SLIIT CITY UNI

Project Proposal Report

Retail Rover – POS Management System

Maven Technology Solutions – Group WD_11

MAVENTEK

Ganesha The Food Store

Version

21/02/2024

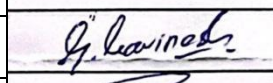
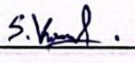
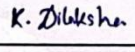
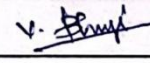
This proposal is submitted to the Information Technology department in partial fulfillment for the PPA module in the Diploma in Information Technology program.

DECLARATION

We hereby declare that the project work entitled “Retail Rover”, submitted to the SLIIT City Uni (Pvt.) Ltd. a subsidiary of Sri Lanka Institute of Information Technology is a record of an original work done by us, under the guidance of our Supervisor “Minul Hettiarachchi”. This project work is submitted in the partial fulfillment of the requirement for the award of the Diploma in Information Technology. The Results embodied in this report have not been submitted to any other University or Institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

Project ID:

Group Members:

Student ID	**Student Name**	**Signature**
SA22446626	**G Kavinesh**	
SA22493606	**P Manav Pranavin**	
SA22494078	**S Vickash**	
SA22448088	**K Diluksha**	
SA22447098	**V Thujithra**	

Date of Submission: 27/02/2024

Supervisor	Client
Name : Minul Hettiarachchi	Name : Hariprashanth Chandrakumar
Signature : 	Signature : 

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1 INTRODUCTION

Ganesha the Food Store is a well-liked mini-supermarket that has been providing our residents with food and groceries for a while and is located in the center of our community. Businesses must improve their operational effectiveness and customer experience as technology develops and consumer expectations change. Taking this into consideration, we offer a plan to update and improve Ganesha the Food Store's Point of Sale (POS) system so that it not only satisfies modern requirements but also looks ahead to the needs of the company and its devoted clientele.

This proposal emphasizes the necessity of a strategic upgrade, the problems that the current system is facing, and the significance of the suggested changes for both operational effectiveness and customer satisfaction. The chapter preview promises to explore particular problems with the existing point of sale system, highlight the importance of the suggested improvements, and provide a thorough rundown of the suggested fix that is in line with the store's dedication to quality.

1.1 BACKGROUND OF THE CLIENT/ PROJECT

The good name of our client is **Hariprashanth Chandrakumar**. He has been making use of this software since he open his supermarket a couple of years ago. Moreover ,The project is an own idea and proposal of our team. We visited our client to review the software and the purpose of the software solely is to perform on spot transactions for daily buyers and visitors to the shop. Including other features such as maintaining reports , managing staff , managing stock inventory etc;

1.2 PROBLEM STATEMENT

The software is currently functioning well but faces operational challenges with its outdated POS system. The existing system, implemented years ago , struggles to cope up with the current retailer demands, resulting in extended checkout times , occasional errors and limited functionality. We have come up with our team’s own dedicated solution towards these obstacles which will improve the efficiency of the checkout process and make things more faster and more pleasant for the customer when purchasing products

1.3 NEEDS STATEMENT

To improve staff and customer satisfaction and operational efficiency, the current point-of-sale system needs to be upgraded. To enable electronic bill payments, the system must specifically incorporate eBill features, which will expedite transactions and increase convenience and speed. Furthermore, during product billing processes, a feature enhancement that allows the selection of multiple prices for a single barcode through a selectable dropdown is desperately needed. This update will improve the system's pricing mechanisms' accuracy and flexibility in addition to streamlining transactional workflows.

1.4 SOLUTION AND OBJECTIVES

The proposed project encompasses a multifaceted upgrade to the Point of Sale (POS) system at Ganesha the Food Store. Firstly, the initiative involves a comprehensive analysis and upgrade of the existing POS software to its latest version, coupled with the implementation of a more intuitive and user-friendly interface. This solution aims to improve overall system performance, enhance the user experience for both customers and store staff, and ensure the POS system remains abreast of the latest features and security measures. Secondly, the project entails the integration of an electronic billing (eBill) functionality into the POS system, facilitating the generation of electronic invoices for all transactions. This addition seeks to streamline the billing process, reduce manual paperwork, enhance record-keeping, and provide customers with a digital invoice.

