FlowLog: Web based workflow and monitoring system for PainTeng Shop, Bagong-ilog, Pasig City

CHAPTER I

INTRODUCTION

The need for motorcycle restoration and customization has significantly increased in the current automotive service scene as motorcycles become a key means of transportation and a medium for individual expression. Motorcycle painting shops are at a critical crossroads between the need for modern operational efficiency and traditional skill as client expectations for speed, transparency, and high-quality finishes rise. The administration of painting artistry, particularly task monitoring and workflow management, demands a level of precision that manual approaches can no longer consistently offer, even though painting artistry itself is still a manual skill. In order to improve overall service delivery and business resilience, this study focuses on the shift from traditional to digital job monitoring within small-scale service centers. PainTeng Shop, situated in Bagong Ilog, Pasig City, is a prime example of a company facing the constraints of "analog" management in this booming yet cutthroat industry. The business now uses a lot of manual job monitoring, tracking a project's lifecycle through verbal updates and handwritten logs. Although these techniques are inexpensive, they are intrinsically vulnerable to human mistake, which can lead to lost documents, disjointed communication, and lengthy delays. The painting process is a multi-phase workflow that necessitates smooth coordination and includes

receiving job orders, surface preparation, color matching, painting, and final quality inspection. The interdependence of these jobs breaks down in the absence of a centralized system; a misinterpretation in a painter's assignment or a delay in material procurement can block the entire production line, resulting in missed deadlines and eroded client trust. Furthermore, management is unable to identify operational bottlenecks in the shop or obtain a clear picture of daily production due to the lack of real-time data. The mental and administrative strain of keeping manual records grows as the number of clients rises, which frequently results in inconsistent performance and makes it challenging to produce the precise reports required for long-term strategic choices. Therefore, in order to provide a digital remedy, this study looks into the particular operational friction spots at PainTeng Shop.

Project Background and Context

The rapid advancement of information and communication technologies has significantly transformed how businesses manage their operations, emphasizing the importance of efficiency, transparency, and customer-centered service. In particular, service-oriented industries such as motorcycle repair and painting shops rely heavily on accurate scheduling, effective task delegation, and timely updates to ensure high-quality outcomes and customer satisfaction.

PainTeng Shop, a local enterprise based in Bagong Ilog, Pasig City, specializes primarily in **motorcycle painting and refinishing services**. The shop focuses on restoring and repainting motorcycle parts and bodies according to customer

requests. It is important to note that **PainTeng Shop does not engage in art customization, decal installation, or other forms of aesthetic artwork**, as its primary service scope centers solely on standard painting, refinishing, and color restoration. Despite the straightforward nature of its operations, the shop faces several organizational challenges that hinder its productivity and service quality.

At present, PainTeng Shop relies heavily on **manual, paper-based processes** to record job orders, assign tasks, and track progress. Communication among staff members and with customers is primarily conducted through verbal instructions or handwritten notes. This traditional setup has led to various operational inefficiencies, including delays in job monitoring, miscommunication in task delegation, disorganized record-keeping, and limited transparency in workflow progress. The absence of a structured system also makes it difficult for management to accurately monitor workloads, evaluate performance, and maintain accountability.

These issues not only disrupt daily operations but also affect overall customer satisfaction. In an industry where time efficiency and service reliability are crucial, such inefficiencies can lead to longer turnaround times, customer dissatisfaction, and a decline in trust and competitiveness. As the business continues to accommodate multiple clients, the need for an organized, systematic, and technology-driven solution becomes increasingly vital.

Recognizing these challenges, this study contextualizes the operational struggles of PainTeng Shop within the broader framework of digital workflow management. While the shop's current methods are functional for small-scale operations, they are no longer sustainable in addressing growing customer demands. Therefore, exploring how digital systems can improve monitoring, scheduling, and coordination provides valuable insight not only for PainTeng Shop but also for similar service-oriented businesses seeking to modernize their operations and enhance overall efficiency.

Objectives of the study

This study is to develop FlowLog, a real-time job monitoring and workflow management system designed specifically for PainTeng Shop. The system aims to replace the manual recording of painting jobs with a digital platform that improves documentation, enhances communication, and ensures efficient tracking of both tasks and employees' workflow progress.

Specifically, the study aims to:

Create a real-time system for managing workflow and tracking jobs that can:

1. To monitor the real-time progress of jobs and provide customers with accurate updates on service status and completion time.
2. To organize job tickets and transactions by generating, processing, and storing them in a centralized and systematic manner.

3. To manage employee accounts and task assignments efficiently for better accountability and workload distribution.
4. To track inventory and supplies accurately to ensure availability and prevent delays in operations.
5. To maintain organized data records of completed jobs and customer feedback for reporting and continuous service improvement.

Create a built-in digital user's guide within FlowLog to make it easier for users to comprehend and use the system's functionalities.

Significance of the Study

This study is significant because it develops a workflow management and real-time task monitoring system for PainTeng Shop, a small motorcycle shop. When using manual recordkeeping, the shop frequently has issues including delays, misunderstandings, and mistakes. FlowLog facilitates the digitization of the process, which improves workflow organization, communication clarity, and service speed and dependability.

For the shop owner, the system makes it easier to manage daily operations. It allows them to monitor employee attendance, job progress, and workload. It also provides useful data that can be used to check employee performance and make decisions that will help the shop grow. For employees, the system gives them clear instructions and priorities for their tasks. This reduces confusion, helps them know what to do next, and lets them focus on finishing jobs on time without unnecessary delays.

Customers also benefit because they can see updates on the status of their motorcycles and know when the job will be finished. This makes the process more transparent and builds trust between the shop and its clients. Aside from that, the project can also serve as a guide for future researchers or developers who want to create systems that help small businesses improve their workflow and services.

For future researchers and development in the areas of workflow management and real-time job monitoring. By implementing such a system, PainTeng Shop can achieve more efficient operations, improved employee coordination, and greater customer satisfaction.

Scope and Limitations

The system provides a homepage that displays the shop's offers, promos, and service prices. The admin module allows the shop owner and supervisor to create and manage employee accounts, monitor inventory and stocks, update service offers and pricing, process tickets, monitor queueing pages and access employee functions such as job ticket processing and customer notifications. The employee module enables staff to generate random ticket numbers for customers, encode customer details such as name, contact, address, and requested service, update job progress in real time through defined stages such as receiving, preparation, painting, drying, quality checking, and completion, and send notifications to customers via email.

Employees are also responsible for sending the ticket number and corresponding monitoring link to customers through Messenger. On the customer side, clients may view the shop's services and promotions on the homepage, inquire through Messenger, and track the progress of their motorcycle painting job using the monitoring page linked to their ticket. The system also includes a basic inventory feature that allows monitoring of paint and material stocks to prevent shortages and ensure proper resource management. Finally, the queue monitoring page provides real-time updates on the status of each project, allowing customers to see whether their motorcycle is in the stages of receiving, preparing, painting, drying, quality check, or ready for pick-up.

Although FlowLog provides significant improvements in workflow management, it is subject to certain limitations. The web-based management system will not feature date and time monitoring of the employees. Notification services are limited to email and Messenger, as the system does not support SMS notifications. The system also does not include financial or billing features such as invoicing, receipts, or statements of account, as all payments and transactions are handled manually within the shop**.** The platform does not include financial features such as invoicing, receipts, or online payments; all transactions remain manual and are completed in person at the shop. Employee monitoring is restricted to task assignments and job progress, as the system does not track attendance or working hours. Customer access is also limited, since clients can only monitor the status of their own ticket and cannot

view the queue or the progress of other customers' jobs. In terms of platform scope, FlowLog is a web-based system and is not developed as a standalone mobile application. Finally, the system is dependent on a stable internet connection, meaning that real-time updates may be delayed or unavailable when connectivity is poor.

Definition of Terms

Digital Transformation – Kraus et. al.(2022) Before analyzing how digital transformation has developed in business and management, it is essential to distinguish it from related concepts. Digitization refers to the conversion of analog information into digital form and the automation of processes using technology. This fundamental step serves as the basis for more advanced digital initiatives that drive organizational improvement and transformation.

FlowLog – Refers to the proposed Online Monitoring System for PainTeng Shop, Bagong-ilog, Pasig City developed for PainTeng Shop. It serves as a digital platform that replaces manual records and enables automated monitoring of tasks, projects, and staff assignments.

Inventory Monitoring – Adeboje et. al.(2024) Inventory management is an essential operation for organizations that handle physical products, such as those in manufacturing, retail, or distribution. Its main purpose is to maintain the

appropriate amount of stock at the right time, avoiding both surplus inventory and stock shortages.

