Project Report
on
CAR WASHING SERVICE

at
Spigot Infotech

Submitted in partial fulfillment of the requirement
for the award of the degree of
Bachelor of Technology
in
COMPUTER SCIENCE AND BUSINESS SYSTEMS
by

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Under the Guidance of

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CERTIFICATE

This is to certify that **Mr. Khush Makadia** student of **B.Tech. Semester VIII (Computer Science And Business Systems)** has completed his full semester project work titled "**Car Washing Service"** satisfactorily in partial fulfillment of the requirement of Bachelor of Technology degree of Computer Science and Business Systems of Ganpat University, Ganpat Vidyanagar in the year 2024-2025.

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Dr. Devang Pandya
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Stamp

Date of Examination: 10/05/2025

SpigotInfotech

CERTIFICATE OF INTERNSHIP

This Certificate is proudly presented to

Khush Makadia

In appreciation for your successful work as an intern in Web developer.

The internship was conducted between January 2025 to May 2025

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Thank you,
Khush Makadia(21012571018)

ABSTRACT

The Car Washing Service Project is designed to streamline and modernize the process of booking and managing car wash services. This system enables customers to conveniently schedule car wash appointments, select from a range of services (such as exterior wash, interior cleaning, polishing, etc.), and choose their preferred time slots. The project aims to reduce waiting times, improve service efficiency, and enhance customer satisfaction through automation and digital interaction.

For service providers, the system offers an admin panel to manage bookings, update service options, track daily workloads, and maintain customer records. Optional features like location-based service availability, online payments, and real-time status updates further enhance the user experience. The platform can be developed as a web or mobile application using technologies such as Java, PHP, Python, or modern frameworks like React or Flutter, depending on the scope and user base.

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CHAPTER 1. INTRODUCTION

In today's fast-paced world, car owners often struggle to find the time and convenience for regular vehicle cleaning and maintenance. Traditional car washing services typically involve long waiting times, lack of transparency, and inefficient service management. With the growing demand for convenience and digital solutions, there is a clear need for a modern, organized, and user-friendly system that simplifies the car washing process.

In today’s fast-paced world, vehicle ownership has become a necessity rather than a luxury. As urbanization increases and more people rely on personal transportation, the demand for car maintenance services, particularly car washing, has surged. A clean vehicle not only enhances its aesthetic appeal but also extends its lifespan by preventing rust, corrosion, and paint damage caused by dirt, pollutants, and weather elements.

This project focuses on establishing a professional Car Washing Service designed to meet the needs of modern vehicle owners by offering convenient, efficient, and environmentally friendly car cleaning solutions. Traditional methods of car washing often involve excessive water usage, harsh chemicals, and considerable time investment. This project aims to address these inefficiencies by introducing a structured service model that blends technology, skilled labor, and eco-conscious practices.

The proposed car washing service will include multiple washing packages such as exterior wash, interior cleaning, waxing, polishing, and engine bay detailing, catering to a wide range of customer preferences and vehicle types. Additionally, the integration of mobile car washing and on-demand booking via apps or websites offers customers the flexibility of service at their doorstep—eliminating the need to wait in queues or travel to washing stations.

From a business perspective, the car washing industry represents a growing and sustainable market. With increasing consumer awareness about vehicle maintenance and rising disposable income, customers are willing to pay for quality and convenience. The project also considers environmental responsibility by implementing water recycling systems, biodegradable cleaning agents, and efficient waste disposal techniques.

1.1 Project Overview:

The Car Washing Service Project is a digital solution developed to enhance and automate the car cleaning service experience for both customers and service providers. The project consists of a user-friendly platform—either web-based, mobile-based, or both—that allows customers to browse available car wash packages, schedule appointments, choose their preferred service location (on-site or doorstep), and make secure payments.

For the service provider, the system offers a backend dashboard to manage bookings, assign jobs to staff, monitor service progress, update service availability, and maintain customer records. Features such as SMS/email notifications, real-time status updates, and customer feedback modules are integrated to improve service efficiency and user satisfaction.

Overall, the Car Washing Service Project aims to bring convenience, transparency, and efficiency to the car cleaning industry through digital transformation.

1.2 Background:

In recent years, the demand for convenient and time-saving services has grown significantly, especially in urban areas where people often lead busy lifestyles. Car washing, a routine maintenance task, is no exception. Traditional car wash services often require customers to wait in long queues or physically visit service centers without any prior appointment, leading to time inefficiencies and customer dissatisfaction.

Moreover, as cities grow and vehicle ownership increases, the number of customers seeking regular car wash services is also rising. This creates a challenge for service providers to manage appointments, maintain quality, and meet customer expectations. Manual record-keeping and walk-in service models are becoming outdated and inefficient in addressing the modern consumer's needs.

1.3 Purpose of System:

The primary purpose of the Car Washing Service System is to provide a streamlined, user-friendly platform that connects customers with car wash service providers efficiently. It aims to eliminate the traditional challenges associated with manual bookings, long wait times, and unorganized service schedules by introducing a digital solution that offers real-time booking, service selection, and customer management.

The primary purpose of developing a system for a car washing service is to enhance operational efficiency, improve customer experience, and streamline business processes through automation and digital management. In traditional car wash setups, service management is often manual, which can lead to scheduling conflicts, long wait times, missed customer appointments, billing errors, and poor record-keeping. By implementing a digital system, the service provider can eliminate many of these inefficiencies. This allows for better time management, reduced human error, and more consistent service delivery, which ultimately leads to greater customer satisfaction and increased profitability.

One of the core goals of the system is automated booking and scheduling. Through an intuitive user interface, customers can view available time slots and schedule appointments based on their preferences. This minimizes waiting time and ensures a smooth workflow at the service center. From the service provider's perspective, it allows better resource allocation—assigning the right number of staff and tools per day based on bookings. Some advanced systems also include features such as reminders and notifications, which help reduce no-shows and last-minute cancellations, further stabilizing daily operations.

Another important purpose is record management and tracking. The system acts as a central database for storing information about customers, their vehicles, service history, payment records, and staff activities. Having this data readily accessible allows the business to provide personalized services, run promotions for regular customers, and identify trends in customer behavior. Additionally, the historical data can be used for analytical purposes to inform future business decisions, such as identifying peak service times or popular service packages.

For **customers**, the system offers convenience by allowing them to:

- Book car wash appointments online.
- Choose from a variety of service packages.
- Select preferred time slots and locations.
- Receive service reminders and status updates.

For **service providers**, the system helps:

- Manage bookings and customer information effectively.
- Schedule staff and allocate resources efficiently.
- Track service history, revenue, and performance metrics.
- Reduce administrative workload and human errors.

Overall, the system enhances operational efficiency, improves customer satisfaction, and creates a more organized and scalable approach to delivering car wash services in today's fast-paced, technology-driven world.

Key components of the project include:

- **Location and Operations**: Establishing a strategically located car wash center or launching a mobile unit to serve busy customers at home or work.
- **Services Offered**: Tiered packages ranging from express washes to premium detailing, with optional add-ons for customized needs.
- **Sustainability Focus**: Use of eco-friendly, water-conserving equipment and biodegradable cleaning products to minimize environmental impact.
- **Market Research**: Analysis of local demand, competition, customer preferences, and pricing models to ensure the service aligns with market needs.
- **Technology and Equipment**: Investment in high-efficiency washing systems and customer management tools for seamless booking and service delivery.
- **Staffing and Training**: Recruitment of experienced technicians and implementation of training programs to maintain high service standards.
- **Financial Planning**: Budgeting for startup costs, revenue projections, operational expenses, and profitability analysis.

CHAPTER 2. PROJECT SCOPE

2.1 Overview:

The Car Washing Service System aims to revolutionize how customers access car wash services by introducing a digital platform that simplifies booking, service management, and communication between users and service providers. The system will automate operational tasks, reduce manual errors, and enhance the customer experience by offering convenience, transparency, and service personalization.

2.2 Target Audience:

Primary Users

- Vehicle Owners (Customers): Individuals who require regular or one-time car cleaning services and prefer convenience, time-saving, and digital access.
- Car Wash Businesses (Service Providers): Independent car wash stations or chains that want to manage bookings, staff schedules, and service offerings more efficiently.

Secondary Users

- Administrators/Managers: Responsible for system maintenance, user support, and data/report monitoring.
- Fleet Managers/Corporate Clients (Future Scope): Businesses managing multiple vehicles that require scheduled maintenance services.

2.3 Functional Scope:

2.3.1 Customer Features:

- Account registration/login (with password recovery).
- Profile management (vehicle details, service preferences).
- Browse and compare service packages (e.g., Basic Wash, Interior Cleaning, Premium Polish).
- Real-time booking with calendar availability.
- Option for doorstep or in-station service.
- Secure online/offline payment.
- Booking history and service feedback.

- Real-time status updates and notifications (SMS/email/push).

2.3.2 Service Provider Features:

- Business profile and service management.
- Booking approval/confirmation panel.
- Staff and slot scheduling system.
- View customer details and history.
- Revenue and performance dashboard.
- Offer discounts, loyalty programs, or packages.

2.3.3 Admin Panel Features:

- User and provider management.
- Data analytics: total users, bookings, revenue, service performance.
- Monitor feedback and resolve complaints.
- Manage system configurations and security.

2.4 Non-Functional Requirements:

- Performance: System should handle high traffic during peak hours.
- Usability: Clean, intuitive interface for all user types.
- Scalability: Easily upgradable to support more users, services, or geographic areas.
- Security: Data encryption, secure login (e.g., OTP or 2FA), and protection against unauthorized access.

2.5 Technological Scope:

- Platform: Web-based system (with optional mobile app in future versions).
- Technologies: Frontend (HTML/CSS/JS, React or Angular), Backend (Java/PHP/Python), Database (MySQL, MongoDB).
- Hosting: Cloud-based infrastructure (AWS, Firebase, etc.).
- Payment Gateway: Razorpay, Stripe, or PayPal (optional for MVP).

2.6 Limitations (for Initial Release):

- No multilingual support.
- No AI/ML-based service recommendation system.
- No vehicle tracking or GPS-based real-time technician location.
- Limited to one city or region (can be scaled later).

2.7 Future Enhancements:

- Mobile app version (Android/iOS).
- AI-based customer behavior analysis and personalized offers.
- Chatbot for customer support and quick queries.
- Subscription model for regular service customers.
- Integration with smart home assistants (e.g., Alexa, Google Assistant).
- Fleet service management for business clients.
- Eco-friendly water usage reports and carbon footprint tracking.

2.8 Project Boundaries:

- The project will focus on a Minimum Viable Product (MVP) to validate key functionalities.
- Advanced marketing modules and real-time technician GPS tracking will be considered only in later stages.

Conclusion, the project scope for a car washing service encompasses all key activities, resources, and objectives required to establish and operate a fully functional car wash business. This includes site selection, infrastructure setup, procurement of equipment, staffing, service design, marketing, and the implementation of both operational and management systems. The scope clearly defines the range of services to be offered—such as exterior washing, interior cleaning, detailing, waxing, and possibly mobile or subscription-based options—ensuring alignment with market demand and customer expectations.