The project also takes care of the requirement for a dropdown menu that can be selected for multiple prices associated with a single barcode. The POS system will support various pricing structures by adding this functionality, giving managers flexibility in handling discounts, promotions, and fluctuating product prices. Incorporating a selectable dropdown during product billing is another attempt to reduce errors by making it simple to choose the accurate price, which will ultimately result in a more effective and error-free transaction process at Ganesha the Food Store.

2 PROPOSED TECHNICAL APPROACH

This section presents a thorough technical plan for integrating information technology into the suggested POS system upgrade. Our methodology includes requirements collection, architecture design, best practices for implementation, and project-specific quality assurance measures.

2.1 DEVELOPMENT METHODOLOGY

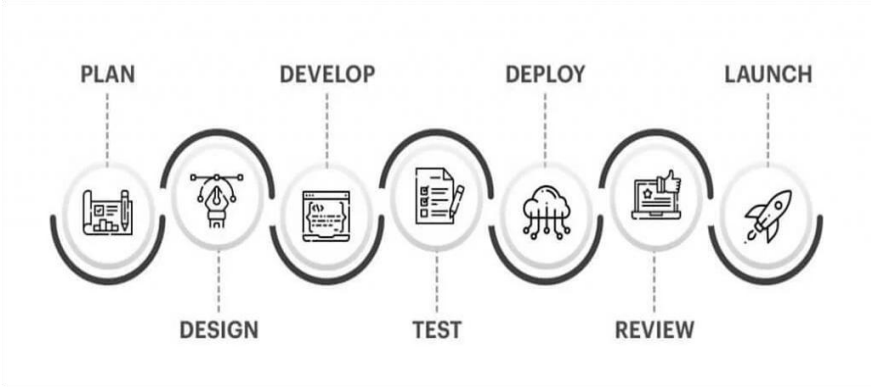


Figure 2.1.1: Agile methodology [1]

Due to the Agile methodology's built-in adaptability, flexibility, and iterative approach to software development, we have decided to use it for this project. The Agile methodology is a good fit for our POS system upgrade project for the following main reasons

- By dividing the project into manageable sprints, incremental development allows for ongoing feedback and improvement.
- Adaptability to Change: Accepts change as a necessary part of improvement and responds effectively to changing priorities and requirements.
- Customer Collaboration: In order to match user expectations and needs with the POS system, actively involves stakeholders.
- Delivering functional increments early and continuously is important for validating assumptions and reducing risks.

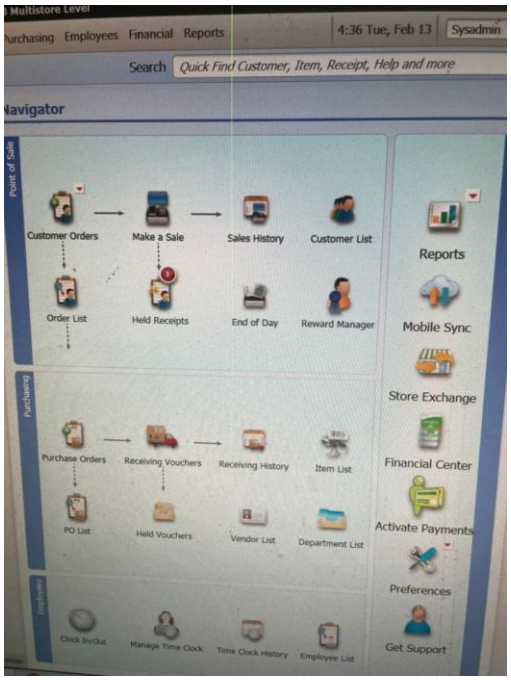
- Emphasis on Quality: Combines quality assurance and testing procedures to guarantee a solid and dependable point-of-sale system.
- Empowered Development Teams: Encourages individuality, responsibility, and inventiveness in team members to facilitate efficient problem-solving and creativity.
- To summarise, Agile methodology facilitates flexible response to changes, iterative delivery, efficient collaboration, quality assurance, and team success.