Job Ticket – Kenton (2023) A work ticket is a document that records the amount of time an employee spends on a specific task or job. It serves as a reference for billing customers for direct labor costs and can also be used to determine the wages of employees who are compensated on an hourly basis.

Job Tracking – Jhamani et. al (2022) The modern job application process involves multiple steps that require careful management. To increase the chances of securing better employment, applicants must stay organized, respond promptly, and consistently update relevant parties on their application progress..

Notification System – Mumcu et. al. (2025) A feature of FlowLog that sends automated alerts or updates to employees and customers about the progress of their painting jobs.

Real-Time Monitoring – Fajri et. al. (2025) To design an IoT-based integration model capable of efficiently monitoring multiple urban aspects—including traffic flow, energy usage, waste management, and air quality—within a unified system.

Task Assignment – Dvorak et. al. (2023) The process of assigning specific jobs or activities to technicians. In this study, FlowLog automatically assigns and updates tasks to improve efficiency and prevent confusion.

Workflow Management – Hu et. al. (2025) Refers to the organized handling of tasks, resources, and schedules within PainTeng Shop. Through FlowLog, workflow management ensures that each job moves smoothly from one stage (receiving, prepping, coating, finishing) to the next.

CHAPTER II

REVIEW OF RELATED LITERATURE AND SYSTEMS

This chapter reviews existing studies and systems related to real-time job tracking and workflow management, which serve as the foundation for developing **FlowLog: Web based workflow and monitoring system for PainTeng Shop, Bagong-ilog, Pasig City**. It explores how digital solutions address common challenges in small businesses, such as delays,

miscommunication, and inefficiencies in manual operations. By examining related research on time tracking, workflow management, and real-time monitoring, this review highlights the relevance of adopting technology-driven systems in improving productivity, transparency, and customer satisfaction.

Time and Job Tracking Systems

Smith (2021) explained that workflow and job tracking systems improve efficiency by automating repetitive tasks and minimizing errors in manual recording. In small enterprises, these systems also ensure accountability in monitoring workforce performance. Isicok (2022) added that work-hour management tools are essential for identifying inefficiencies and improving operational flow.

Reitsma (2024) stated that time tracking systems provide detailed insights into project costs, including expenses related to reworks, communication, and production. By collecting sufficient time-tracking data, organizations can establish a more accurate cost structure and set competitive pricing for future projects. Timesheet records also allow analysis of the average time employees spend on specific tasks, which, when combined with normal idle hours, help in calculating precise labor costs. Without accounting for these idle periods, projects may be underpriced, leading to revenue loss and inefficiencies.

Hubstaff (2025) explained that time and job tracking systems are important in ensuring that work hours and tasks are properly monitored. They

help prevent revenue loss by recording accurate work durations and ensuring fair billing for services rendered. These systems also promote transparency and trust since employees, managers, and clients can clearly see job progress and updates. In addition, they enhance productivity by reducing delays, minimizing errors, and providing clear task priorities. Job tracking records also provide valuable data that can be used to create more accurate project estimates for future work.

TCP (2025) emphasized that tracking employee time and work hours provides organizations with valuable insights for optimizing schedules, reducing payroll errors, and effectively managing labor expenses. Properly implemented time and attendance systems also support compliance with regulations while ensuring better cost control. In addition, these systems contribute to improved operational efficiency and create a more positive experience for employees.

Gallimore (2025) highlighted that digital management systems support a flexible business model by allowing organizations to adapt quickly to changes. They ensure accurate payroll through automated time tracking, reducing errors in employee compensation. These systems also act as a centralized hub for projects, providing easy access to updates and progress. Furthermore, they enable a smooth and fast timesheet approval process, helping supervisors validate work hours efficiently.

Workflow Management

According to Inpensa (2020), workflow systems ensure proper resource allocation, provide clarity in employee responsibilities, and improve accountability. Smith (2021) supported this by stating that workflow tools automate repetitive tasks, leading to fewer errors. Dizon (2023) found that workflow tools in small enterprises in the Philippines reduced delays and improved resource allocation, proving their value in enhancing productivity.

Ferguson (2024) noted that digital job tracking and workflow systems provide improved visibility of tasks, leading to greater efficiency and reduced errors. They result in happier clients by keeping them informed and minimizing delays. These systems also offer scalability, adapting to business growth while helping to save time and money through automation. In addition, they ensure better documentation, keeping records organized and accessible.

Schwarz (2025) explained that a workflow provides a structured plan that guides the progression of tasks from initiation to completion. While there may be multiple approaches to achieving the same outcome, workflow management focuses on identifying the most efficient path to minimize delays and errors. Its primary goal is to ensure that employees follow clear directions, reducing unnecessary steps and confusion in the process. In cases where unexpected issues arise, an effective workflow plan can redirect tasks and keep operations on track. When workflows are properly managed, overall processes become more organized, resulting in smoother and more efficient operations.

Kashyap (2025) stated that workflow systems are effective tools for improving organizational processes. They allow for streamlined tasks by providing clear steps and reducing unnecessary delays. These systems also support better collaboration, as team members can easily share updates and coordinate responsibilities. At the same time, they strengthen accountability by recording individual contributions and tracking progress. With increased transparency, managers and employees are always aware of the status of each task. Altogether, these benefits result in enhanced productivity, ensuring that work is done more efficiently and effectively.

Reijer (2025) Workflow management systems (WMS) are recognized for enhancing organizational performance; however, their actual impact has not been extensively measured through quantitative and systematic studies. A longitudinal, multi-case study involving six Dutch organizations examined 16 business processes to assess WMS effectiveness using metrics such as lead time, service time, wait time, and resource utilization. The results indicated significant performance improvements across most processes. Additionally, the study provided insights into simulating administrative processes, collecting performance data, understanding process characteristics, and implementing workflow management systems.

Real-Time Monitoring and Transparency

Inpensa (2020) highlighted that workflow systems can improve transparency, which helps businesses reduce risks and ensure accountability.

Isicok (2022) mentioned that work-hour management allows for real-time insights into efficiency. Lopez et. al. (2022) emphasized that transparency builds stronger trust between clients and service providers. Homebase Team (2023) pointed out that providing real-time updates improves customer satisfaction by reducing uncertainty and delays, while Dizon (2023) stressed that real-time coordination helps small businesses manage tasks more effectively.

Parhi et al. (2025) explained that transparency refers to the ability to monitor operations in real time, allowing corrective actions to be taken immediately when issues arise. It involves tracking processes continuously, increasing the visibility of tasks, and ensuring smooth communication across the system. In the context of workflow and job tracking, transparency is essential for keeping all stakeholders informed and aligned. However, some studies highlight the lack of proper measures to fully assess transparency in digital environments, indicating the need for further evaluation methods.

Edge Delta Team (2025) defined real-time monitoring as the continuous observation and analysis of data with minimal delay. It allows quick detection of irregularities, generates alerts, and helps identify opportunities for process improvement. This approach involves the collection, transmission, processing, and visualization of data to ensure efficiency and resource optimization. Studies highlight that when applied effectively, real-time monitoring supports faster problem-solving and enhances overall system performance.

Tae-Hyeon et. al. (2025) The increasing demand for healthier food options has led to a shift in dietary patterns, promoting the consumption of nutrient-dense and minimally processed products such as fruit juices. This has resulted in growing interest in juicing and concentration technologies for producing nutritious beverages. In parallel, the development of smart postharvest management systems—integrating ICT, big data, artificial intelligence, and remote sensing—has gained attention for enhancing product quality, extending shelf life, and reducing nutrient loss. These innovations support the production of healthier and more sustainable juice products that align with evolving consumer preferences

Synthesis

The reviewed literature highlights that digital management systems have become vital tools in improving organizational efficiency, accuracy, and transparency. The adoption of automated time and job tracking systems has been shown to enhance accountability by accurately recording work hours, minimizing payroll discrepancies, and supporting precise project cost management. Similarly, research on workflow management emphasizes that structured and automated processes enable better resource allocation, reduce operational delays, and foster stronger collaboration among team members.

In addition, studies on real-time monitoring and transparency tools demonstrate their importance in providing immediate access to operational data, allowing organizations to respond promptly to changes and maintain customer trust.

These tools not only improve visibility across different stages of operation but also contribute to more informed and data-driven decision-making.

Overall, the integration of digital management technologies significantly streamlines business operations, enhances coordination, and supports continuous organizational improvement. By promoting accuracy, accountability, and adaptability, these systems play a crucial role in achieving higher productivity and sustained competitiveness in modern service-oriented industries.

