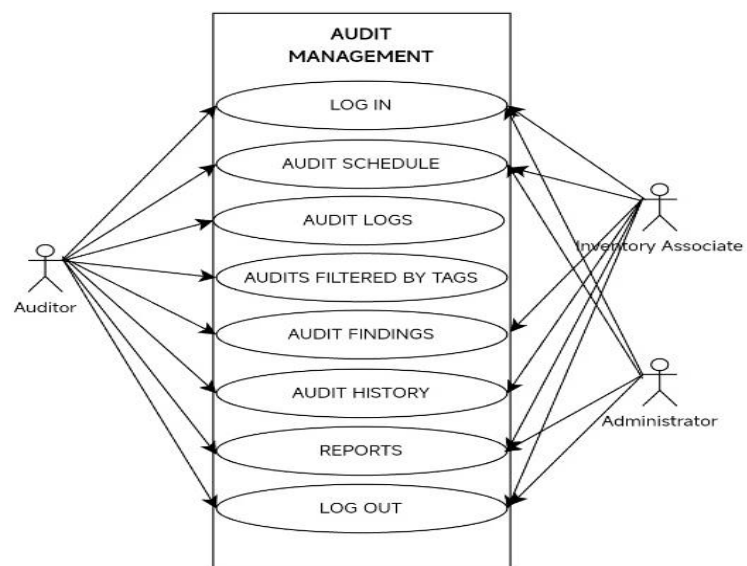


Figure 11

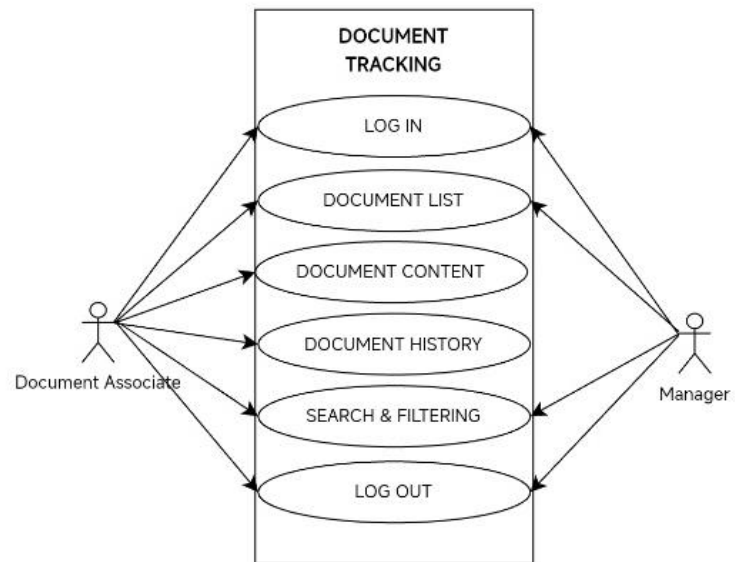


Figure 12

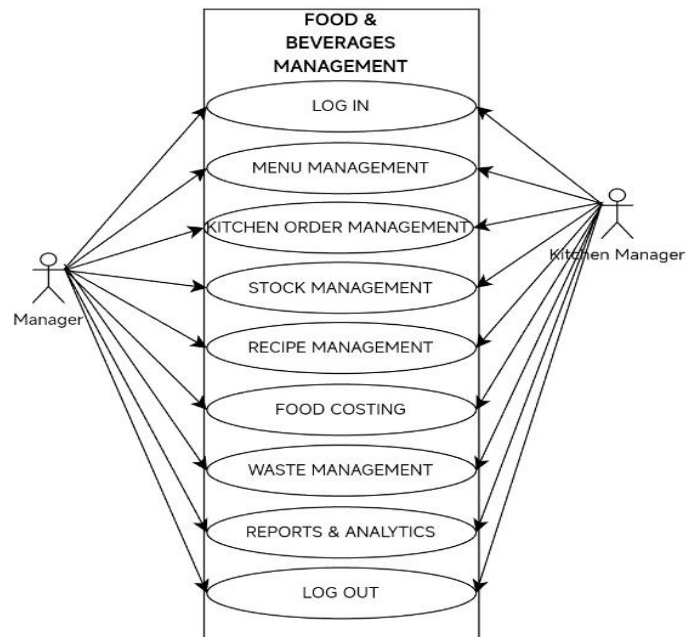