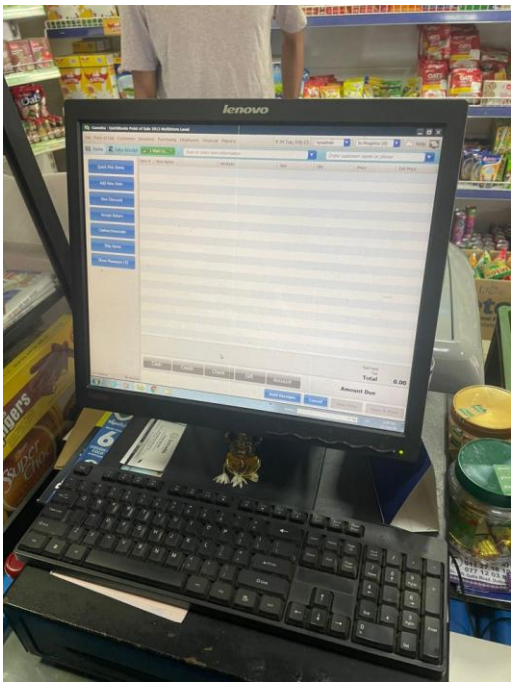
2.2 REQUIREMENT GATHERING

For the proposal, we gave priority to having in-person meetings at the client's shop in order to collect information about the project. This is a succinct overview:

- Client meetings: To better understand the needs, difficulties, and goals for the POS system upgrade, we had face-to-face conversations.
- On-Site Observations: During our visits, we watched the current system operate to pinpoint its main features and user interfaces.
- In-depth Talks: We were able to investigate transaction workflows, inventory management, and reporting requirements through talks with the client and their team.
- Requirement Gathering: We took proactive steps to gather comprehensive requirements, such as selectable pricing dropdowns and eBill features.
- Documentation and Images: Detailed visit notes and images supported precise client requirements capture by offering visual context

Attached here with is visual proof of our visit to interact :





2.3 ARCHITECTURE DIAGRAM

2.3.1 AS IS SYSTEM

The AS-IS system is an outdated POS system that lacks efficiency and operation features such as unavailable feature of EBills , no modern UI etc.

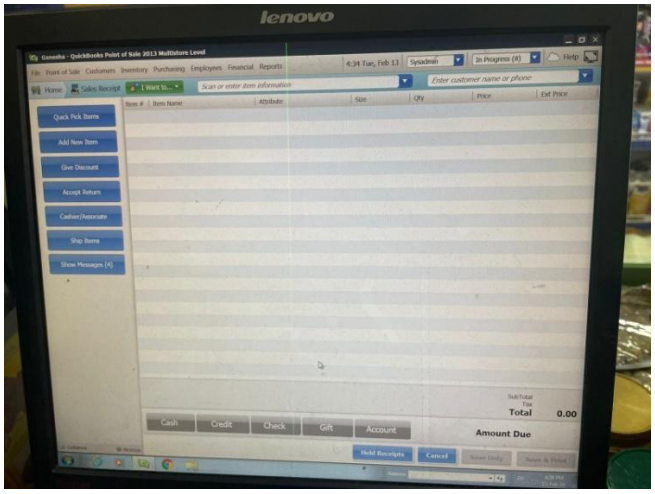


Figure 2.3.1: AS IS System

2.3.2 TO BE SYSTEM

The TO-BE state of our POS system promises an intuitive user interface for seamless inventory management and transactions. It will have barcode scanning for effective product handling and eBill capabilities for electronic payments. Tools for managing customers and staff will improve the quality of the services provided, and more efficient and transparent supplier relationships will guarantee transparency. Our POS system strives to increase customer satisfaction and productivity through ongoing improvement.