CHAPTER 3. FEASIBILITY ANALYSIS

A car washing service project aims to provide vehicle cleaning solutions to car owners, including exterior washing, interior vacuuming, detailing, and value-added services like waxing and engine cleaning. With the growing number of vehicles and increasing awareness among car owners about vehicle maintenance, a professionally run car washing service can fulfill a rising market demand. This feasibility study assesses whether such a project is viable in terms of market potential, financial outlook, operational requirements, and technical and legal considerations.

3.1 Technical Feasibility:

Setting up a car washing service requires suitable infrastructure and equipment, which depends on the scale of operations. For a stationary car wash, the location must have adequate space for vehicle queuing, washing, and drying. Necessary equipment includes high-pressure washers, vacuum cleaners, water tanks, air compressors, foam sprayers, and drying tools. For a mobile unit, a well-equipped van or truck with portable systems is required. Water supply, drainage systems, and waste management are key technical factors, especially to comply with local environmental regulations. Staff must be trained in handling equipment, customer service, and detailing techniques. Technology integration, such as mobile app booking or loyalty programs, adds value and operational efficiency.

This study evaluates whether the required technology, tools, and expertise are available to implement the system.

- Technology Availability: The system can be developed using widely available technologies such as HTML, CSS, JavaScript (React/Angular), Java or Python for backend, and MySQL/MongoDB for databases.
- Development Tools: Free and open-source tools (e.g., VS Code, GitHub, XAMPP) reduce dependency on costly software.
- Hosting: Cloud hosting (e.g., Firebase, AWS) provides scalable, reliable deployment.

Conclusion: Technically feasible with current resources and expertise.

3.2 Economic Feasibility:

The economic feasibility of launching a car washing service is promising, particularly in urban and semi-urban areas where car ownership is high, and consumers increasingly value convenience and time-saving services. The startup capital required for a standard hand or automatic car wash setup is relatively moderate when compared to other service-oriented businesses. Initial costs include land or rental space, water supply and storage, power supply, equipment (such as pressure washers, vacuum cleaners, air compressors, and dryers), detergents and cleaning agents, and labor. For a medium-scale project, total startup costs can range from $15,000 to $50,000 depending on the level of automation and location. Mobile car washing services may require even lower capital, as they eliminate the need for fixed infrastructure.

This section assesses whether the project is financially viable.

- Initial Development Cost:
    - Software Development: ₹50,000 – ₹1,00,000 (if outsourced)
    - Hosting & Domain: ₹3,000 – ₹10,000 per year
    - Optional Costs: Payment gateway fees, SMS API, mobile app (if planned)
- Return on Investment (ROI):
    - Revenue through commission per booking, subscription model, or ads.
    - Cost savings through reduced administrative overhead and manual errors.
- Break-even Analysis: The system could reach break-even within 6–12 months depending on adoption and scale.

Conclusion: Economically viable for small to mid-scale implementation with potential for scalability and profit.

3.3 Operational Feasibility:

An operational feasibility study assesses whether the proposed car washing service can function effectively within the intended environment and fulfill customer needs while operating smoothly on a day-to-day basis. This involves evaluating staffing, equipment, workflow, location suitability, service efficiency, and the ability to deliver consistent

quality. For a car wash business, operational feasibility is particularly crucial because it directly impacts customer satisfaction, turnaround time, and repeat patronage.

Begin with, one of the core aspects of operational feasibility for a car washing service is the location and accessibility of the facility. A car wash business must be strategically positioned in an area with high vehicle traffic—such as near malls, office complexes, gas stations, or residential neighborhoods—to ensure a steady flow of customers. The location should also allow for smooth ingress and egress, enabling vehicles to move in and out without causing congestion.

This part examines whether the system can function effectively in the real-world environment.

- User Adoption: Vehicle owners prefer digital services; a clean UI and mobile support improve usability.
- Business Readiness: Many car wash centers lack automation, making them ideal adopters of such systems.
- Ease of Use: The system will be designed to be intuitive for both customers and service providers, with simple booking and management flows.

Conclusion: Operationally feasible and aligns with current user behavior trends.

3.4 Legal Feasibility:

Before launching a car washing service, it is essential to examine the legal feasibility to ensure that the business operates within the bounds of the law. Legal feasibility refers to the assessment of whether a proposed business activity is compliant with existing laws, regulations, and licensing requirements. This involves analyzing local, regional, and national legal frameworks that govern environmental safety, labor, health, zoning, and consumer protection laws. Failing to address legal considerations can result in fines, penalties, or even forced shutdowns, making this a critical component of the overall feasibility study.

Evaluates whether the system complies with relevant laws and regulations.

- Data Privacy: System must comply with data protection laws (e.g., India's DPDP Act or GDPR if applicable).
- Payment Security: If online payment is included, PCI-DSS compliance is required.
- Terms & Conditions/Disclaimers: Needed to limit legal liabilities in case of service issues.

Conclusion: Legally feasible with proper compliance implementation.

3.5 Schedule Feasibility:

A schedule feasibility study assesses whether a proposed project can be completed within a reasonable and predefined timeframe, considering all factors such as resources, dependencies, external factors, and task durations. For a car washing service project, schedule feasibility plays a vital role in ensuring that the business can be launched on time and begin operations efficiently.

The first stage of the timeline involves the planning and research phase, which typically takes 2 to 4 weeks. During this time, the business plan is finalized, the target market is analyzed, and funding sources are identified. Next comes site selection and lease negotiations, which may require 3 to 6 weeks depending on location availability and negotiation processes.

Assesses if the system can be developed and deployed within a reasonable time frame.

- Estimated Timeline:
    - Requirement Analysis: 1–2 weeks
    - Design & Prototyping: 2–3 weeks
    - Development (MVP): 6–8 weeks
    - Testing & Deployment: 2–3 weeks
- Total Time Estimate: Approximately 3 to 4 months for a functional MVP.

Conclusion: Schedule is realistic and feasible for a student or startup-level project.

3.6 Risk Analysis

Establishing a car washing service, while seemingly straightforward, involves a range of risks that must be carefully evaluated during the feasibility study phase. Understanding these risks helps investors and entrepreneurs make informed decisions and prepare adequate mitigation strategies. The following paragraphs delve into the major risk categories: financial, operational, environmental, legal, and market-related.

- **Seasonality**: Demand for car washing services may fluctuate with the seasons. For example, demand might be higher in summer and lower in winter.
- **Economic Downturn**: Economic factors could impact discretionary spending on non-essential services like car washing.
- **Competitor Risks**: Increased competition in the area, new entrants, or changing customer preferences could impact market share.
- **Regulatory Risks**: Changes in environmental laws or water usage regulations could affect operations.

3.7 Overall Conclusion:

The feasibility analysis indicates that a car washing service project has strong potential for success, provided there is careful planning and execution. Market demand, especially in urban and suburban areas, supports sustainable growth. While initial investment is moderate, the return on investment can be promising with effective marketing, quality service delivery, and customer retention strategies. Technical setup and legal compliance are manageable, especially if sustainability practices are integrated from the outset. With a clear business plan, strong customer focus, and adaptability, the car washing business can thrive in a competitive market.

Based on the above feasibility studies, the Car Washing Service System is:

- Technically sound
- Economically sustainable
- Operationally efficient

CHAPTER 4: SOFTWARE AND HARDWARE REQUIREMENTS

4.1 Software Requirements

In today's technology-driven environment, software plays a critical role in the operational efficiency and customer experience of a car washing service. The primary requirement is a Car Wash Management System (CWMS), which centralizes business operations such as booking, billing, customer management, and employee scheduling. This system should include a point-of-sale (POS) module for processing payments—both online and on-site—integrated with various payment gateways to allow credit/debit card, mobile wallet, and contactless payments. A customer relationship management (CRM) feature is essential for maintaining customer profiles, tracking visit frequency, offering loyalty programs, and sending promotional messages via SMS or email. Additionally, a booking and scheduling module is needed, particularly for mobile or appointment-based services, allowing customers to schedule services through a website or mobile app.

4.1.1 Development Environment

Server-Side:

- Operating System: Windows Server/Linux (Ubuntu/CentOS recommended)
- Web Server: Apache 2.4+ or Nginx 1.18+
- PHP Version: 8.0 or higher (8.2 recommended for latest features)
- Database: MySQL 5.7+ or MariaDB 10.3+
- PHP Extensions:
- PDO (for database access)
- OpenSSL (for secure connections)
- URL (for API integrations)
- mbstring (for string operations)
- GD (for image processing if needed)
- ZIP (for backup functionality)Client-Side:
- Browsers: Latest versions of Chrome, Firefox, Edge, Safari
- JavaScript: ES6+ compatible browsers
- Responsive Design: Support for mobile devices (iOS/Android)

4.1.2 Development Tools:

- Code Editor: VS Code, PHPStorm, or Sublime Text
- Version Control: Git (with GitHub/GitLab/Bitbucket)
- Package Manager: Composer (for PHP dependencies)
- Debugging Tools: Xdebug for PHP debugging
- Local Development: XAMPP/WAMP/MAMP or Docker containers

4.1.3 Third-Party Integrations:

- Payment Gateways: Stripe/PayPal SDKs for PHP
- Email Services: PHPMailer or SendGrid API
- SMS Services: Twilio API (for appointment reminders)
- Maps API: Google Maps API (for location services)

4.2. Hardware Requirements:

Establishing a car washing service involves a range of hardware components, each essential to delivering efficient, safe, and high-quality cleaning services. The hardware requirements largely depend on the type of car wash—manual, automated, or mobile—but some core elements remain common across all models. At the heart of any setup is the high-pressure washer, which is used to remove dirt and grime effectively. These machines should be industrial-grade, typically offering adjustable pressure and temperature settings for versatility across vehicle types. For automatic car washes, more advanced systems like conveyor belts, robotic arms, and touchless wash arches are required, which involve significant upfront investment and space. These systems also include rollers, foam applicators, and high-velocity dryers, all of which require precise calibration and regular maintenance.

4.2.1 Development Hardware:

- Processor: Intel Core i5 or equivalent (minimum)
- RAM: 8GB (16GB recommended for smoother development)
- Storage: SSD with at least 256GB free space
- Internet Connection: Stable broadband connection for API calls and updates

4.2.2 Production Server Requirements:

For Small-Medium Business (Up to 50 daily bookings):

- Server Type: Virtual Private Server (VPS) or Cloud Instance
- CPU: 2 vCPUs (minimum)
- RAM: 4GB (8GB recommended)
- Storage: 50GB SSD (with regular backups)
- Bandwidth: 2TB monthly transfer (adjust based on traffic)

For Larger Operations (50+ daily bookings):

- Server Type: Dedicated Server or Cloud Cluster
- CPU: 4 vCPUs or more
- RAM: 16GB or more
- Storage: 100GB+ SSD with RAID configuration
- Bandwidth: 5TB+ monthly transfer

4.2.3 Additional Hardware Considerations:

- Backup Solution: External storage or cloud backup services
- Security: SSL certificate (Let's Encrypt or commercial)
- Monitoring: Server monitoring tools (New Relic, Datadog)

In conclusion, the successful operation of a car washing service relies on a well-integrated combination of both hardware and software components. On the hardware side, essential tools such as high-pressure washers, vacuum systems, water storage and recycling units, and detailing equipment form the backbone of service delivery. For larger or automated setups, more complex machinery like conveyor systems, dryers, and robotic washers are needed, requiring substantial investment and space. Power supply systems, point-of-sale devices, and security cameras round out the operational and administrative hardware needs.