Figure 13

3.19 Sequence Diagram

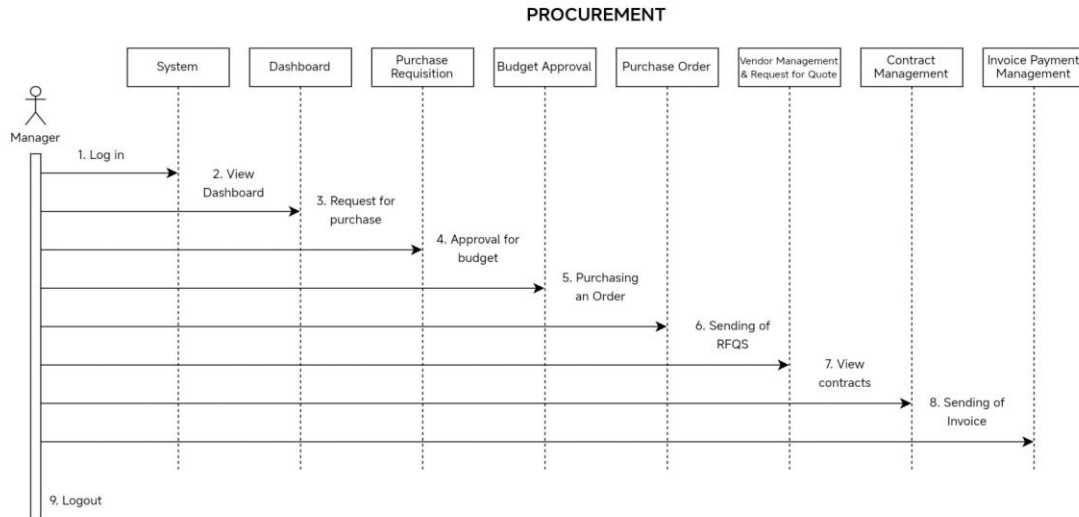


Figure 14

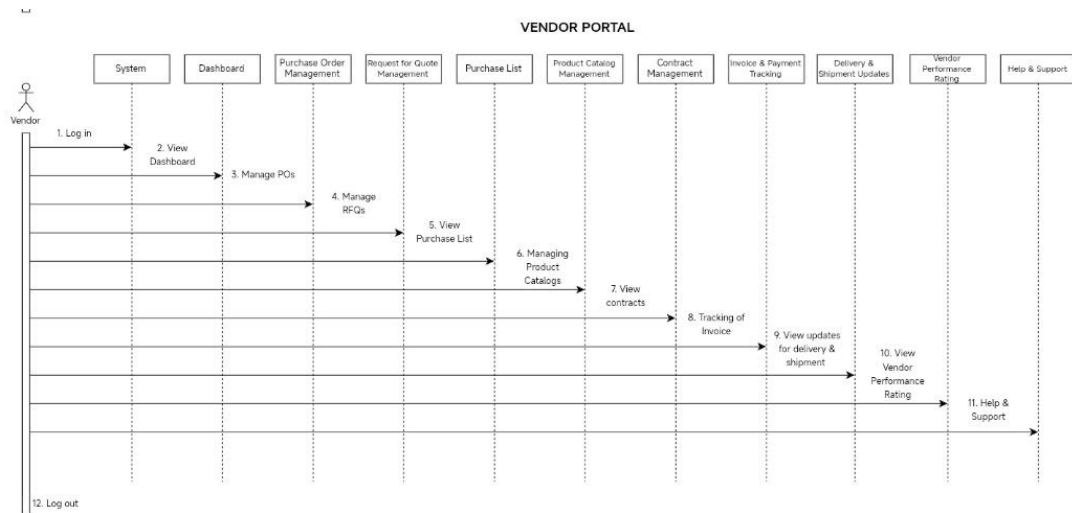