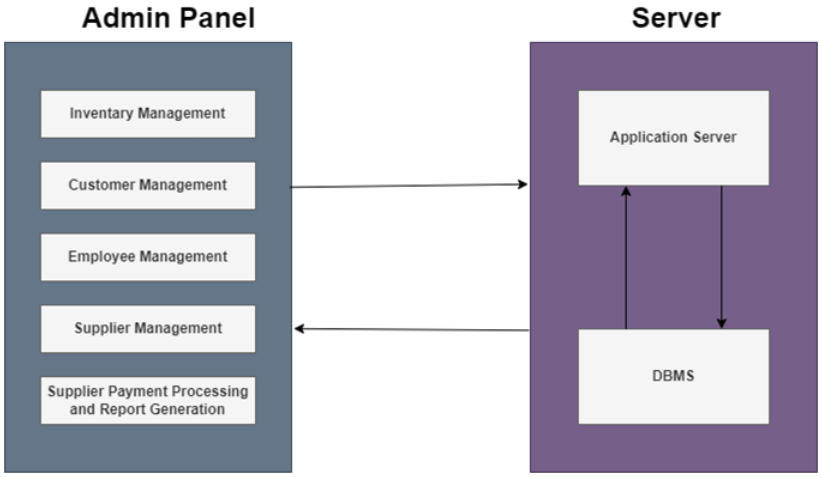


Figure 2.3.2: Architecture Diagram

Figure 2.3.3: TO - BE System

2.4 FUNCTIONAL REQUIREMENTS

The Administrator Panel's functional requirements are outlined across key business functions:

Inventory Management:

This module, overseen by G. Kavinesh, facilitates the seamless addition, removal, and updating of inventory items. It ensures effective tracking of stock levels with low stock alerts, incorporating barcode scanning for efficient management. The system also categorizes and sorts inventory items, integrating with the point-of-sale interface for real-time updates.

Customer Management:

V. Thujithra oversees the customer management module, ensuring customer registration and profile management. The system tracks customer purchase history and preferences, manages loyalty programs with reward point tracking, and incorporates communication features such as email notifications and SMS alerts. Integration with CRM tools enhances customer relationship management.

Employee Management:

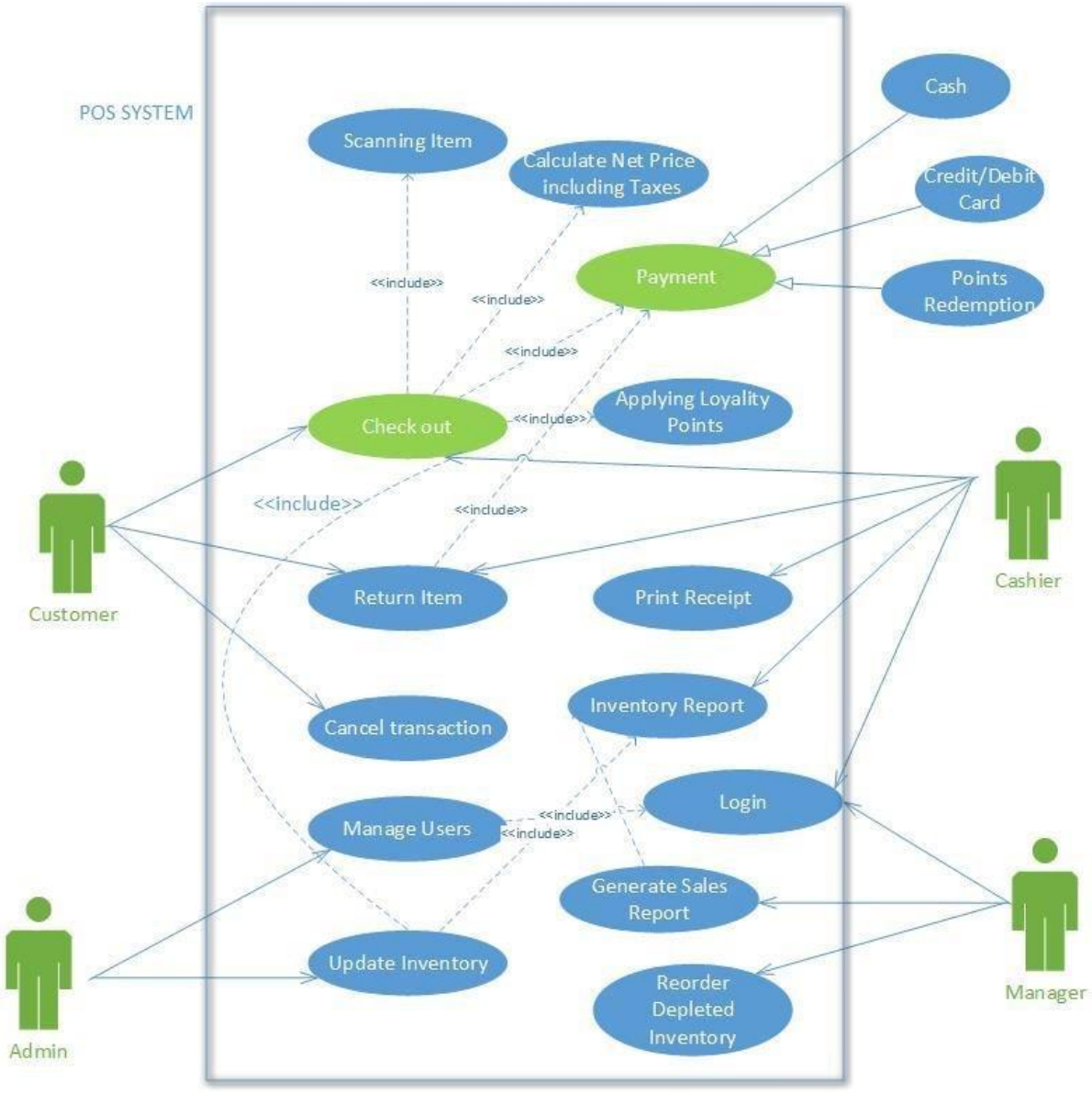
K. Diluksha oversees the employee management module, which includes functionalities such as registration, profile management, access control, and user permissions. The system supports shift scheduling, time tracking, and performance evaluation with feedback mechanisms. Additionally, it integrates seamlessly with HR systems for payroll and benefits management.

Supplier Management:

P. Manav oversees the supplier management module, overseeing supplier registration and profile management. The system manages supplier contact information and communication, handles purchase order creation and management, and evaluates supplier performance with feedback mechanisms. Integration with supplier management systems streamlines procurement processes.

Supplier Payment Processing & Report Generation:

Under the guidance of S. Vickash, this module focuses on supplier payment processing, including invoice tracking and payment scheduling. The system generates supplier-related reports, such as purchase orders and payment summaries, with customizable reporting features for analyzing supplier performance and transaction trends. It also provides export functionality for report data in various formats, such as PDF and CSV.



2.5 NON-FUNCTIONAL REQUIREMENTS

- Performance: Effective management of large numbers of transactions and minimal reaction times for essential features.
- Dependability: minimal downtime and high system reliability and failover and redundancy built right in.
- Safety: adherence to security procedures that are industry standard and for protection, use data encryption and access controls.
- Usability: Easy-to-use interface with intuitive controls and employee training requirements are minimal.

2.6 DEVELOPMENT REQUIREMENTS.

We will use IntelliJ with Java for development and SQL for database management in our Administrator Panel implementation. This is the breakdown:

Management of SQL Databases:

To efficiently manipulate, retrieve, and store data, SQL will be utilized.
It offers strong data management features for the backend of our application.

Using IntelliJ with Java:

Our main development environment will be Java and the IntelliJ IDE. A user-friendly environment for writing, debugging, and testing Java applications is provided by IntelliJ. Because of its adaptability and consistency, Java is a great choice for developing dependable backend systems.