CHAPTER III

DESIGN AND METHODOLOGY

Technical Background

In this chapter, the researchers present the technologies, frameworks, and development standards used to design and implement the **FlowLog: Web based workflow and monitoring system for PainTeng Shop, Bagong-ilog, Pasig City.** The system aims to improve the operational workflow of a motorcycle painting shop through process automation and digital monitoring. This chapter also discusses the methodology applied in the system's

development, outlining the structured approach taken to ensure the system's efficiency, reliability, and usability. Furthermore, it explains the programming languages, tools, and hardware requirements necessary to support the overall functionality of the system. Lastly, this section details how the system operates, highlighting user interactions and system processes across various access levels.

Technicality of the Project

The researchers employed the Agile methodology in the development of the system. Agile is an iterative software development approach that emphasizes continuous feedback, flexibility, and progressive improvement. This method allowed the team to conduct regular testing, review feedback, and apply necessary revisions throughout each development phase. The process began with the gathering of requirements through interviews and observations at the painting shop, ensuring that the system aligns with the actual business workflow and user needs.

The PHP programming language serves as the primary back-end language for system development. PHP was chosen for its compatibility with MySQL, which functions as the relational database management system (RDBMS). This combination enables efficient handling of core functionalities such as ticket generation, job progress updates, and inventory monitoring.

The front-end design utilizes HTML, CSS, JavaScript, and Bootstrap to ensure a responsive and user-friendly interface. Bootstrap, a widely used

front-end framework, provides pre-designed components and a grid system that ensures mobile responsiveness and consistency across all pages. Together, these technologies allow for smooth navigation and real-time updates, particularly within the Queue Monitoring Page, where customers can view live progress of their motorcycle painting jobs.

The system incorporates Role-Based Access Control (RBAC) to manage different levels of user privileges. The Administrator has full access to manage employees, monitor stocks, and modify offers; the Employee can create customer tickets, update job progress, and send notifications; while the Customer can view service offers, set up appointments, and monitor progress through the website. This design ensures operational security, preventing unauthorized access to sensitive data.

Details of Technologies Used

The **FlowLog Painting Shop Online System** leverages several modern web technologies to ensure functionality, stability, and efficiency:

Front-End Development:

The interface is built using HTML and CSS for page structure and styling, Bootstrap for responsive design and layout consistency, and JavaScript for dynamic interaction and asynchronous updates. Bootstrap's reusable components such as modals, navigation bars, and progress bars enhance both usability and aesthetic appeal, ensuring that the system adapts seamlessly across different screen sizes.

Back-End Development:

PHP serves as the back-end scripting language, responsible for handling server-side logic such as user authentication, ticket creation, and process tracking. It communicates with the MySQL database to store and retrieve data efficiently.

Database Management:

MySQL is used as the database management system to organize and store information related to customers, employees, services, and inventory. It supports CRUD (Create, Read, Update, Delete) operations necessary for daily business transactions.

Server Environment:

The system is developed and tested using XAMPP, an integrated environment that includes Apache for hosting web applications and MySQL for database management.

Communication and Notification:

The system provides email-based notifications using the built-in PHP mailer function. Employees can send updates and completion notices to customers. In addition, communication through Facebook Messenger is integrated for inquiries and service tracking.

Hardware Requirements:

The system requires a standard desktop or laptop computer, reliable internet connection, and a local or online web server for deployment.

Optional hardware, such as a printer, may be used for generating receipts or service records.

How the Project Works

The **FlowLog Painting Shop Online System** automates and simplifies the workflow of the painting shop. The process begins when a Customer accesses the official website to book a painting service. The customer fills out the online booking form, which includes details such as name, contact information, motorcycle type, and preferred service package. Once the booking is submitted, the system automatically generates a unique ticket number and records the job in the database.

The Employee then reviews the booking, updates its status (e.g., Received, Preparing, Painting, Drying, Quality Check, and Ready for Pick-up), and manages job progress within the system. These updates are displayed in real time on the customer's dashboard, allowing them to track their motorcycle's painting progress online.

Meanwhile, the Administrator oversees all operations, including employee performance, ongoing jobs, service offers, and stock levels. The Inventory Module provides low-stock alerts for materials such as paint and supplies to ensure continuous operation.

By integrating online booking and real-time monitoring, the FlowLog system eliminates the need for external communication platforms, reduces

manual errors, and improves service efficiency and transparency. When implemented on a local or web-based server, it ensures reliable access, efficient management, and customer satisfaction across all levels of operation.

Functional and Non-Functional Requirements

The functional and non-functional requirements describe FlowLog: Web based workflow and monitoring system for PainTeng Shop, Bagong-ilog, Pasig City. will operate to meet its goals of improving workflow, communication, and customer satisfaction. These requirements ensure that the system performs efficiently while remaining secure, reliable, and easy to use.

Functional Requirements

FlowLog provides secure user login with role-based access, allowing only authorized users such as the admin, employees, and customers to access their specific modules. The system includes job ticket management where employees can create, update, and store job records that contain customer information, service details, and technician assignments. It also allows the tracking of each painting job as it moves through the stages of receiving, prepping, coating, finishing, and pickup. Real-time updates are shown to both employees and customers, ensuring clear communication. The system automatically sends email notifications to customers and staff about job

progress or completion. It also includes an inventory monitoring feature to help the admin track paint materials and supplies, preventing shortages. A scheduling and task assignment function allows the admin to assign specific jobs to employees and monitor their progress. The homepage displays shop information, services, and promos, while customers can check their job status and give feedback after service completion. FlowLog can also generate reports about job history, employee performance, and overall productivity. Search and filter tools make it easier to find customer records and job details quickly.

Non-Functional Requirements

FlowLog is designed to be scalable, meaning it can handle more users or features in the future. Security is a major priority, with encrypted user data and role-based access to prevent unauthorized use. The system is user-friendly, designed with a simple and clear interface that is easy to understand even for new users. It also ensures good performance by handling multiple users at once and providing real-time updates with minimal delay. The system maintains reliability by keeping data accurate and consistent across all modules. It is built with a modular structure to make updates and maintenance easier. Being a web-based platform, FlowLog works on major browsers, and it can be accessed through both computers and mobile devices browsers with a stable internet connection. The system also keeps a record of user activities for

transparency and accountability. However, since it is an online system, its performance depends on the quality of the internet connection.

Design of Software, System, and Processes

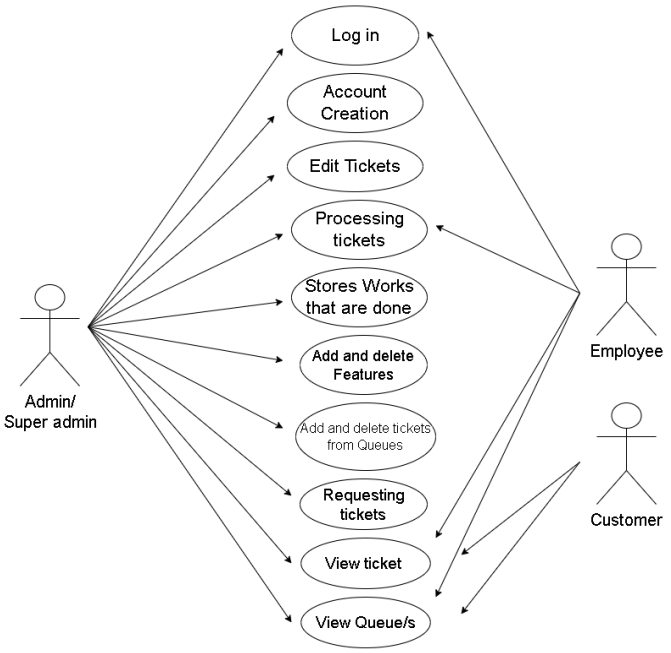
The design of FlowLog: Web based workflow and monitoring system for PainTeng Shop focuses on achieving its main goals—real-time job tracking, organized task assignments, inventory monitoring, and improved communication with customers. The system follows a three-tier structure: a presentation layer (user interface), an application layer (system functions and business logic), and a data layer (database). The user interface is built with web technologies and Bootstrap for a clean and responsive design that works on both computers and mobile devices. The application layer handles job management, scheduling, inventory updates, notifications, and reports. The data layer stores information about users, job records, inventory, and feedback. This structure helps the system stay organized, easy to maintain, and ready for future updates.

The researchers used Draw.io, a tool to create a flowchart that will explain how the system will work, progress, make and things that are accessible for all the users. Figure 1's Use Case Diagram illustrates how the system's three primary users—Admin, Employee, and Customer—interact with one another. Depending on their duties, each user has distinct roles and access. The system is completely within the administrator's control. To

guarantee seamless operations, they may handle and monitor tickets, manage inventories, create staff accounts, and supervise all system operations. The employee manages daily duties such delivering email notifications, processing client tickets, and updating job progress. For walk-in clients, they can also make new tickets and modify or cancel them as necessary. Through the queueing page, the customer can monitor the status of their motorcycle painting project and see simply their ticket number. Transparency and convenience are offered by this feature without necessitating direct connection.