Figure 15

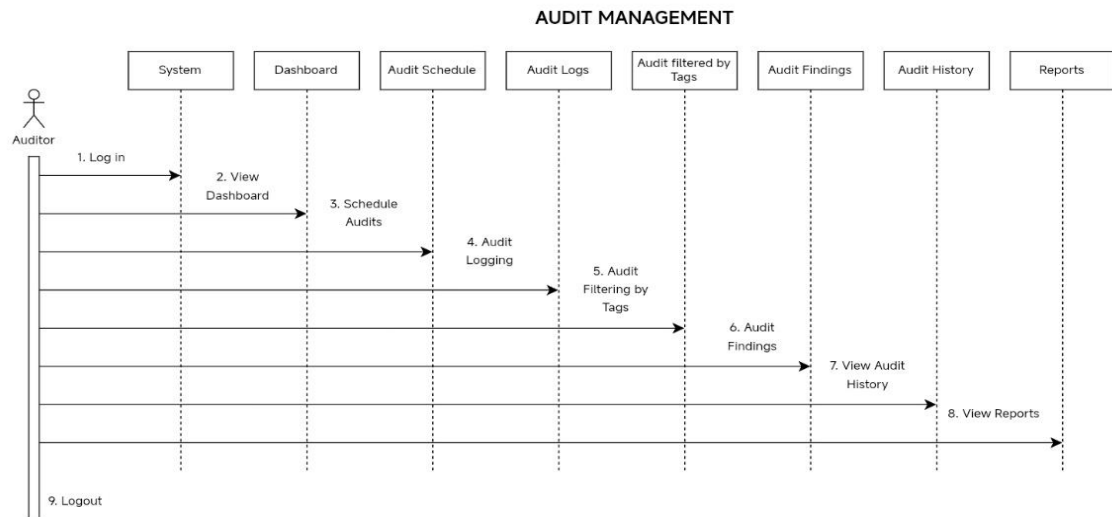


Figure 16

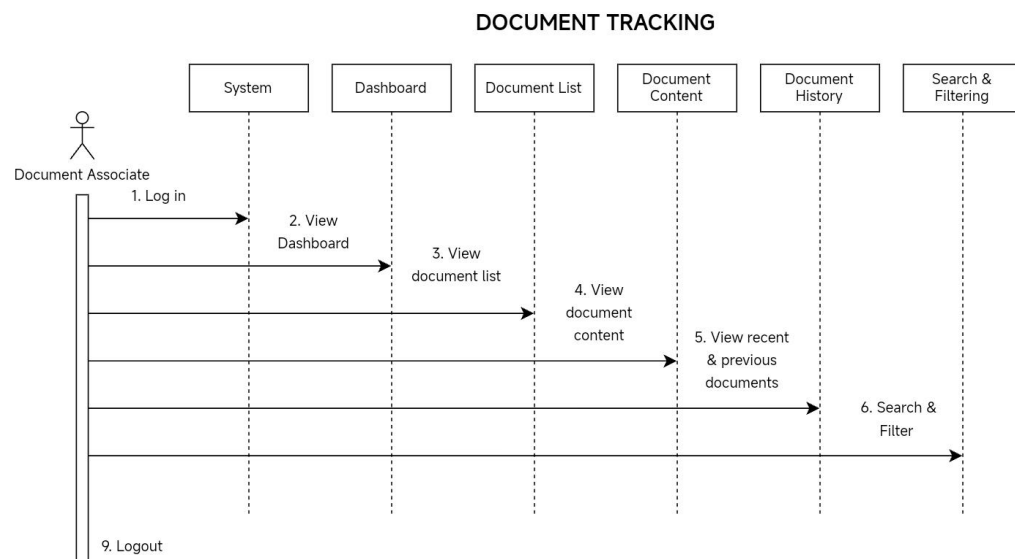


Figure 17