CHAPTER 5: PROCESS MODEL

The Waterfall Model (or optionally the Agile Model) is commonly used in software development for projects like a car washing service system. Below is an explanation of the Waterfall Model, which is well-suited for projects with clear, well-defined requirements—like many student or small business projects.

5.1 Phases of the Waterfall Model

5.1.1 Requirement Gathering and Analysis:

- Collect detailed information about the system: user roles (admin, mechanic, customer), features (booking, service tracking, billing), and workflow.
- Identify both functional and non-functional requirements.

5.1.2 System Design:

- Design the architecture of the system.
- Define UI/UX layouts, database schemas, and overall system flow.
- Prepare system diagrams like DFDs, ER diagrams, and flowcharts.

5.1.3 Implementation (Coding):

- Front-end and back-end components are developed based on the design.
- Developers build modules such as:
- Customer login and service booking
- Admin dashboard for managing bookings and staff
- Mechanic module for task tracking
- Payment and invoice generation system

5.1.4 Testing:

- Perform unit testing, integration testing, and system testing.
- Ensure that all modules work as expected and meet the requirements.
- Fix any bugs or issues found during testing.

5.1.5 Deployment:

- Deploy the project to a web server or hosting platform.
- For mobile apps, upload to the Google Play Store / Apple App Store if applicable.
- Configure the domain name, hosting, and backups.

5.1.6 Maintenance:

- Fix any post-deployment bugs.
- Make system updates based on user feedback.
- Add new features or improvements as needed.

5.1.7 Customer Engagement & Booking:

- **Walk-in / Online / Phone Booking:** Customers book the service through walk-ins, a website/app, or phone.
- **Service Selection:** Customer chooses a service package (e.g., Basic Wash, Full Wash, Interior Detailing, etc.).
- **Scheduling:** Appointment is scheduled based on availability and customer preference.
- **Customer Information Collection:** Vehicle details, contact info, and special requests are recorded.

5.1.8 Vehicle Inspection & Pre-Wash Preparation:

- **Initial Inspection:** Visual inspection of the car to note pre-existing damages or areas needing extra care.
- **Checklist Completion:** Checklist filled (interior/exterior conditions, valuables inside, etc.).
- **Customer Approval:** Customer signs off on inspection record.
- **Pre-Wash Setup:** Remove accessories, close all windows, and prepare equipment/supplies.

5.2 Car Washing Process:

5.2.1 Exterior Wash:

- Rinse car to remove loose dirt
- Apply car shampoo/foam
- Manual or automated brushing/scrubbing
- Rinse and remove soap
- Dry with microfiber towels or air dryer

5.2.2 Interior Cleaning:

- Remove mats and vacuum floors/seats
- Clean dashboard, console, and cup holders
- Interior glass and window cleaning
- Optional: Leather treatment, fabric shampooing, odor removal

5.2.3 Add-on Services (if selected):

- Waxing and polishing
- Engine cleaning
- Tire and rim detailing
- Undercarriage wash
- Ceramic coating or sealant

5.2.4 Final Inspection & Quality Check:

- Team lead or supervisor inspects work against checklist
- Check for missed spots, streaks, or customer complaints
- Perform touch-ups if needed
- Verify add-ons were completed

5.2.5 Customer Handover:

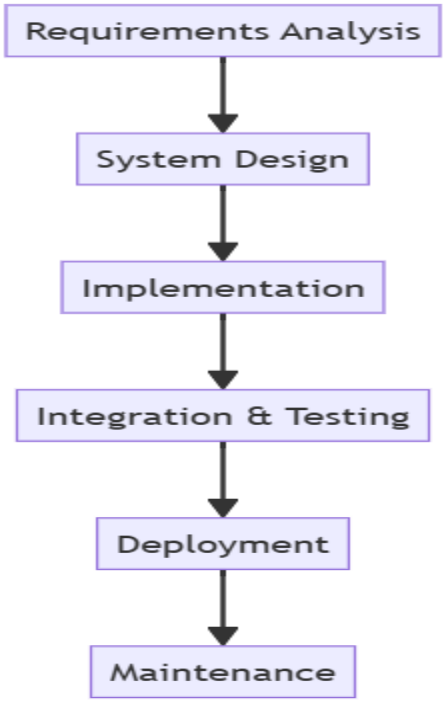
- Present the car to the customer
- Walkthrough of work done (especially if detailing)
- Address any concerns

5.2.6 Payment & Billing:

- Generate invoice (manual or POS system)
- Accept payment (cash, card, digital wallet)
- Offer loyalty points, referral discounts if applicable

5.2.7 Post-Service & Follow-Up:

- Send thank-you message or digital receipt
- Request feedback or Google review
- Offer next service reminder or discount coupon
- Store service history for return visits



Figuer 5.1: Waterfall Model

The Waterfall Model is a sequential development process that is often used in software development but can also be applied to service-based projects like a car washing service. This model is characterized by distinct phases, where each phase depends on the output of the previous one, and no phase can start until the previous phase is completed.

CHAPTER 6: PROJECT PLAN

Here's a complete and clean Project Plan for a Car Washing Service Project — perfect for inclusion in a report, presentation, or proposal. This plan outlines the phases, tasks, timeline, and responsibilities typically involved in delivering such a project.

6.1 Project Title:

Car Washing Service Management System

6.2 Project Objectives:

- To create a user-friendly system for booking and managing car wash services.
- To streamline workshop operations including service tracking, billing, and inventory.
- To improve customer experience and service efficiency.

6.3 Team Roles and Responsibilities:

Table 6.1: Team Roles and Responsibilities

Role	Responsibilities
Project Manager	Oversee the entire project, schedule, and deliverables
Business Analyst	Gather and document requirements
UI/UX Designer	Design user interfaces and user experience flows
Front-End Developer	Build web/mobile interface for users
Tester/QA Engineer	Test functionalities and fix bugs
Deployment Engineer	Handle deployment, hosting, and live setup

This table outlines the key roles involved in a software development project along with their specific responsibilities. The Project Manager is responsible for overseeing the entire project, including the schedule and deliverables. The Business Analyst gathers and documents requirements from stakeholders. The UI/UX Designer focuses on designing

user interfaces and mapping out user experience flows. The Front-End Developer builds the web or mobile interface that users interact with. The Tester/QA Engineer is tasked with testing the system's functionalities and identifying and fixing bugs. Lastly, the Deployment Engineer handles the deployment process, including hosting and setting up the live environment.

6.4 Timeline:

Table 6.2: Timeline

Phase	Duration	Start Date	End Date
Requirement Gathering	2 weeks	Day 1	Day 14
System Design	2 weeks	Day 15	Day 28
Front-End Development	3 weeks	Day 29	Day 49
Integration & Feature Completion	4 weeks	Day 50	Day 78
Testing Phase	Full Project	Day 50	Day 100+
Deployment	2 weeks	Day 79	Day 93
Final Review & Documentation	1 week	Day 94	Day 100

This table presents a project timeline broken into phases with their duration and corresponding start and end dates. The Requirement Gathering phase spans 2 weeks from Day 1 to Day 14. The System Design phase follows, lasting another 2 weeks from Day 15 to Day 28. Front-End Development takes 3 weeks, running from Day 29 to Day 49. The Integration & Feature Completion phase spans 4 weeks, from Day 50 to Day 78. The Testing Phase is ongoing throughout the full project, starting from Day 50 and continuing beyond Day 100. Deployment lasts 2 weeks from Day 79 to Day 93. Finally, Final Review & Documentation is completed in the last week, from Day 94 to Day 100.

6.5 Tools and Technologies:

- **Frontend:** HTML, CSS, JavaScript, React or Angular
- **Backend:** Node.js / PHP / Python (e.g., Django)
- **Database:** MySQL / Firebase
- **Hosting:** AWS / Heroku / Shared Hosting
- **Design:** Figma / Adobe XD
- **Version Control:** Git + GitHub

6.6 Deliverables:

- Functional Web/Mobile Application
- Admin Panel for Managing Services
- User Interface for Bookings & Feedback
- Billing & Payment Module
- Database with Service History

6.7 Success Criteria:

- System is delivered on time and within scope
- All modules work as intended

6.8 Expected Outcomes

- Reduction in washing time and water wastage
- Consistent service quality
- Higher customer satisfaction
- Scalable business model

6.9 Sustainability Features (Optional)

- Water recycling unit (filters, sedimentation tanks)
- Use of biodegradable soaps
- Rainwater harvesting system
- Solar-powered pumps or lights

6.10 Marketing Plan

- Website and mobile app with online booking
- Google My Business listing
- Social media ads (Facebook, Instagram)
- Local partnerships (with parking lots, malls)
- Launch promotions (discounts, loyalty cards)

6.11 Scope of the Project

- Manual, semi-automatic, or fully automatic car wash system.
- Service station setup or mobile car wash units.
- Optional features: online booking system, IoT-enabled monitoring, water recycling.