Figure 1

Use Case Diagram

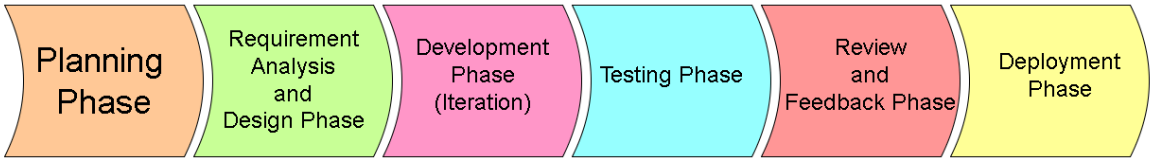


Methodology

The Agile Process Model is a flexible and iterative software development methodology that emphasizes cooperation, flexibility, and ongoing enhancement. Agile breaks the project up into smaller, more manageable stages known as iterations or sprints rather than finishing it in a rigid order. Every stage results in a functional system that can be examined, tested, and enhanced in response to user input. The planning phase, which establishes the project's goals, parameters, and schedule, is where the process starts. The Requirement Analysis and Design Phase then prepares the design framework and determines the features that the system must have. The system is constructed in phases during the Development Phase (Iteration), enabling the team to make modifications at the conclusion of each cycle.

Figure 2

Agile process model



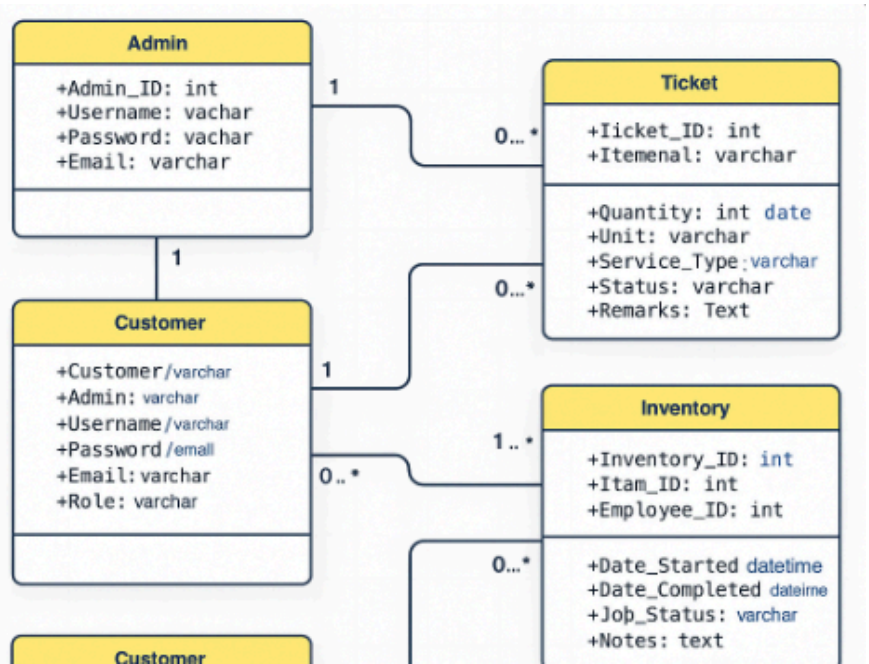
To clearly show how the system works, UML diagrams such as class diagrams, sequence diagrams, and flowcharts are used. These diagrams illustrate how different.

UML diagram

Through entities like Ticket, Inventory, Job History, and Email Notification, the Admin, Employee, and Customer interact in the FlowLog: Web based workflow and monitoring system for PainTeng Shop Entity-Relationship Diagram (ERD). Customers track their painting requests online, employees update job progress and materials used, and the administrator oversees users, jobs, and inventory. The ERD shows a well-structured data flow that links all users and guarantees efficient system operations, transparent monitoring, and transparency.

Figure 3

UML class diagram

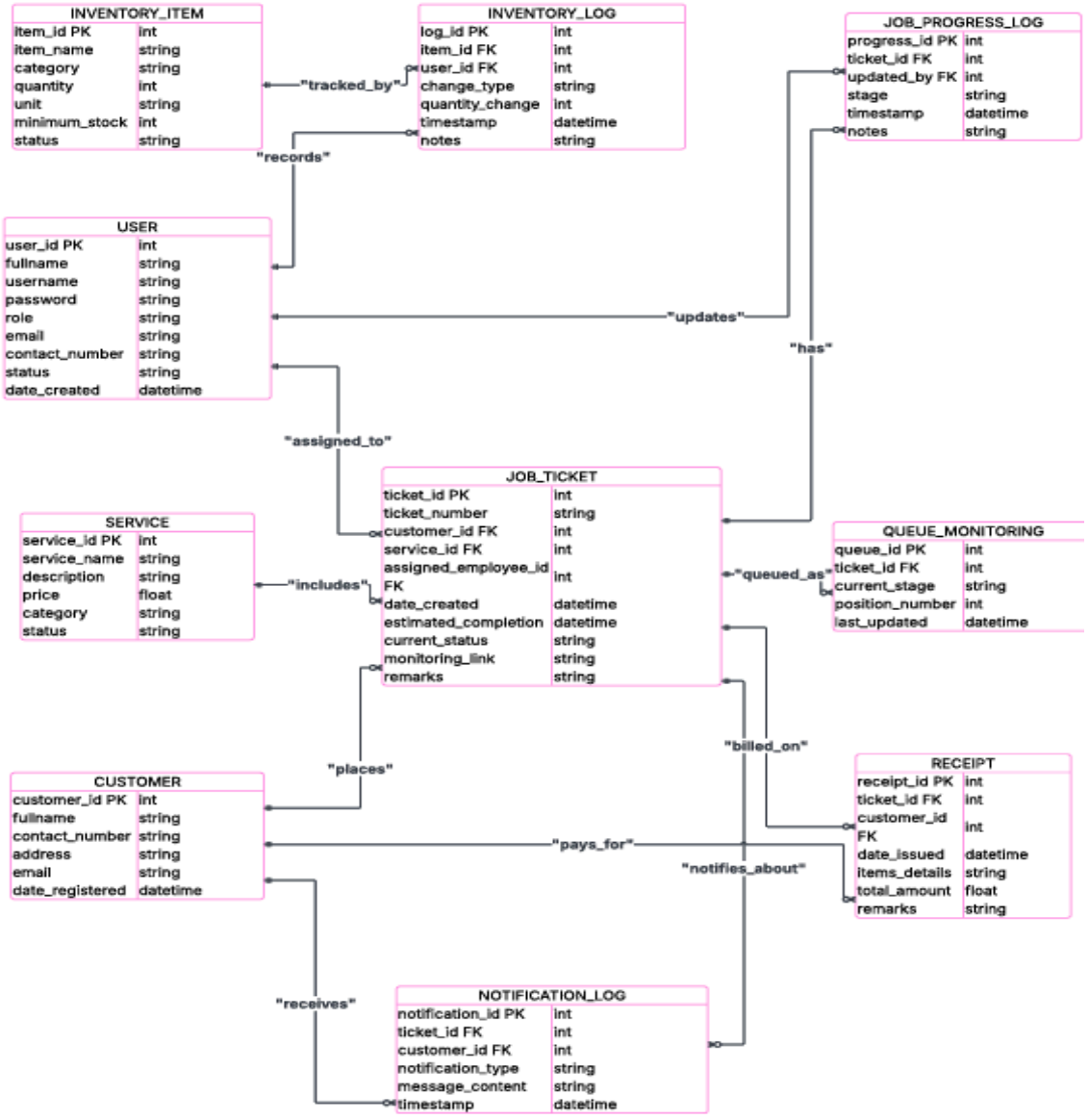


Data Design

This ERD illustrates the data flow in the PainTeng Shop's FlowLog: Web based workflow and monitoring system. To effectively manage and track painting jobs, it links important entities such as the administrator, employee, customer, ticket, job history, inventory, and email notification. Customers receive real-time information via email notifications, administrators supervise operations, and staff members complete and update duties as given. While the Job History and Inventory guarantee precise tracking of progress and materials used, the Ticket serves as the central component of the system, connecting job details, employees, and clients.

Figure 4

Entity Relationship Diagram (ERD)



Levels of Data Flow Diagram

The Data Flow Diagram (DFD) illustrates how data moves throughout the Painting Shop Management System, representing the interaction between users, processes, and data stores. It helps visualize how inputs are transformed into outputs through the system's different functions. The following

figures demonstrate the DFD levels that show both the overall and detailed structures of the proposed system.