Our Administrator Panel will have a strong foundation because we use SQL for database operations and IntelliJ with Java for development. This allows for effective data management and streamlined development procedures.

2.7 RUNNING ENVIRONMENT REQUIREMENTS

The Administrator Panel's running environment requirements are summarized as follows in brief:

Compatibility of Operating Systems: support for Linux, macOS, and Windows operating systems.

Hardware prerequisites: A modern CPU, Min 4gb RAM, and enough disk space.

Dependencies on Software: MySQL database, Node.js, Express.js, and Java Runtime Environment (JRE).

Network Interconnectivity: Reliable internet access for client-server interaction
.
Security Points to Remember: Installation of secure communication protocols, firewalls, and antivirus programs.

Performance and Scalability: Load balancing and scalable architecture to handle higher user loads.

Observation and Record-Keeping: Tools for tracking events through logging and monitoring system performance metrics.

2.8 QUALITY ASSURANCE PLAN

Objective: Ensure the upgraded POS system meets quality, reliability, and performance standards.

Approach: Comprehensive testing at all development stages: unit, integration, system, and user acceptance testing.

Automated testing frameworks and regression testing for thorough coverage. Functional, performance, security, and compatibility testing.

Documentation: Document test plans, cases, and results for traceability and transparency. Maintain records of requirements, design specs, and configurations.

Review and Feedback: Regular code, design, and UI reviews to catch issues early. Gather feedback from stakeholders and end-users for validation and improvement.

Continuous Improvement: Address defects, issues, and enhancements post-deployment. Conduct post-implementation reviews for process enhancement.

Roles and Responsibilities: Define clear roles for QA activities, ensuring collaboration and shared objectives.

Timeline and Milestones: Align QA activities with project schedule, monitor progress, and adjust as needed.

By following this plan, we ensure the POS system is robust, reliable, and aligned with stakeholder expectations.

3 EXPECTED PROJECT RESULTS

3.1 DELIVERABLES

New UI Design and Implementation: A visually appealing and user-friendly interface will be designed and implemented for the Administrator Panel. The new UI will enhance user experience and streamline navigation for administrators and users.

POS Software Update with eBill Features: The POS software will undergo an update to incorporate eBill features, allowing electronic bill payments. Customers will have the convenience of paying bills electronically, improving transaction efficiency and customer satisfaction.

Dropdown Menu for Variable Pricing: A dropdown menu functionality will be added to the POS system, enabling users to select different prices for a single barcode during product billing. This feature enhances flexibility in pricing strategies and improves accuracy in transaction processing.

Documentation for Administrators and Users: Comprehensive documentation will be prepared for administrators and users, detailing system functionalities, procedures, and troubleshooting guidelines. Administrators will have access to technical documentation for system configuration and maintenance.

Users will receive user-friendly guides for navigating the POS system and utilizing its features effectively.

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3.2 MEASURES OF SUCCESS

Summary of Assessment Plan:

- Transaction Processing Time:
  Measure: Reduce average transaction processing time from 30 to 20 seconds.
  Relevancy: Enhances customer satisfaction and operational efficiency.
  Improvement: 33% reduction in processing time.
- Customer Satisfaction Ratings:
  Measure: Increase ratings from 8 to 9 out of 10.
  Relevancy: Reflects effectiveness in meeting customer needs.
  Improvement: 12.5% increase in satisfaction.
- Error Rate in Billing:
  Measure: Decrease error rate from 5% to 2%.
  Relevancy: Ensures accuracy in transactions and financial integrity.
  Improvement: 60% reduction in billing errors.
- Adoption Rate of eBill Features:
  Measure: Increase adoption rate from 20% to 40%.
  Relevancy: Reflects effectiveness of electronic bill payments.
  Improvement: 100% increase in eBill adoption.
- User Training Completion Rate:
  Measure: Increase completion rate from 70% to 90%.
  Relevancy: Ensures staff proficiency in using the POS system.
  Improvement: 28.5% increase in training completion.