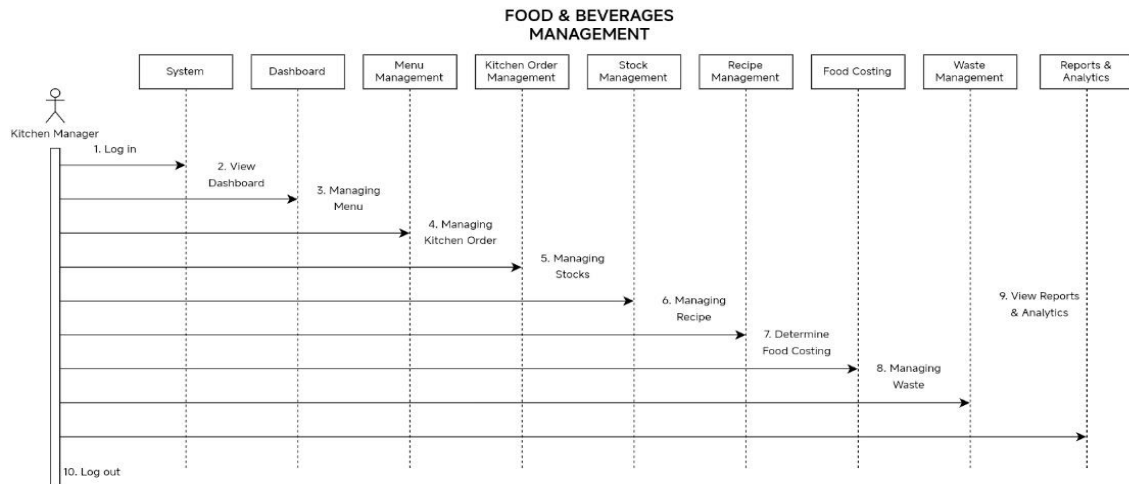


Figure 18

3.20 Agile Diagram and Network Architecture

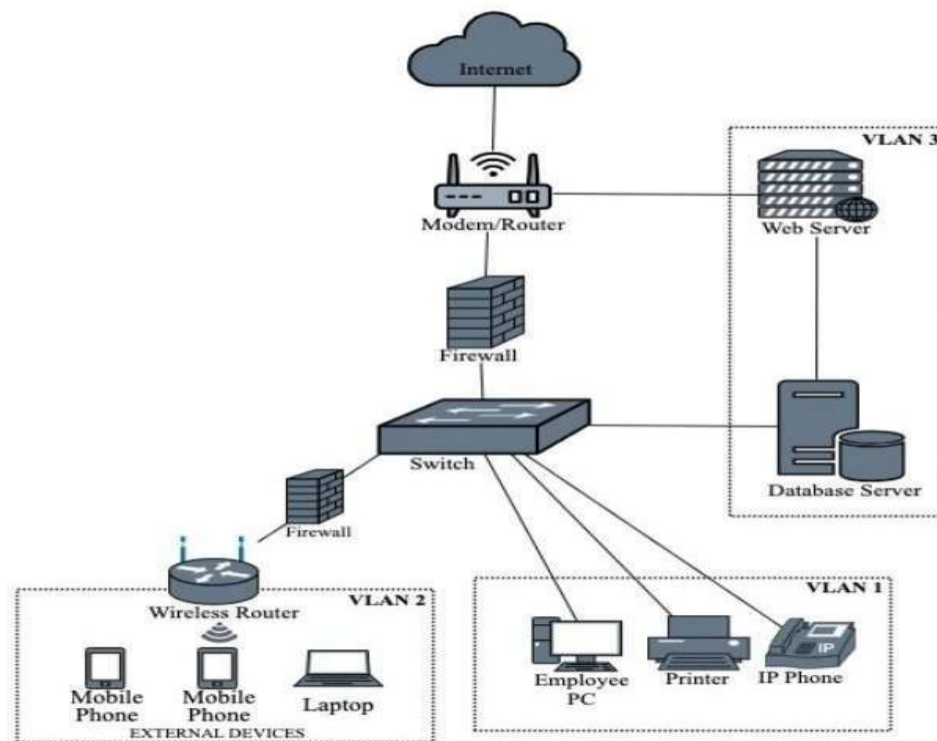


Figure 19