Figure 5 presents the Context Diagram, which provides a high-level overview of the entire system. It shows how the Painting Shop Management System interacts with its external entities such as the Admin, Employee, and Customer. At this level, the system is represented as a single process that receives customer job requests, processes them through employees, and provides updates or outputs such as job status, schedules, and completion notifications. This diagram defines the system's scope and establishes the boundaries between the internal processes and the external actors.

Figure 5

Context Diagram

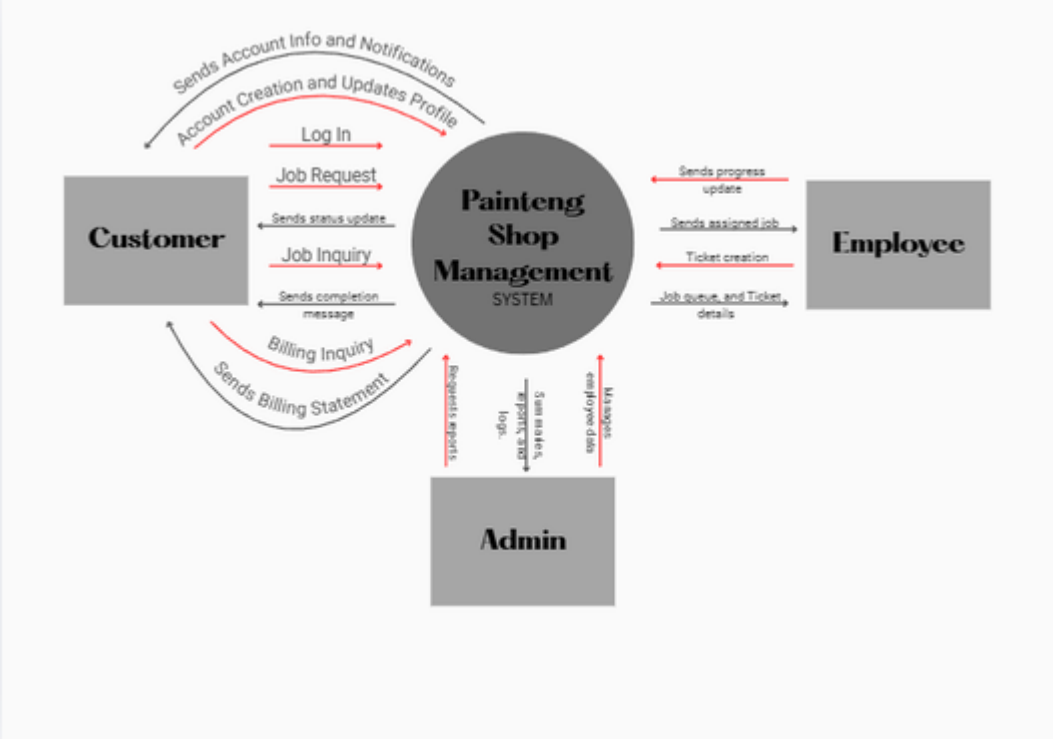


Figure 6 shows the Level 1 Data Flow Diagram, which breaks down the main process from the Context Diagram into several sub-processes. This level illustrates the detailed data flow between components such as Job Request Management, Ticket Generation, Job Monitoring, and Record Maintenance. The Admin manages employee accounts, service lists, and system data; Employees handle customer job entries and painting progress; and Customers view their job status or queue through the monitoring page. This level provides a more specific understanding of how data is processed and shared across different parts of the system.

Figure 6

DFD - Data Flow Diagram level 1

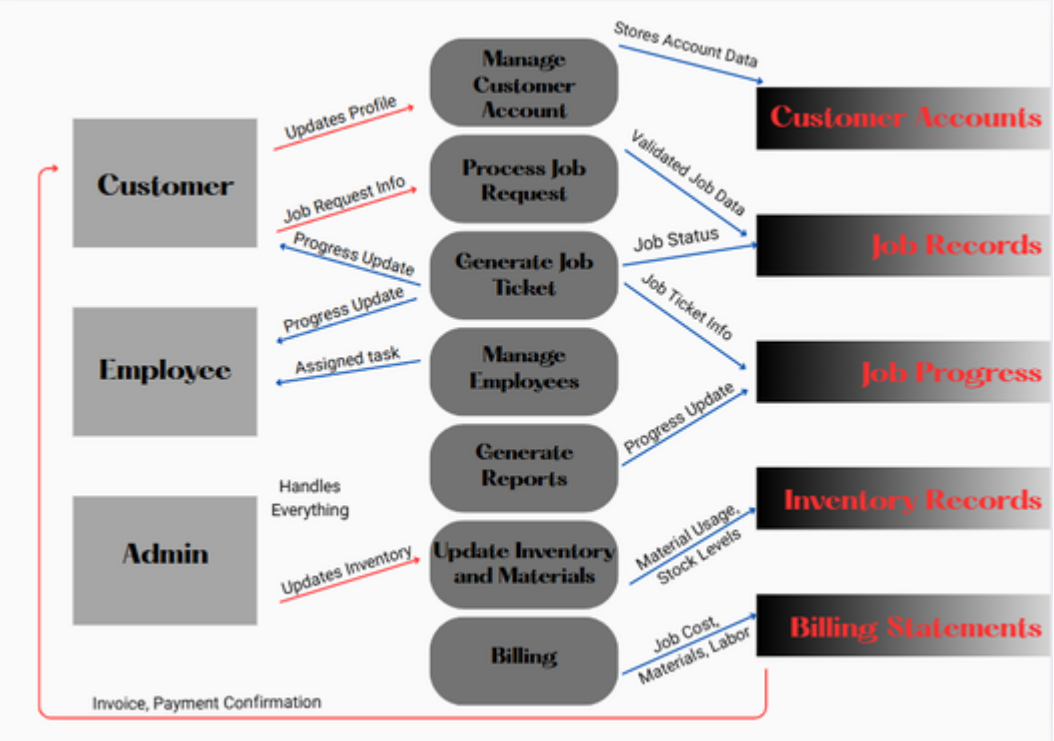
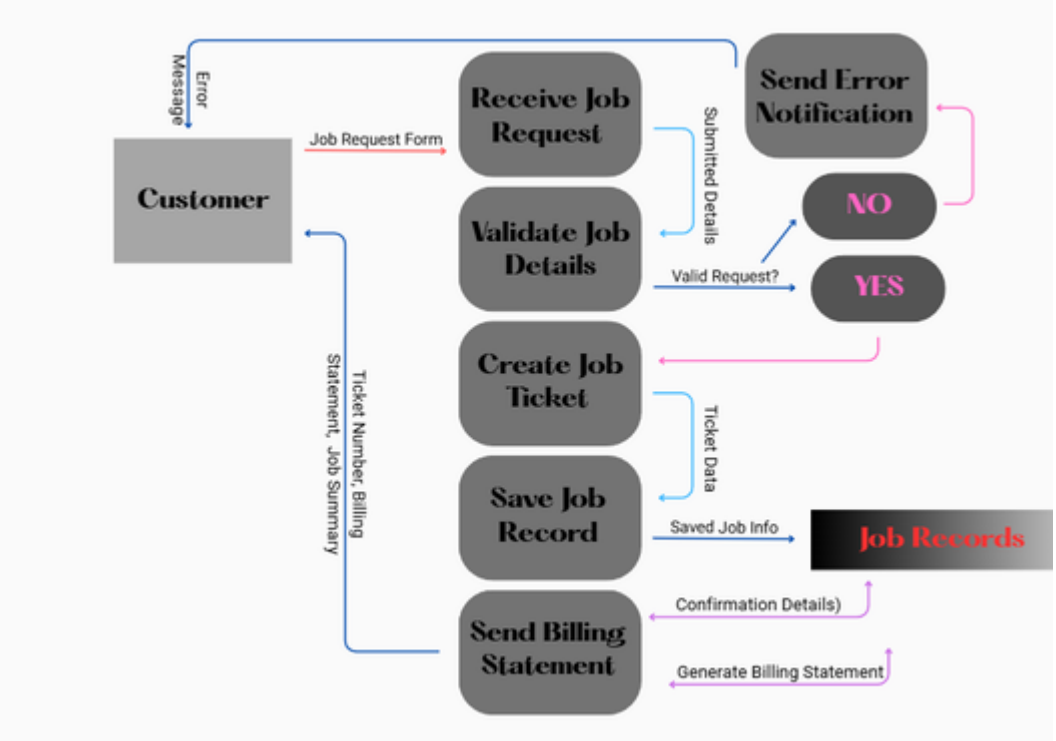


Figure 7 illustrates the Level 2 Data Flow Diagram, which focuses on the internal operations of key sub-processes, particularly Job Request Validation and Ticket Processing. When an employee validates a customer's request, the system checks for completeness and correctness of the details before proceeding. If the request is valid, a job ticket is generated and stored in the database for tracking. If invalid, the employee is prompted to review or correct the data. This level ensures that all transactions are accurate and consistent before moving to the next workflow stage.