Regular monitoring of these measures will help gauge project success and identify areas for further optimization in the POS system operation.

4 BUDGET

Phase	Estimated Cost	
Personal Costs		
Software Developer		$200
UI/UX Designer		$225
Project Manager		$270
Marketing		$120
Technology and Infrastructure		
Admin Dashboard		$110
SSL Certificate		N/A
Payment Gateway Setup		$100
Maintenance		
Regular Maintenance		$120
Improvements		$100
Security Measures		$75
Content Creation		
Product Details		$300
Graphics and Visual Assets		$250
Total Cost	Total Cost	$1870

5 ROLES AND RESPONSIBILITIES

These rules and responsibilities stated below will ensure clear accountability and efficient task allocation within team members along with making sure that each member understand their specific duties and maintain project discipline.

Note – We do not have a project sponsor currently because this project is undertaken without sourcing any funds into. But we can name our client as the project sponsor as he has guided us with the project objectives.

Role	Responsibility	Participant(s)
Project Sponsor	Guiding the team with the project objectives , offering insights into what we need , such as providing invoices to refer on how they work , moreover providing access for us to make use of his resource to perform our project.	**Hariprashanth Chandrakumar**
Project Leader	Acting as a primary contact , allocating roles appropriately and mainly resolving the conflicts between team members.	**G Kavinesh** – Overall Leader
Analysis	Taking charge of evaluating the project's , and making sure the project follows agile .	**V Thujithra** – will lead this role with collaboration of rest of the team.
Design	Planning the UI/UX for the POS system . Collaborate with the development team to align design with user needs.	**K Diluksha** – will take charge as the leader in this role with collaboration of rest of the team.
Implementation	Design , develop and test features for the POS system . Collaborate with other members and understand requirements.	**K Vickash** – will take charge as the leader in this role with collaboration of rest of the team. All members will be heavily involved in this role
Testing	Develop and execute test plans to ensure the quality of the POS system and collaborate with team to identify defects,	**P Manav Pranavin**– will take charge as the leader in this role with collaboration of rest of the team.