CHAPTER 7: SYSTEM DESIGN

7.1 Use Case Diagram:

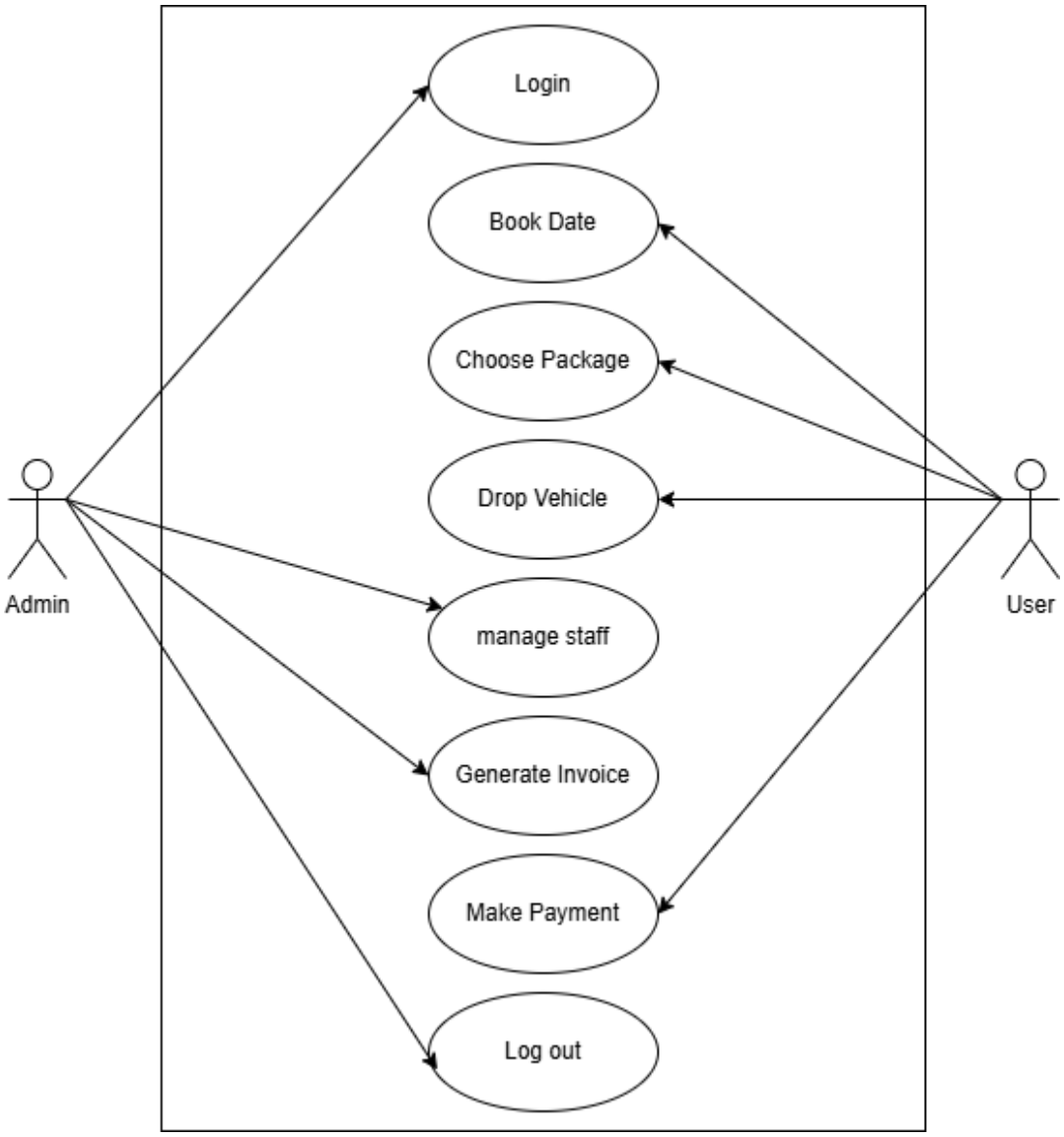


Figure 7.1: Use Case Diagram

The image represents a Use Case Diagram for a vehicle service management system, illustrating the interactions between two primary actors—Admin and User—with the system's functionalities. Both Admin and User can perform common actions such as logging in and logging out of the system. The User is able to book service dates, choose service packages, drop off vehicles, and make payments, reflecting a typical customer workflow in a service booking system. On

the other hand, the Admin is responsible for more operational and administrative tasks such as managing staff and generating invoices.

7.2 Class Diagram:

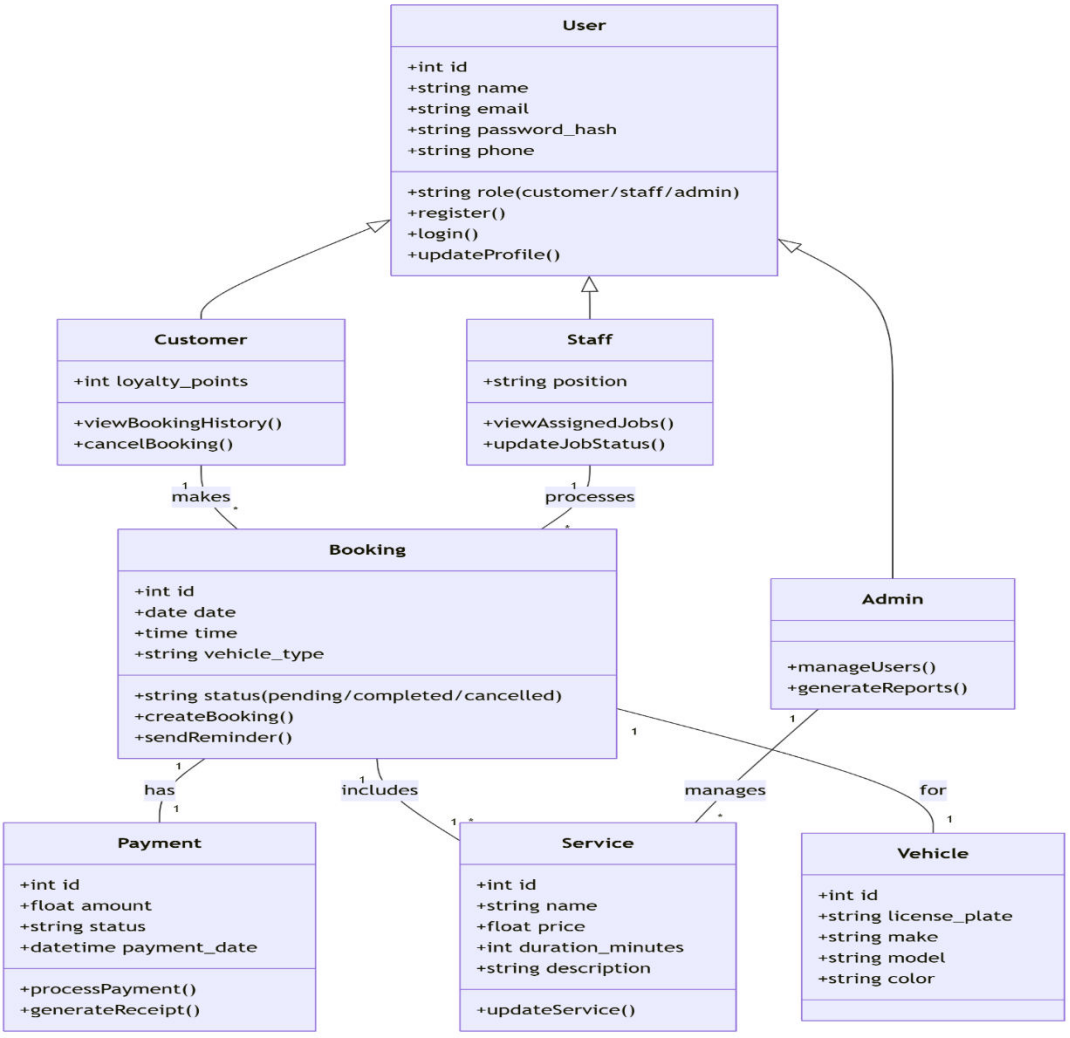


Figure 7.2: Class Diagram

The image represents a Class Diagram for a vehicle service management system, showcasing the structure of the system in terms of classes, their attributes, methods, and relationships. At the core is the User class, which includes attributes such as ID, name, email, password hash, and phone number, along with common methods like register, login, and updateProfile. The User class is inherited by three specialized classes—Customer,

Staff, and Admin. Customers have additional attributes like loyalty points and can view or cancel bookings. Staff members have a position attribute and can view and update job statuses. Admins are responsible for managing users and generating reports.

7.3 Activity Diagram:

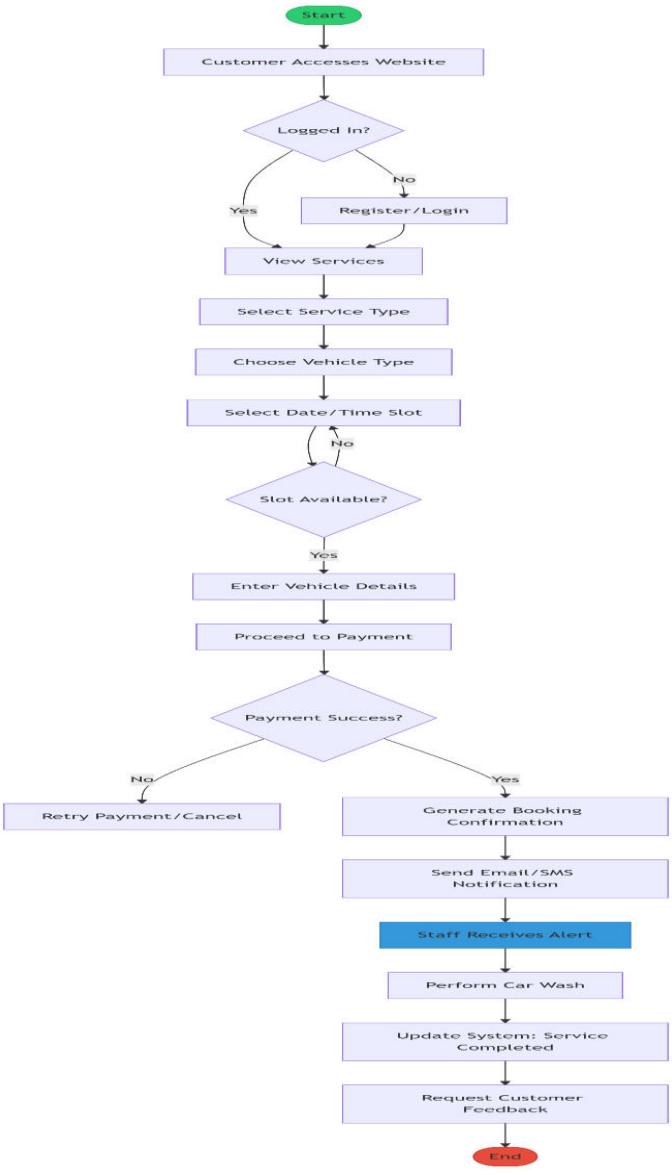


Figure 7.3: Activity Diagram

The image depicts a Flowchart representing the end-to-end process of a customer booking a car wash service through a website. The process begins when a customer accesses the

website. If the customer is not logged in, they are prompted to register or log in. Once authenticated, the customer can view available services and proceed to select the desired service type and vehicle type. They then choose a suitable date and time slot. The system checks the availability of the selected slot; if unavailable, the customer must choose a different one.