Figure 7.1

DFD - Data Flow Diagram level 2



System Flowcharts

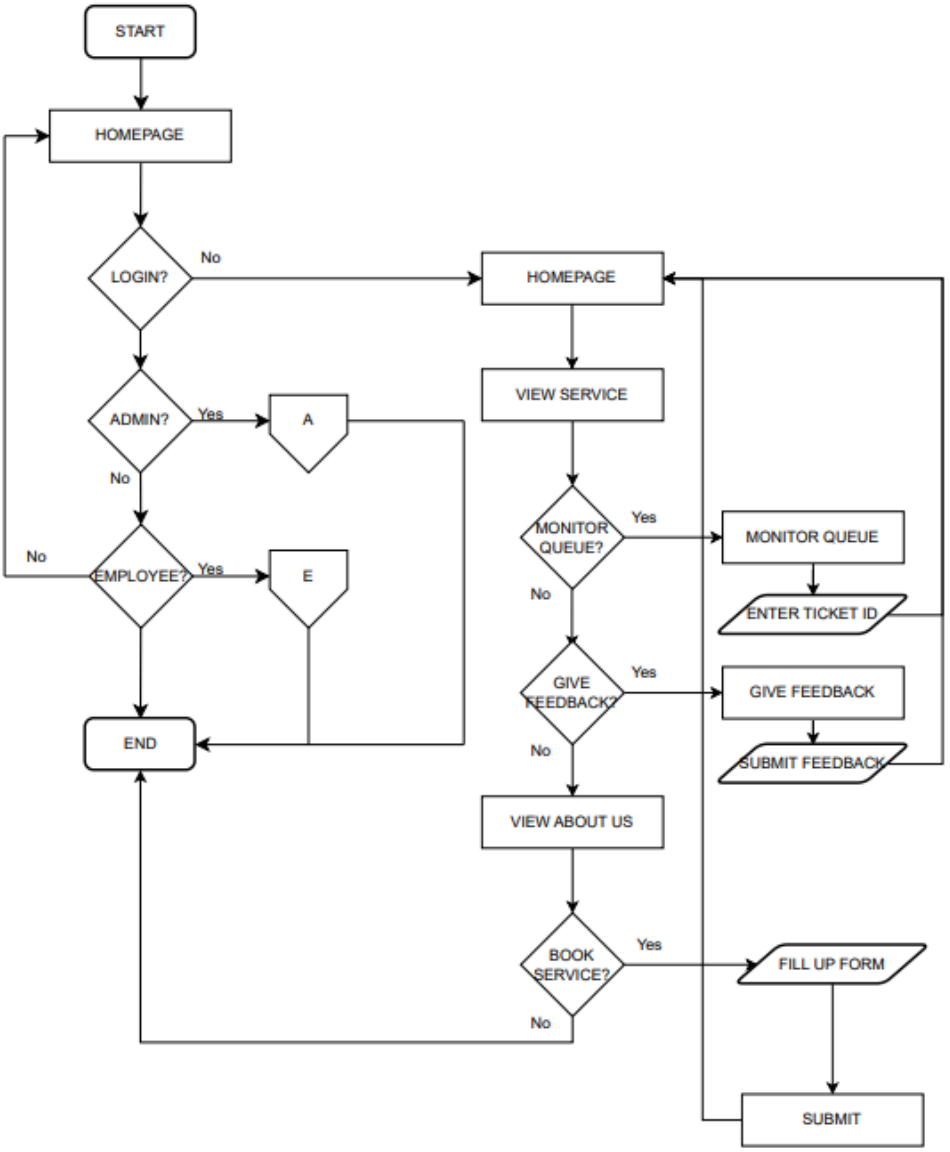
The system flowcharts present the step-by-step process of how each user interacts with the Painting Shop Management System. These diagrams visually represent the logical flow of operations from login to logout, including data entry, validation, and system output. Each flowchart illustrates the different roles,Admin, Employee, and Customer. And how their actions contribute to the overall system functionality.

Customer System Flowchart

Figure 8 illustrates the system flowchart for the Customer module, showing how users interact with the system to access services. From the homepage, customers can view available painting services, monitor their job

queue by entering a ticket ID, and provide feedback once their service is completed. They can also view information about the shop through the “About Us” section or book a new service by filling out and submitting a form. This flow ensures an easy, organized, and user-friendly experience for customers as they engage with the painting shop’s online system.

Figure 8

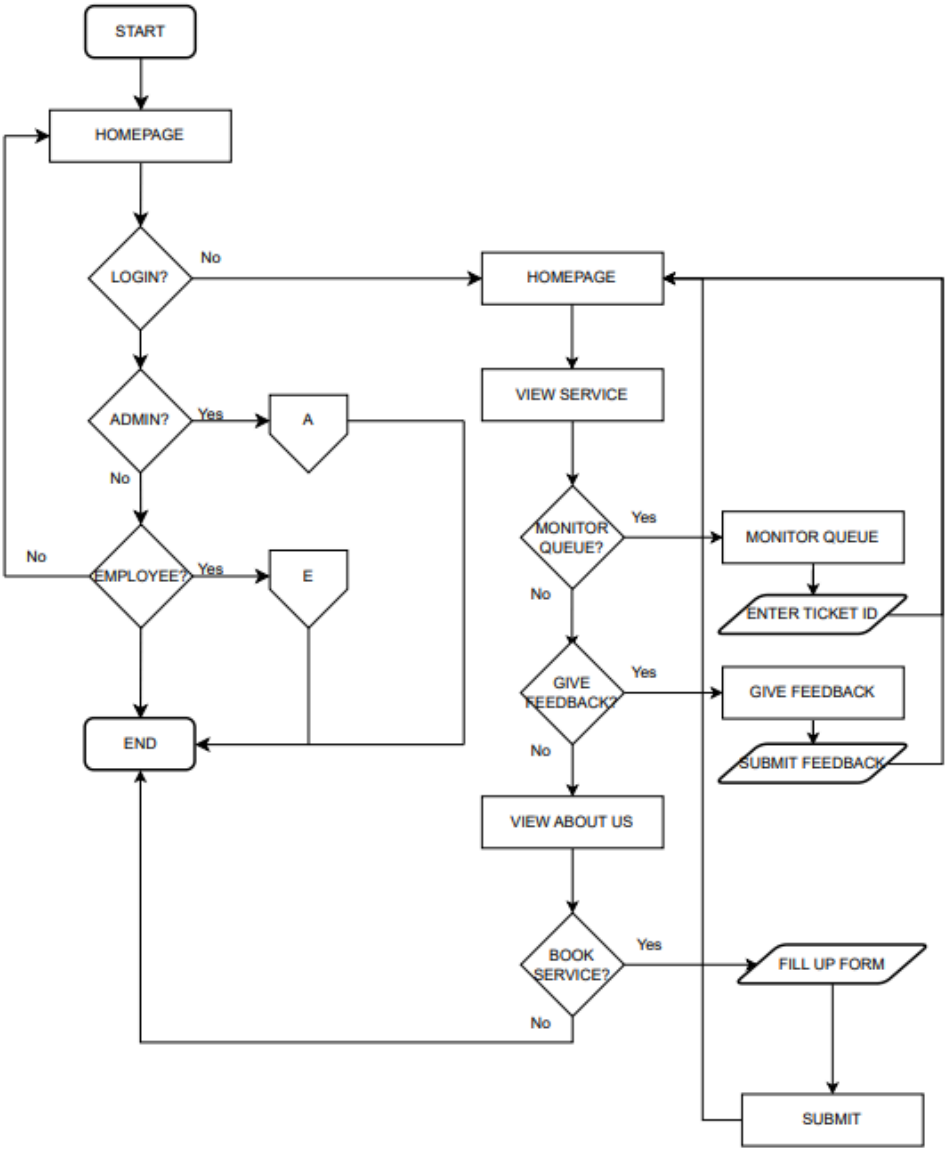


Employee System Flowchart

Figure 9 presents the system flowchart for the Employee module, illustrating how employees manage daily job operations. After logging into the system, employees can view their assigned job tickets or create new ones for customers. Each ticket includes customer details, painting specifications, and

job progress status. Employees update the system as work progresses to ensure real-time tracking on the queue monitoring page. Before beginning a painting task, they check the inventory to confirm material availability, with the system automatically updating stock records after each use. This process promotes transparency, accuracy, and accountability in managing customer jobs and shop resources.