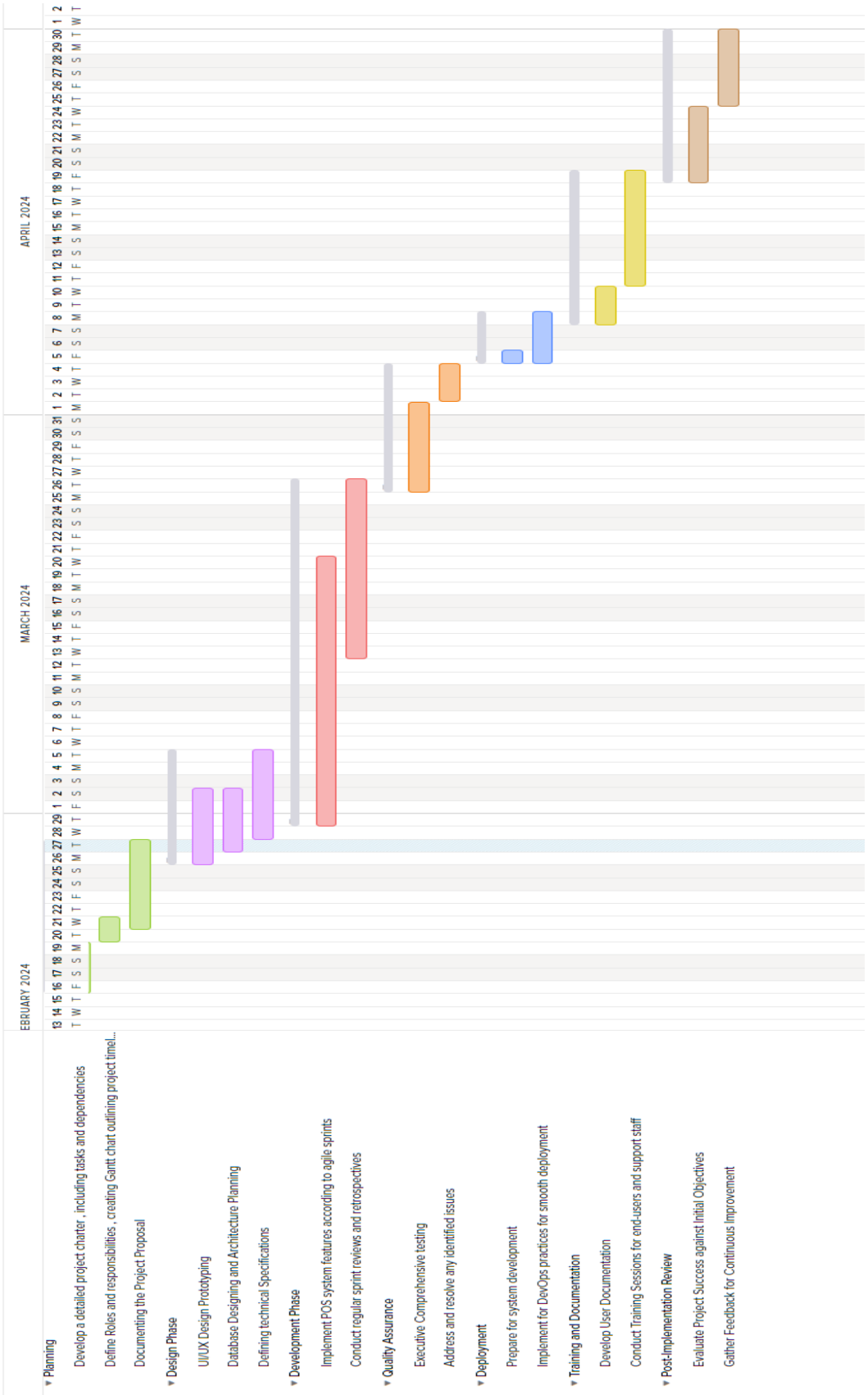
Table 3.2.1: Roles and responsibilities of the project.

6 SCHEDULE

Task	What is completed in this task?	Schedule
Initiation	Defining project scope , objectives , requirements and establishing communication channels	12/02/24 – 16/02/2024
Planning	Project charter , defining roles and responsibilities and documenting project proposal	16/02/2024 – 21/02/2024
Design Phase	UI/UX designing , database architecture planning	23/02/2024 – 05/03/2024
Development Phase	Implementing POS System features according to Agile Sprints	29/02/2024 – 26/03/2024
Quality Assurance	Comprehensive testing and resolving issues	26/03/2024 – 04/04/2024
Deployment	Prepare system for usage , implement DevOps practices for deployment	05/04/2024 – 08/04/2024
Training and Documentation	Develop user documentation, conduct training sessions for end users	08/04/2024 – 20/04/2024
Post Implementation review	Evaluate project success against initial objectives	21/04/2024 – 30/03/2024

Table 3.2.2: Schedule

GANTT CHART


EBRUARY 2024
MARCH 2024
APRIL 2024
Planning
Develop a detailed project charter , including tasks and dependencies
Define Roles and responsibilities , creating Gantt chart outlining project timel...
Documenting the Project Proposal
Design Phase
UI/UX Design Prototyping
Database Designing and Architecture Planning
Defining technical Specifications
Development Phase
Implement POS system features according to agile sprints
Conduct regular sprint reviews and retrospectives
Quality Assurance
Executive Comprehensive testing
Address and resolve any identified issues
Deployment
Prepare for system development
Implement for DevOps practices for smooth deployment
Training and Documentation
Develop User Documentation
Conduct Training Sessions for end-users and support staff
Post-Implementation Review
Evaluate Project Success against Initial Objectives
Gather Feedback for Continuous Improvement

7 REFERENCES

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[4] Clean Code: A Handbook of Agile Software Craftsmanship by Robert C. Martin (Prentice Hall, 2008)

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8 APPENDICES