7.4 Sequence Diagram:

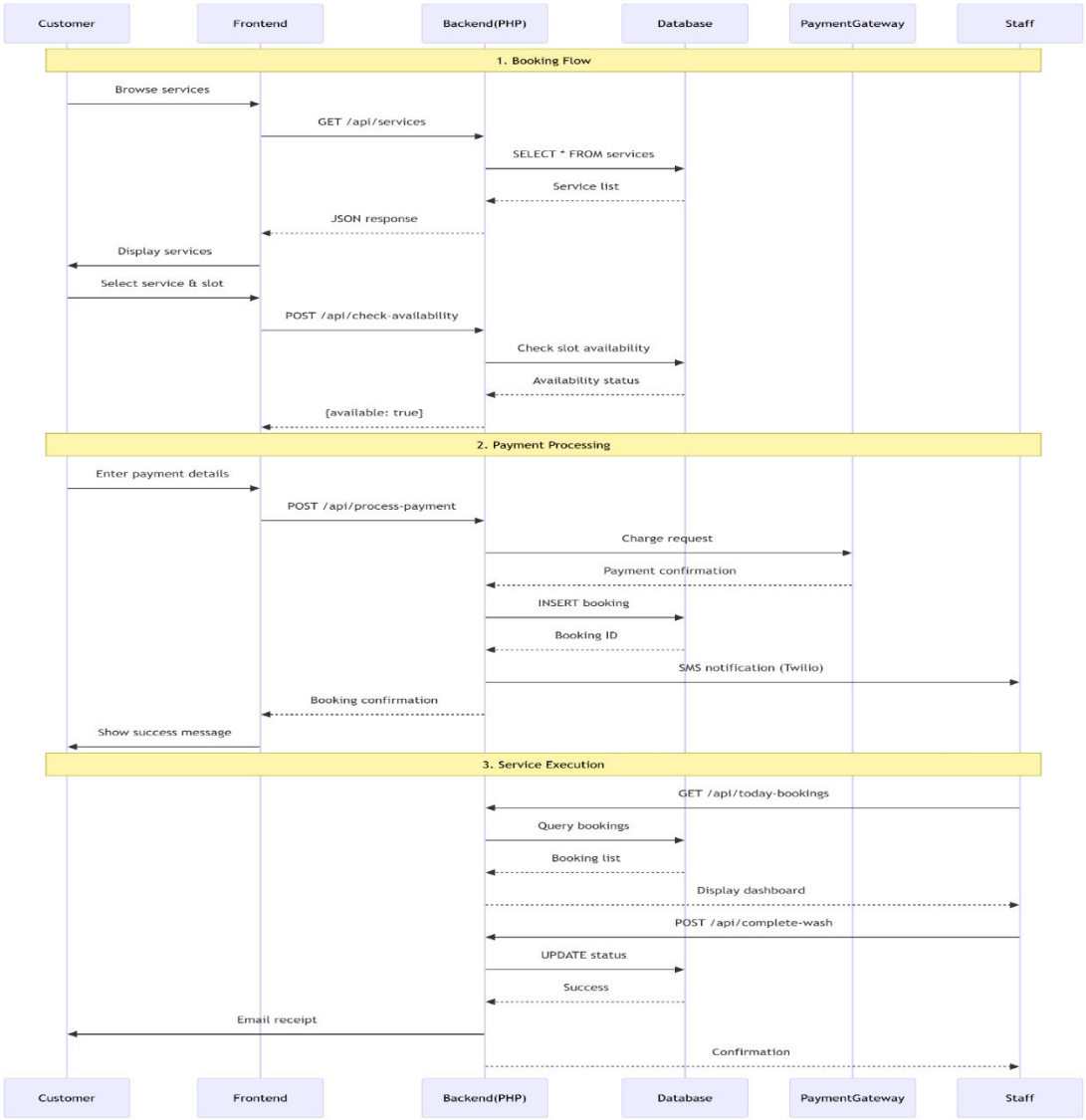


Figure 7.4: Sequence Diagram

The image is a Sequence Diagram that illustrates the detailed interaction among different components of a car wash booking system, divided into three main phases: Booking Flow, Payment Processing, and Service Execution. The components involved include the Customer, Frontend, Backend (PHP), Database, Payment Gateway, and Staff.

7.5 DFD Diagram:

7.5.1 DFD Level-0 Diagram:

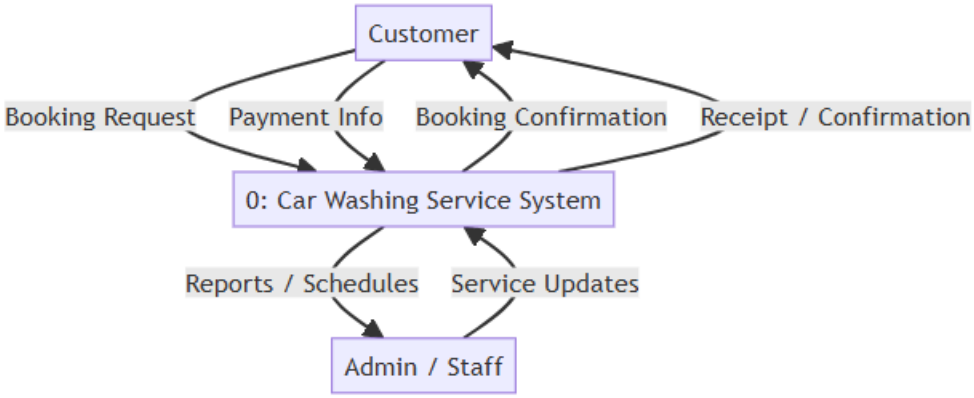


Figure 7.5: DFD Level-0 Diagram

The image represents a Level-0 Data Flow Diagram (DFD) for a Car Washing Service System, which provides a high-level overview of how data flows between external entities and the main system. At the center is the car washing service system (process 0), which interacts with two primary external entities: Customer and Admin/Staff.

Customers initiate interactions with the system by sending Booking Requests and Payment Information. In response, the system processes these requests and sends back Booking Confirmations and Receipts/Confirmations to the customer, confirming successful transactions and service scheduling. Simultaneously, the system provides Reports and Schedules to Admin/Staff, helping them manage and

organize service operations. The Admin/Staff also send Service Updates back into the system, indicating the progress or completion of service tasks.

7.5.2 DFD Level-1 Diagram:

A Level-1 Data Flow Diagram (DFD) provides a more detailed breakdown of the main process shown in the Level-0 DFD—in this case, the Car Washing Service System. It decomposes the system into multiple sub-processes to illustrate how each function works internally and how data moves between these functions, external entities, and data stores.

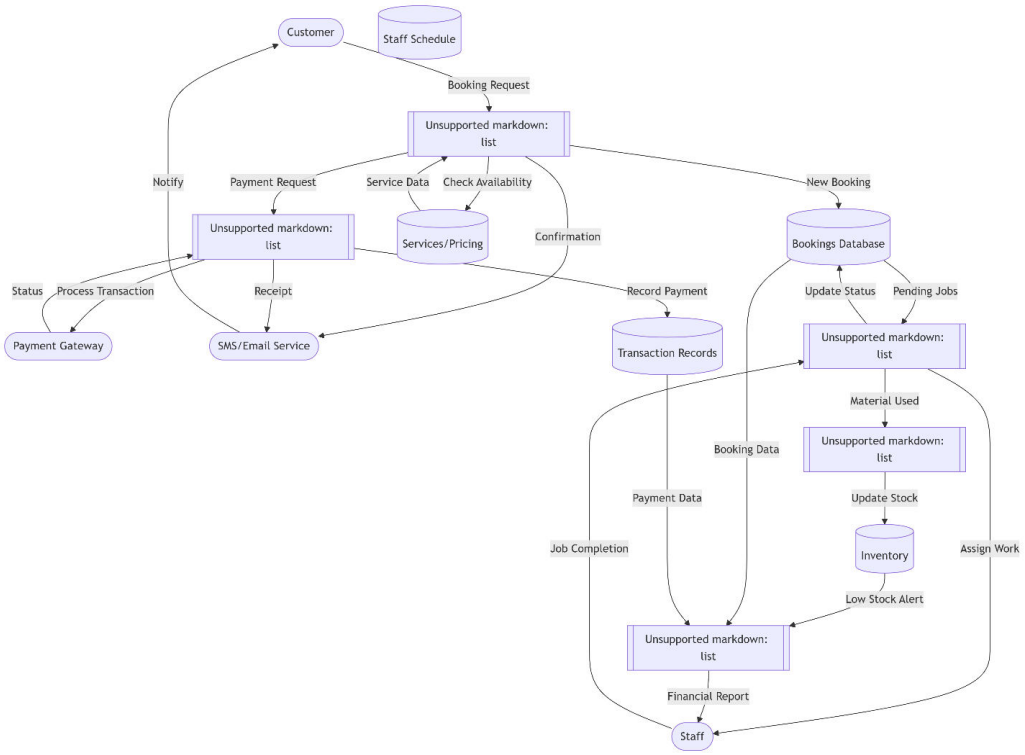


Figure 7.6: DFD Level-1 Diagram

The Level-1 Data Flow Diagram (DFD) of the Car Washing Service System shown in the image expands on the core functionalities presented in the Level-0 DFD by detailing the internal processes and data stores involved in handling customer bookings, payments, and service execution. The diagram begins with a Customer initiating a Booking Request, which is checked for availability through the

Services/Pricing process. Once availability is confirmed, the system records the booking in the Booking Database and updates job statuses accordingly.

7.5.3 DFD Level-2 Diagram:

A Level-2 Data Flow Diagram (DFD) provides a detailed decomposition of one or more processes identified in the Level-1 DFD, breaking them down into more specific sub-processes to show the internal flow of data within a particular function of the system. In the context of a Car Washing Service System, a Level-2 DFD typically focuses on one major process—such as "Booking Management", "Payment Handling", or "Service Execution"—and further elaborates on its internal activities, data stores, and interactions with external entities.

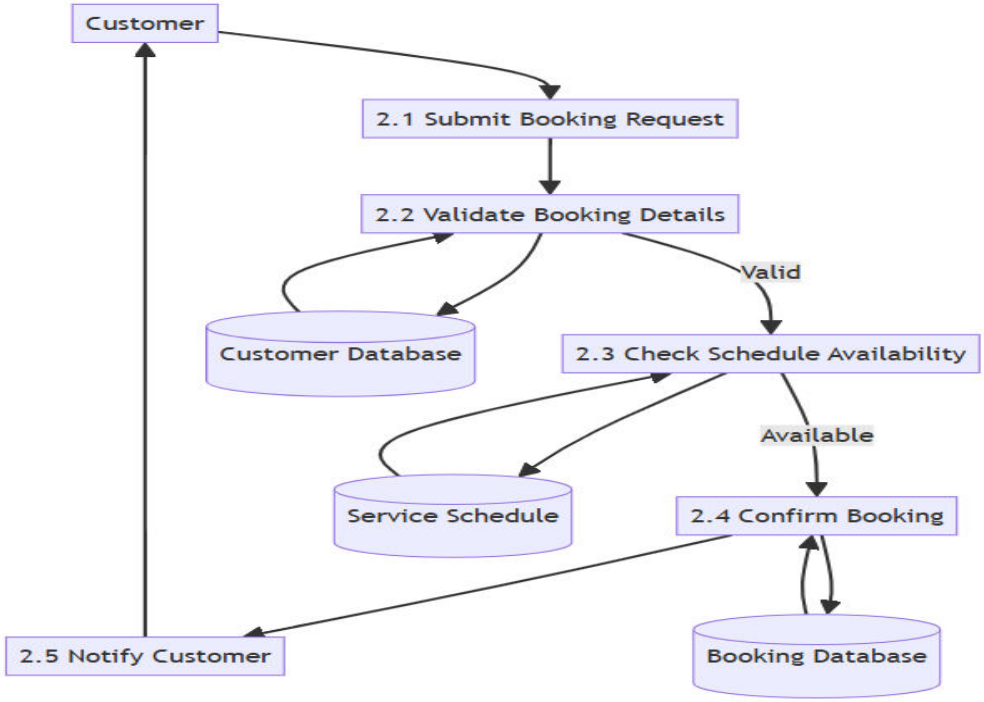


Figure 7.7: DFD Level-2 Diagram

The image represents a Level-2 Data Flow Diagram (DFD) for the Booking Process of a Car Washing Service System. It breaks down the major booking functionality into detailed sub-processes, clearly illustrating the internal data flows and system interactions required to manage a booking request. The process begins when the Customer submits a booking request (Process 2.1).