Figure 9



Admin System Flowchart

Figure 10 & 11 presents the system flowchart for the Admin module, which outlines how administrators manage and oversee system operations. After logging in with a valid passkey, the admin gains access to the main dashboard, where they can view, edit, or delete services and offers. The admin

can also manage employee records, update job details, and monitor customer tickets. Additionally, the admin oversees inventory by viewing or editing stock details to ensure material availability. Once tasks are completed, the admin can review customer feedback and log out. This process ensures smooth system maintenance, proper record management, and efficient service monitoring within the painting shop system.

Figure 10

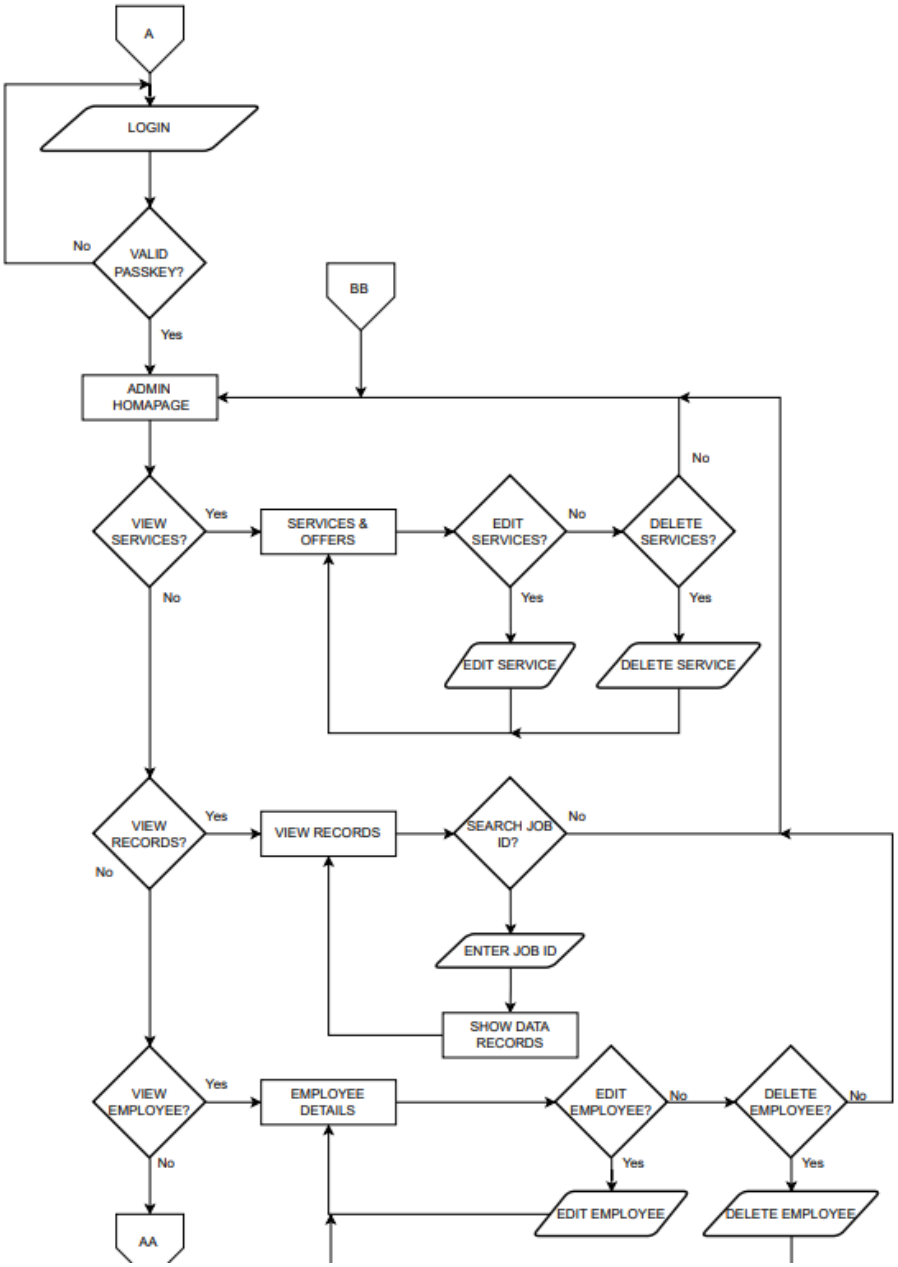
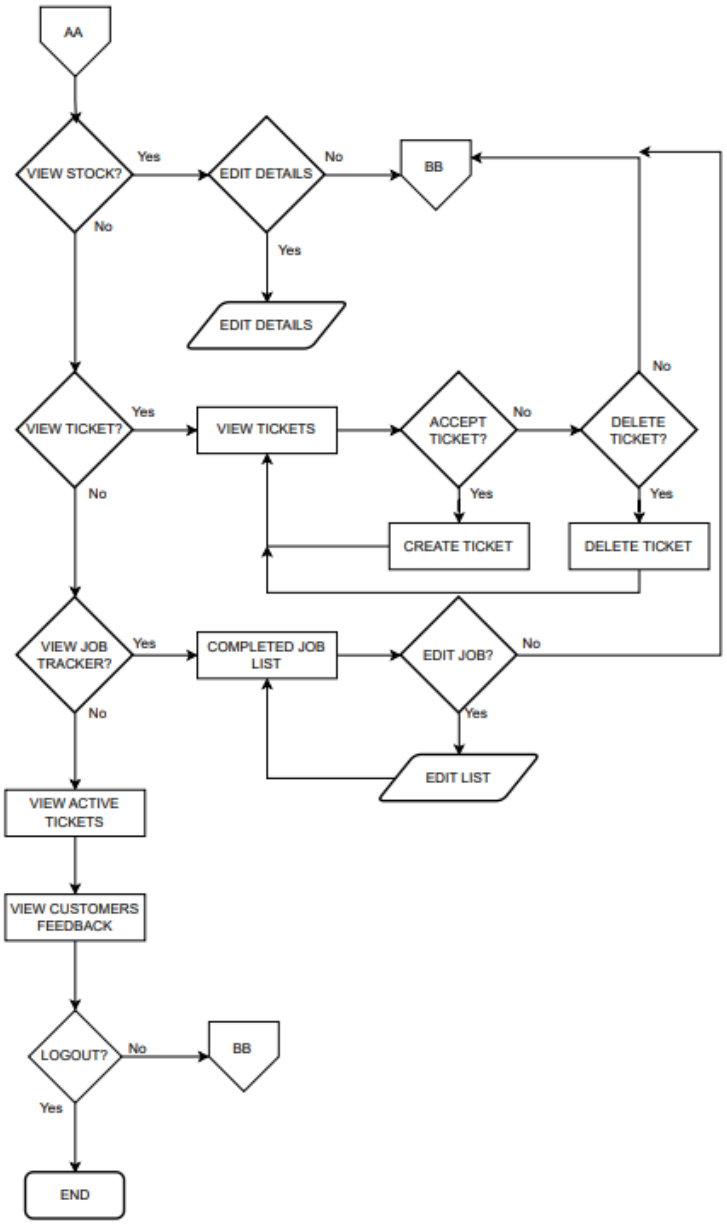

A
LOGIN
No
VALID PASSKEY?
Yes
BB
ADMIN HOMAPAGE
VIEW SERVICES?
Yes
SERVICES & OFFERS
EDIT SERVICES?
No
DELETE SERVICES?
No
Yes
Yes
EDIT SERVICE
DELETE SERVICE
No
VIEW RECORDS?
Yes
VIEW RECORDS
SEARCH JOB ID?
No
No
ENTER JOB ID
SHOW DATA RECORDS
VIEW EMPLOYEE?
Yes
EMPLOYEE DETAILS
EDIT EMPLOYEE?
No
DELETE EMPLOYEE?
No
No
Yes
Yes
EDIT EMPLOYEE
DELETE EMPLOYEE
AA