CHAPTER 8: IMPLEMENTATION DETAILS

8.1 Flow Chart:

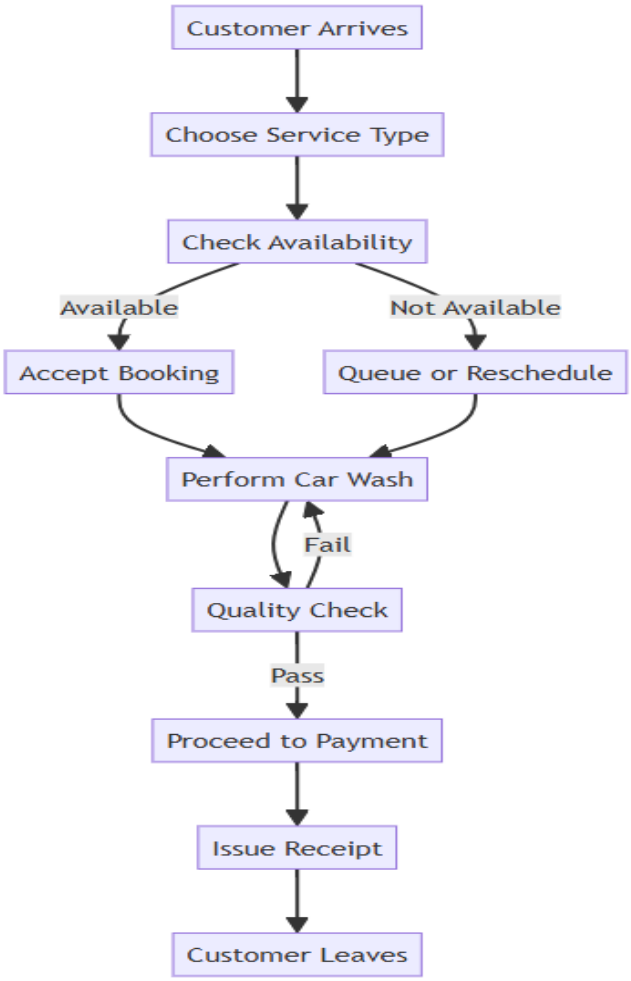


Figure 8.1: Flow Chart Diagram

The flowchart illustrates the customer journey and service process for a car washing system, detailing each step from arrival to departure. The process begins when the customer arrives and chooses a service type. The system then checks availability of the requested service. If the service is available, the system accepts the booking and moves forward. If not, the customer is placed in a queue or offered a rescheduling option. Once booked, the car wash is performed.

8.2 Sample Code:

```
<?php
session_start();
error_reporting(0);
include('includes/config.php');
if(strlen($_SESSION['alogin'])==0)
   {
header('location:index.php');
}
else{
if($_POST['submit']=="Update")
{
   $pagetype=$_GET['type'];
   $pagedetails=$_POST['pgedetails'];
$sql = "UPDATE tblpages SET detail=:pagedetails WHERE type=:pagetype";
$query = $dbh->prepare($sql);
$query -> bindParam(':pagetype',$pagetype, PDO::PARAM_STR);
$query-> bindParam(':pagedetails',$pagedetails, PDO::PARAM_STR);
$query -> execute();
$msg="Page data updated  successfully";

}

   ?>
<!DOCTYPE HTML>
<html>
<head>
<title>CWMS | About Us Page</title>
<meta name="viewport" content="width=device-width, initial-scale=1">
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<meta name="keywords" content="Pooled Responsive web template, Bootstrap Web Templates, Flat Web Templates, Android Compatible web template,
Smartphone Compatible web template, free webdesigns for Nokia, Samsung, LG, SonyEricsson, Motorola web design" />
<script type="application/x-javascript"> addEventListener("load", function() { setTimeout(hideURLbar, 0); }, false); function hideURLbar(){ window.scrollTo(0,1); } </script>
<link href="css/bootstrap.min.css" rel='stylesheet' type='text/css' />
<link href="css/style.css" rel='stylesheet' type='text/css' />
<link rel="stylesheet" href="css/morris.css" type="text/css"/>
<link href="css/font-awesome.css" rel="stylesheet">
```

```
<script src="js/jquery-2.1.4.min.js"></script>
<link href='//fonts.googleapis.com/css?family=Roboto:700,500,300,100italic,100,400' rel='stylesheet' type='text/css'/>
<link href='//fonts.googleapis.com/css?family=Montserrat:400,700' rel='stylesheet' type='text/css'>
<link rel="stylesheet" href="css/icon-font.min.css" type='text/css' />
 <style>
      .errorWrap {
   padding: 10px;
   margin: 0 0 20px 0;
   background: #fff;
   border-left: 4px solid #dd3d36;
   -webkit-box-shadow: 0 1px 1px 0 rgba(0,0,0,.1);
   box-shadow: 0 1px 1px 0 rgba(0,0,0,.1);
}
.succWrap{
   padding: 10px;
   margin: 0 0 20px 0;
   background: #fff;
   border-left: 4px solid #5cb85c;
   -webkit-box-shadow: 0 1px 1px 0 rgba(0,0,0,.1);
   box-shadow: 0 1px 1px 0 rgba(0,0,0,.1);
}
      </style>

<script type="text/JavaScript">
<!--
function MM_findObj(n, d) { //v4.01
 var p,i,x;  if(!d) d=document; if((p=n.indexOf("?"))>0&&parent.frames.length) {
   d=parent.frames[n.substring(p+1)].document; n=n.substring(0,p);}
 if(!(x=d[n])&&d.all) x=d.all[n]; for (i=0;!x&&i<d.forms.length;i++) x=d.forms[i][n];
 for(i=0;!x&&d.layers&&i<d.layers.length;i++) x=MM_findObj(n,d.layers[i].document);
 if(!x && d.getElementById) x=d.getElementById(n); return x;
}

function MM_validateForm() { //v4.0
 var i,p,q,nm,test,num,min,max,errors='',args=MM_validateForm.arguments;
 for (i=0; i<(args.length-2); i+=3) { test=args[i+2]; val=MM_findObj(args[i]);
   if (val) { nm=val.name; if ((val=val.value)!="") {
     if (test.indexOf('isEmail')!=-1) { p=val.indexOf('@');
       if (p<1 || p==(val.length-1)) errors+='- '+nm+' must contain an e-mail address.\n';
```

```
    } else if (test!='R') { num = parseFloat(val);
      if (isNaN(val)) errors+='- '+nm+' must contain a number.\n';
      if (test.indexOf('inRange') != -1) { p=test.indexOf(':');
        min=test.substring(8,p); max=test.substring(p+1);
        if (num<min || max<num) errors+='- '+nm+' must contain a number between '+min+'
and '+max+'.\n';
   } } } else if (test.charAt(0) == 'R') errors += '- '+nm+' is required.\n'; }
  } if (errors) alert('The following error(s) occurred:\n'+errors);
  document.MM_returnValue = (errors == '');
}

function MM_jumpMenu(targ,selObj,restore){ //v3.0
  eval(targ+".location='"+selObj.options[selObj.selectedIndex].value+"'");
  if (restore) selObj.selectedIndex=0;
}
//-->
</script>
<script type="text/javascript" src="nicEdit.js"></script>
<script type="text/javascript">
   bkLib.onDomLoaded(function() { nicEditors.allTextAreas() });
</script>

</head>
<body>
  <div class="page-container">
  <!--/content-inner-->
<div class="left-content">
      <div class="mother-grid-inner">
            <!--header start here-->
<?php include('includes/header.php');?>

                <div class="clearfix"> </div>
             </div>
<!--heder end here-->
   <ol class="breadcrumb">
            <li class="breadcrumb-item"><a href="dashboard.php">Home</a><i class="fa
fa-angle-right"></i>Update Page Data </li>
         </ol>
       <!--grid-->
   <div class="grid-form">
```

```
<!---->
 <div class="grid-form1">
        <h3>Update Page Data</h3>
            <?php if($error){?><div class="errorWrap"><strong>ERROR</strong>:<?php
echo htmlentities($error); ?> </div><?php }
             else if($msg){?><div class="succWrap"><strong>SUCCESS</strong>:<?php
echo htmlentities($msg); ?> </div><?php }?>
          <div class="tab-content">
                <div class="tab-pane active" id="horizontal-form">
                        <form class="form-horizontal" name="package" method="post"
enctype="multipart/form-data">
                    <div class="form-group">
                         <label for="focusedinput" class="col-sm-2 control-label">Select
page</label>
                        <div class="col-sm-8">
                                                                <select name="menu1"
onChange="MM_jumpMenu('parent',this,0)">
                  <option value="" selected="selected" class="form-control">***Select
One***</option>
             <option value="about.php?type=aboutus">aboutus</option>

            </select>
                        </div>
                    </div>
<div class="form-group">
                        <label for="focusedinput" class="col-sm-2 control-label">Selected
Page</label>
                        <div class="col-sm-8">
                        <?php

        switch($_GET['type'])
        {
           case "aboutus" :
                        echo "About US";
                        break;
           default :
                    echo "";
                    break;

        }
```

```
        ?>
                        </div>
                      </div>
<div class="form-group">
                        <label for="focusedinput" class="col-sm-2 control-label">Package Details</label>
                        <div class="col-sm-8">

                                        <textarea class="form-control" rows="5" cols="50" name="pgedetails" id="pgedetails" placeholder="Package Details" required>
                          <?php
$pagetype=$_GET['type'];
$sql = "SELECT detail from tblpages where type=:pagetype";
$query = $dbh -> prepare($sql);
$query->bindParam(':pagetype',$pagetype,PDO::PARAM_STR);
$query->execute();
$results=$query->fetchAll(PDO::FETCH_OBJ);
$cnt=1;
if($query->rowCount() > 0)
{
foreach($results as $result)
{
echo htmlentities($result->detail);
}}
?>

</textarea>
</div>
</div>

<div class="row">
<div class="col-sm-8 col-sm-offset-2">
<button type="submit" name="submit" value="Update" id="submit" class="btn-primary btn">Update</button>


</div>
</div>

</div>
```

```
</form>

<div class="panel-footer">

</div>
</form>
</div>
</div>
<!--//grid-->

<!-- script-for sticky-nav -->
<script>
$(document).ready(function() {
var navoffeset=$(".header-main").offset().top;
$(window).scroll(function(){
var scrollpos=$(window).scrollTop();
if(scrollpos >=navoffeset){
$(".header-main").addClass("fixed");
}else{
$(".header-main").removeClass("fixed");
}
});

});
</script>
<!-- /script-for sticky-nav -->
<!--inner block start here-->
<div class="inner-block">

</div>
<!--inner block end here-->
<!--copy rights start here-->
<?php include('includes/footer.php');?>
<!--COPY rights end here-->
</div>
</div>
<!--//content-inner-->
<!--/sidebar-menu-->
<?php include('includes/sidebarmenu.php');?>
<div class="clearfix"></div>
</div>
```

```
<script>
var toggle = true;

$(".sidebar-icon").click(function() {
if (toggle)
{
$(".page-container").addClass("sidebar-collapsed").removeClass("sidebar-collapsed-back");
$("#menu span").css({"position":"absolute"});
}
else
{
$(".page-container").removeClass("sidebar-collapsed").addClass("sidebar-collapsed-back");
setTimeout(function() {
$("#menu span").css({"position":"relative"});
}, 400);
}

toggle = !toggle;
});
</script>
<!--js -->
<script src="js/jquery.nicescroll.js"></script>
<script src="js/scripts.js"></script>
<!-- Bootstrap Core JavaScript -->
<script src="js/bootstrap.min.js"></script>
<!-- /Bootstrap Core JavaScript -->

</body>
</html>
```

CHAPTER 9 : DATA DICTIONARY

9.1 Admin Table:

Table 9.1: Admin Table

NO	Field Name	Datatype	Constraint	Description
1.	Admin name	Varchar(20)	Primary Key	Name
2.	Password	Varchar(20)	Not Null	Password

Purpose: Stores login information for administrators.

Fields:

- **Admin Name (Varchar(20))**: Primary Key, identifies the admin uniquely.
- **Password (Varchar(20))**: Not Null, used for authentication.

9.2 User Table:

Table 9.2: User Table

Field Name	Data Type	Description	Example	Remarks
Customer ID	INT	Unique ID for each customer	268056740	Primary Key
Full Name	VARCHAR	Full name of the customer	Smith	Not Null
Phone Number	VARCHAR	Customer's contact number	1234567890	Unique, Not Null
Email	VARCHAR	Customer email address	smith123@gmail.com	Unique, Optional
Address	TEXT	Customer's address	Ahmedabad	Optional

Purpose: Contains data for customers who register or use the service.

Fields:

- **Customer ID (INT)**: Primary Key, uniquely identifies each customer.
- **Full Name (VARCHAR)**: Not Null, customer's full name.
- **Phone Number (VARCHAR)**: Unique, Not Null, used for contact.
- **Email (VARCHAR)**: Unique, Optional, stores email ID.
- **Address (TEXT)**: Optional, physical address of the customer.

9.3 Vehicle Table:

Table 9.3: Vehicle Table

Field Name	Data Type	Description	Example	Remarks
Vehicle ID	INT	Unique ID for each vehicle	54724855	Primary Key
Customer ID	INT	Linked customer ID	268056740	Foreign Key
License Plate	VARCHAR	Vehicle's license plate	GJ01MK6547	Unique, Not Null
Model	VARCHAR	Vehicle model	AMG	Not Null
Year	INT	Year of manufacture	2022	Optional

Purpose: Holds information about customer vehicles.

Fields:

- **Vehicle ID (INT)**: Primary Key, uniquely identifies each vehicle.
- **Customer ID (INT)**: Foreign Key, links to the User Table.
- **License Plate (VARCHAR)**: Unique, Not Null, vehicle registration number.
- **Model (VARCHAR)**: Not Null, vehicle model name.
- **Year (INT)**: Optional, year of manufacturing.

9.4 Service Table:

Table 9.4: Service Table

Field Name	Data Type	Description	Example	Remarks
Service ID	INT	Unique ID for each service type	1025478	Primary Key
Service Name	VARCHAR	Name of the car wash service	Car Wash	Not Null, Unique
Description	TEXT	Description of the service	Process	Optional
Price	DECIMAL	Description of the service	2000	Not Null

Purpose: Lists different car wash services offered.

Fields:

- **Service ID (INT)**: Primary Key, uniquely identifies each service type.
- **Service Name (VARCHAR)**: Not Null, Unique, name of the service.
- **Description (TEXT)**: Optional, details about the service.
- **Price (DECIMAL)**: Not Null, cost of the service.

9.5 Booking Table:

Table 9.5: Booking Table

Field Name	Data Type	Description	Example	Remarks
Booking ID	INT	Unique booking ID	26545655	Primary Key
Customer ID	INT	Customer making the booking	28021470	Foreign Key
Vehicle ID	INT	Vehicle to be washed	2015456	Foreign Key
Service ID	INT	Selected service	233	Foreign Key
Booking Date	DATE	Date the service is scheduled	23-10-2004	Not Null
Booking Time	TIME	Time of the scheduled service	11:00	Not Null

Status	VARCHAR	Status (e.g., Scheduled, Completed, Cancelled)	Pass/Fail	Default

Purpose: Records customer bookings for services.

Fields:

- **Booking ID (INT)**: Primary Key, unique booking reference.
- **Customer ID (INT)**: Foreign Key, references a customer.
- **Vehicle ID (INT)**: Foreign Key, references a vehicle.
- **Service ID (INT)**: Foreign Key, selected service type.
- **Booking Date (DATE)**: Not Null, date of the appointment.
- **Booking Time (TIME)**: Not Null, time slot for the service.
- **Status (VARCHAR)**: Default value (e.g., Scheduled, Completed).

9.6 Payment Table:

Table 9.6: Payment Table

Field Name	Data Type	Description	Example	Remarks
Payment ID	INT	Unique ID for each payment	456025565	Primary Key
Booking ID	INT	Related booking ID	201567200	Foreign Key
Amount	DECIMAL	Total payment amount	2000	Not Null
Payment Date	DATE	Date of payment	23-10-2003	Not Null
Payment Method	VARCHAR	e.g., Cash, Credit Card, Online	Cash	Not Null

Purpose: Tracks payment transactions for bookings.

Fields:

- **Payment ID (INT)**: Primary Key, uniquely identifies each payment.
- **Booking ID (INT)**: Foreign Key, relates to a specific booking.
- **Amount (DECIMAL)**: Not Null, total amount paid.
- **Payment Date (DATE)**: Not Null, when payment was made.

The Car Washing Service System maintains structured data across multiple core entities to streamline operations, customer service, and business management. The primary entity is the Customers table, which stores personal details such as CustomerID (a unique identifier), full name, contact information (email and phone number), address (for home service options), and registration date. Connected to this is the Vehicles table, which links each customer to one or more vehicles by storing attributes like LicensePlate, Make, Model, Year, and Color.

The Bookings table records all appointments for car wash services. Each booking is uniquely identified by BookingID and is associated with a customer and a specific service type via foreign keys. It also includes fields like BookingDateTime, VehicleType, booking Status (such as Pending or Completed), and special customer instructions. The types of services offered—such as Basic Wash, Interior Detailing, or Premium Wash—are cataloged in the Services table, which includes the ServiceID, ServiceName, a textual Description, the Price, estimated Duration, and a Boolean IsActive status.

CHAPTER 10 : TESTING

Table 10.1: Testing Table

Test Case ID	Test Scenario	Test Steps	Expected Result	Pass/Fail
TC001	Booking a car wash online	Open website/app → Select car type → Choose service → Pick time slot → Confirm	Booking confirmation is shown with all details	Pass/Fail
TC002	Walk-in customer handling	Customer arrives → Staff registers manually → Assigns service & queue	Customer is logged and added to queue	Pass/Fail
TC003	Payment processing (online)	User selects service → Pays via credit card/wallet	Payment is successful, receipt is generated	Pass/Fail
TC004	Payment processing (cash)	Customer chooses cash → Staff marks as paid manually	Payment recorded manually, receipt provided	Pass/Fail
TC005	Exterior wash time accuracy	Start timer → Perform standard exterior wash → Stop timer	Completed within expected time (e.g., 15 minutes)	Pass/Fail
TC006	Interior cleaning quality check	After service, inspect interior for dirt, stains, and missed spots	Interior is visibly clean, no missed areas	Pass/Fail
TC007	Vehicle damage check (pre/post)	Record pre-wash condition → Compare post-wash	No new damages found	Pass/Fail
TC008	Staff hygiene and uniform compliance	Inspect staff during work hours	All staff in uniform, wearing gloves where necessary	Pass/Fail

TC009	Equipment functionality test	Test pressure washer, vacuum, etc.	All equipment working as intended	Pass/Fail
TC010	Customer feedback collection	After service, prompt customer for	Feedback recorded successfully	Pass/Fail

Testing for the car wash service project is a critical phase that ensures the system functions as intended and delivers a smooth user experience across all modules. It involves verifying key features such as user registration and login, service selection, booking management, payment processing, and service execution. Functional testing is performed to confirm that each feature behaves according to the requirements, including edge cases like booking unavailability or failed payments.

Additionally, integration testing is conducted to ensure seamless interaction between different components—such as the frontend interface, backend APIs, databases, and payment gateways. Database testing checks for proper data storage, retrieval, and integrity related to users, bookings, and service records. Usability testing ensures that the platform is user-friendly, intuitive, and accessible, while performance testing verifies the system's response time under various loads, especially during peak booking periods. Security testing is also crucial to safeguard user information and payment data. Overall, a well-planned and executed testing phase ensures the reliability, security, and effectiveness of the car wash service system before deployment.

There are Different types of testing:

1. Unit Testing:

Unit testing focuses on testing individual components or functions of a software application in isolation. It is usually performed by developers during the coding phase using frameworks like JUnit or NUnit. The main goal is to ensure that each unit of code works as expected. Unit tests are fast, automated, and help detect bugs early in development. They

do not depend on external systems like databases or APIs. This type of testing forms the foundation for a stable application.

2. Integration Testing:

Integration testing evaluates how different modules or services in an application work together. After unit testing, components are combined and tested to ensure they interact correctly. This helps identify issues like data mismatch, interface errors, or unexpected behavior between integrated parts. It can be done using approaches like top-down, bottom-up, or sandwich testing. Integration testing ensures the system works well as a unified whole. It is essential for complex applications with multiple interconnected modules.

3. System Testing:

System testing tests the complete and fully integrated software to verify that it meets the specified requirements. It is performed by QA teams in a staging or test environment. This type of testing is black-box based, meaning testers don't need to know the internal code structure. It includes functional and non-functional testing aspects like usability, performance, and security. System testing ensures the software behaves as intended in real-world scenarios. It acts as a final validation before acceptance testing.

4. Functional Testing:

Functional testing checks the software's features and functionalities to ensure they work as intended. It is based on the requirements and specifications provided by the client or stakeholder. Testers verify inputs, actions, and outputs of the system using black-box testing methods. It often involves testing user commands, data manipulation, and integrations. The goal is to validate that each function delivers the correct output. Functional testing plays a vital role in confirming business logic.

5. Usability Testing:

Usability testing evaluates how user-friendly, intuitive, and efficient the software is for end users. It involves real users performing tasks to identify usability issues like poor navigation or confusing interfaces. The goal is to enhance the user experience and satisfaction. Testers observe behavior and collect feedback to make improvements. It can

uncover accessibility problems or inconsistencies in design. Usability testing is especially critical for consumer-facing applications and websites.

6. Performance Testing:

Performance testing measures the speed, responsiveness, and stability of a system under various conditions. It includes load testing, stress testing, and scalability testing. The objective is to ensure the application performs well during expected and peak usage. It helps identify bottlenecks, crashes, or slowdowns that affect user experience. Tools like JMeter or LoadRunner are commonly used. Performance testing is vital for high-traffic systems like e-commerce or banking apps.

7. Security Testing:

Security testing checks the system for vulnerabilities, threats, and risks to ensure data protection and system integrity. It involves testing for issues like SQL injection, cross-site scripting (XSS), and unauthorized access. The purpose is to prevent data breaches and ensure compliance with security standards. Penetration testing and ethical hacking are common techniques used. It is essential for applications dealing with sensitive data like banking or healthcare. A secure system builds trust with users and clients.