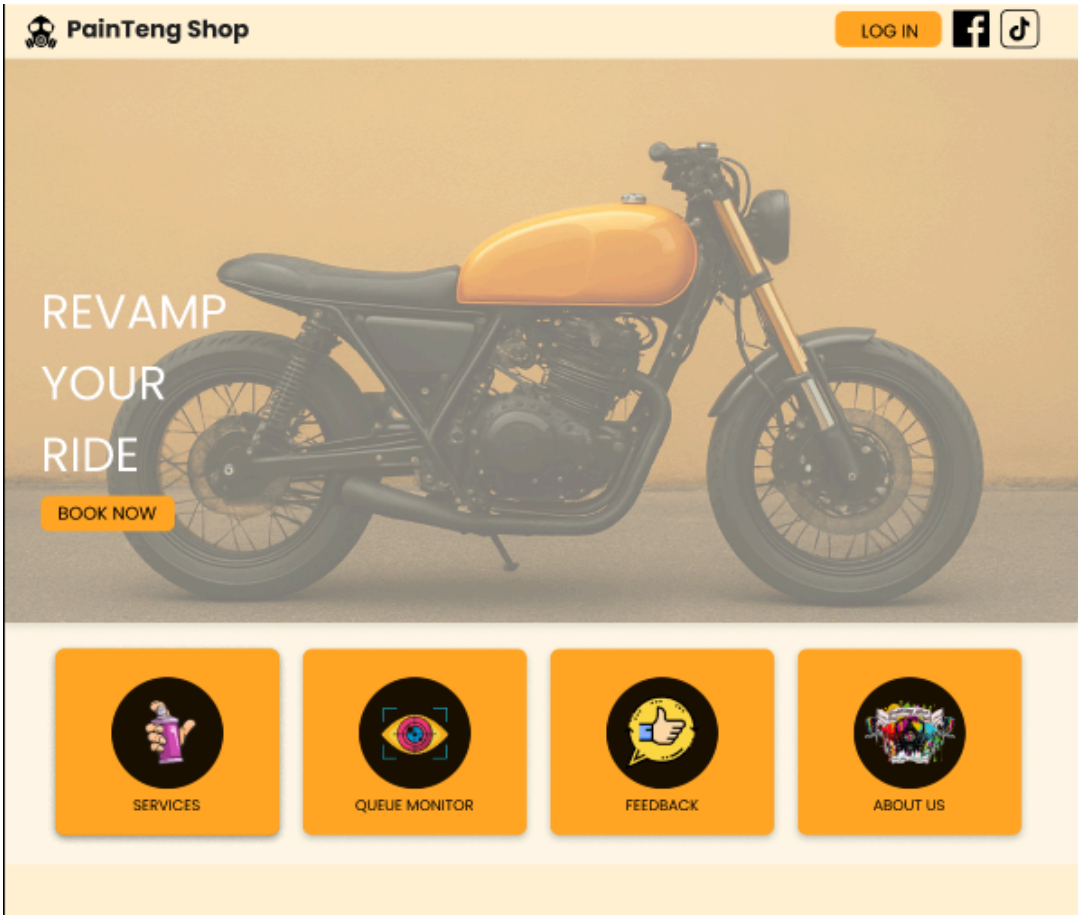
Figure 11



In summary, the system flowcharts in Figures 8 to 10 clearly depict how each user — Admin, Employee, and Customer — interacts with the Painting Shop Management System. These diagrams outline the logical flow of processes and decision points, ensuring that all user actions lead to consistent and accurate outcomes. The flowcharts also demonstrate how automation,

validation, and data synchronization contribute to a seamless operational workflow across all modules.

Prototype of the System



The Home Page serves as the main entry point of the PainTeng Shop Online System. It provides users with an overview of the system's features and navigation options. The interface highlights the shop's primary service of motorcycle painting, encouraging users to "Revamp Your Ride." From this page, users can access key modules such as Services, Queue Monitor, Feedback, and About Us. The design incorporates a simple and user-friendly layout with an orange and yellow color palette that reflects the brand's theme and identity.

The figure above is the interface for the employee's side. The PainTeng Shop System is a web-based application designed to streamline the operations of a motorcycle repair and customization shop. It provides an organized platform for managing services, customer records, repair tickets, and inventory stocks. With a user-friendly interface, the system helps improve efficiency, track transactions, and enhance customer service while supporting the shop's goal to "Revamp Your Ride."

The figure above is the Admin's interface. The PainTeng Shop System is a web-based management system developed to automate and organize the daily operations of a motorcycle repair and customization shop. It features modules for services, customer records, employee management, inventory stocks, repair tickets, job tracking, active queue monitoring, and customer feedback. The system aims to enhance operational efficiency, ensure accurate record-keeping, and provide a more convenient and transparent experience for both employees and customers.

Development Process

The development of FlowLog: Web based workflow and monitoring system for PainTeng Shop was guided by the Software Development Life Cycle

(SDLC) approach to ensure that the system was created in a structured and organized manner. The process was based on the design documents and diagrams prepared during the planning stage, including the system architecture, database schema, and user interface prototypes. Each phase of development focused on turning the design into a working, functional system that meets the project's objectives of improving job tracking, workflow management, and customer communication.

During the coding phase, the system was developed using web-based technologies. The front-end was built with HTML, CSS, JavaScript, and Bootstrap to create a responsive and user-friendly interface. The back-end used PHP (or another selected language, depending on your actual system) to handle the application logic, including user authentication, job management, inventory tracking, and reporting functions. All modules were developed separately, ensuring that each function could be tested and debugged before integration.

In the integration stage, all modules such as user login, job tracking, notification system, and inventory management were connected to work together as one system. Each feature was tested to ensure smooth data flow between the user interface, application logic, and database. Errors and inconsistencies were fixed to maintain reliability and performance. Integration also included linking automated email notifications and generating reports based on job records and customer feedback.

The database development followed the approved Entity-Relationship Diagram (ERD). Tables for Users, Jobs, Inventory, Job History, and Feedback were created using MySQL (or your chosen DBMS). Relationships between tables were properly defined through primary and foreign keys to maintain data accuracy. Query optimization and indexing were implemented to ensure fast retrieval of records and smooth system performance.

Testing

This section discusses the testing approach that will be used to ensure that the FlowLog: Web based workflow and monitoring system for PainTeng Shop functions as planned and in keeping with the project's objectives. Before the system is fully deployed as a website, testing is essential since it determines the system's effectiveness, security, and durability. Its goal is to ensure that FlowLog meets all functional and non-functional requirements established during the system's design and development stages. Integration testing is done to ensure that data flows between the database, back-end logic, and front-end interface efficiently. This stage verifies that all user actions and modifications are appropriately recorded and managed across the system. Preventing errors or discrepancies in communication between system elements is the goal. The system's speed and stability under several concurrent users are also examined in this section. To ensure that FlowLog can support actual business activities without delays, it evaluates database efficiency, system

response time, and loading speed. Compatibility testing is carried out to ensure the system functions properly across a variety of web browsers and devices. Because the Bootstrap Framework is being used, the website needs to be responsive to maintain a consistent appearance and experience across desktop, tablet, and mobile devices. Functional testing is going to be done to make sure that every system feature works correctly and efficiently. This includes basic tasks like processing and updating work tasks, emailing clients when a painting or service job is completed, and monitoring the inventory of materials. It will also test whether the role-based access control for the administrator, employee, and customer works as intended, ensuring that each user has the required level of access within the system.

Ethical Considerations

The development of FlowLog: Web based workflow and monitoring system strictly adheres to ethical, legal, and professional standards to ensure the responsible conduct of research and system implementation. All participants involved in this study, including the owner, employees, and customers of PainTeng Shop, were informed about the project's objectives, scope, and purpose prior to any form of data collection. Participation was entirely voluntary, and informed consent was obtained to guarantee that individuals understood how their data and feedback would be used to improve

the system. No sensitive or personal information was collected beyond what was necessary for the study's objectives.

Data privacy and protection were major priorities throughout the development process. All collected information, such as user accounts, job details, and feedback, was securely stored in a protected database with limited access granted only to authorized personnel. During system testing and analysis, any identifiable information was anonymized to maintain confidentiality. The project complies with the Data Privacy Act of 2012 (Republic Act No. 10173), ensuring that all personal data is processed fairly, lawfully, and only for legitimate purposes. Furthermore, the system implements security measures such as encrypted passwords, secure login protocols, and data validation to prevent unauthorized access and misuse.

In terms of academic integrity, all materials, studies, and online resources used in developing FlowLog were properly cited and acknowledged following APA citation standards. This ensures that intellectual property rights are respected and plagiarism is strictly avoided. The researchers made sure that all borrowed ideas, system designs, and literature reviews were properly referenced to maintain transparency and uphold professional ethics in research and development. Through these measures, the FlowLog project demonstrates a strong commitment to ethical responsibility, data protection, and respect for all individuals and sources involved.

CHAPTER IV

RESULTS AND DISCUSSIONS

CHAPTER V

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

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APPENDIX A

Gantt Chart

APPENDIX B

Survey Questionnaire

APPENDIX N

Curriculum Vitae