8. Acceptance Testing:

Acceptance testing is the final level of testing before the software is released to production. It determines whether the system meets business requirements and is acceptable to the client. This testing is often done by the client or end users in a real-world environment. User Acceptance Testing (UAT) ensures that the product works for its intended purpose. It includes testing real scenarios and verifying outcomes. A successful acceptance test means the software is ready for deployment.

CHAPTER 11 : USER MANUAL

11.1 User Side:

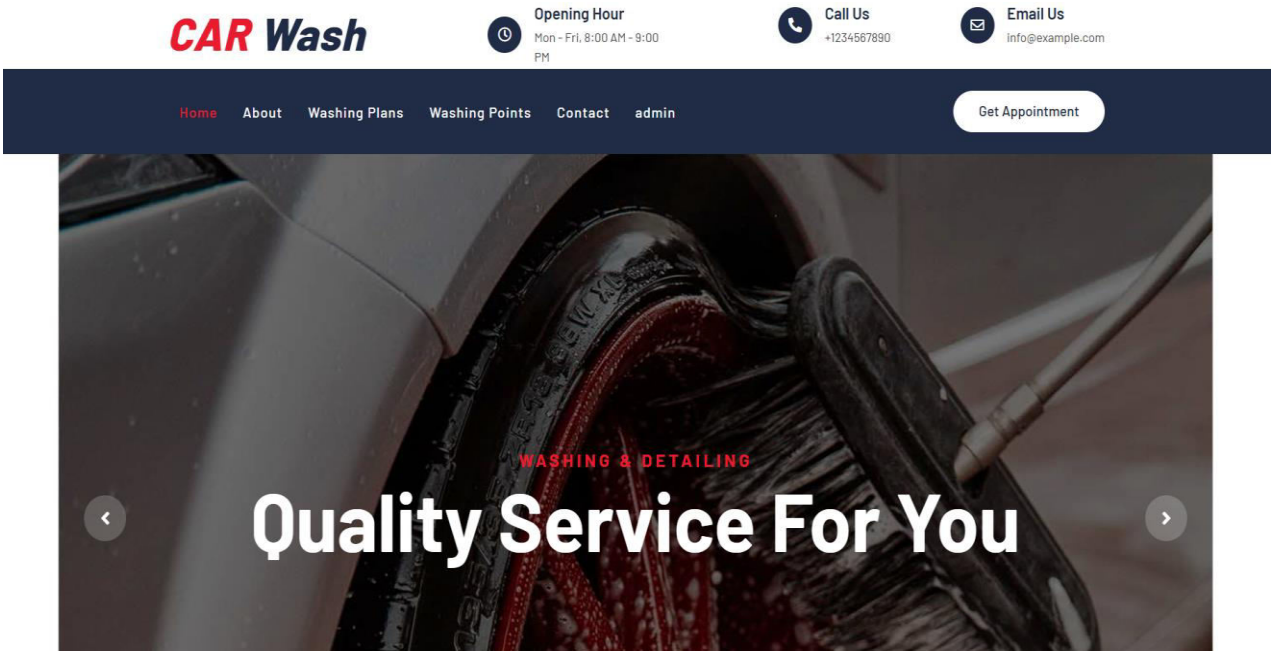


Figure 11.1: Web Page

This is main Website page for user side, There are many features in this page such as Washing Plans, Washing Points Contact etc. User Can Access all pages, and User can Know all the information about car washing company like When it's open, and user can get appointment in this page.

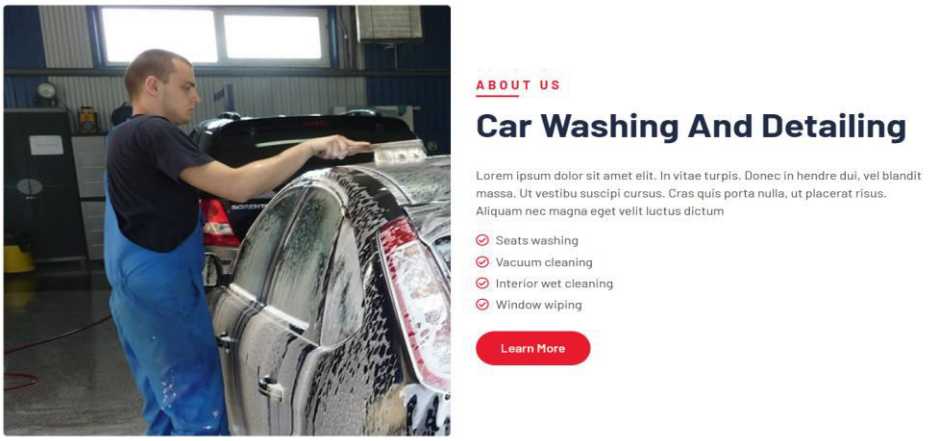


Figure 11.2: About Us

User can know every information of company in this content in detail. As you can see There are so many services Like Seat Washing, Vacuum Cleaning, Interior Cleaning, Window Wiping etc. If user wants to learn more then user can know all the information click o button Learn More.

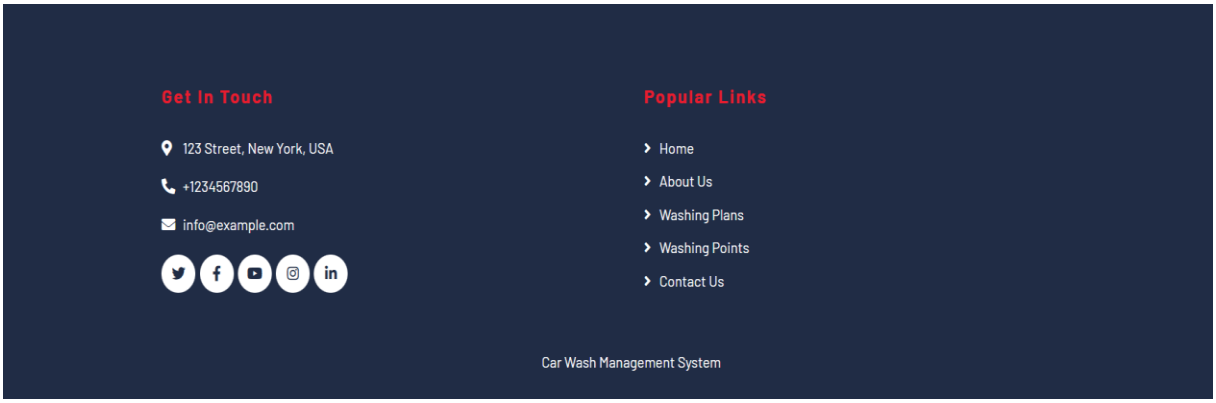


Figure 11.3: Get In Touch

User can access all social media platform like Twitter, Facebook, Youtube, Instagram and LinkedIn for more information about company.

Figure 11.4: Washing Points

There are Four car washing center in this company. XYZ car washing point is located in iskcon, ABC car washing point is located in Gandhinagar, Matrix car washing point is located in Jaipur and Clean car washing point is located in Rajkot. User can service own vehicle in any of center, depends on user.

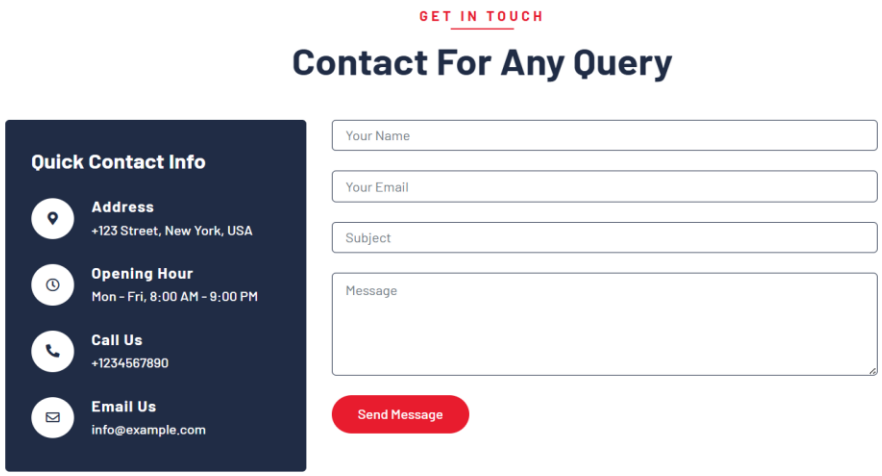


Figure 11.5: Send Query

If user get any queries then company give a separate form for submitting queries. User's name and user's email and subject of query and any type of extra message as depends on user then submit it. A particular query is sent in admin panel and user can get all the answers of their queries

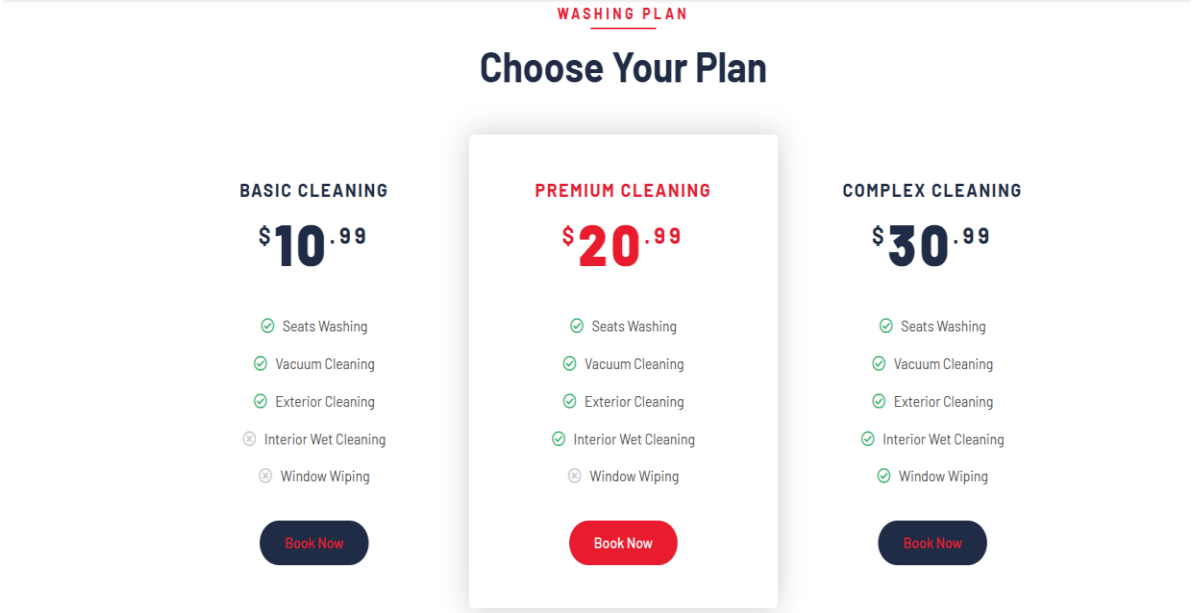


Figure 11.6: Choose Plan

There are three types of services in this company. All services have a different plans like Basic Cleaning's cost is 10.99$, Premium Cleaning's cost is 20.99$ and Complex Cleaning's cost is 30.99$. There are different Packages in each Service plans, but the costliest service is provided all services as you can see,User can access any plan of these, as user want and click a book now for booking.

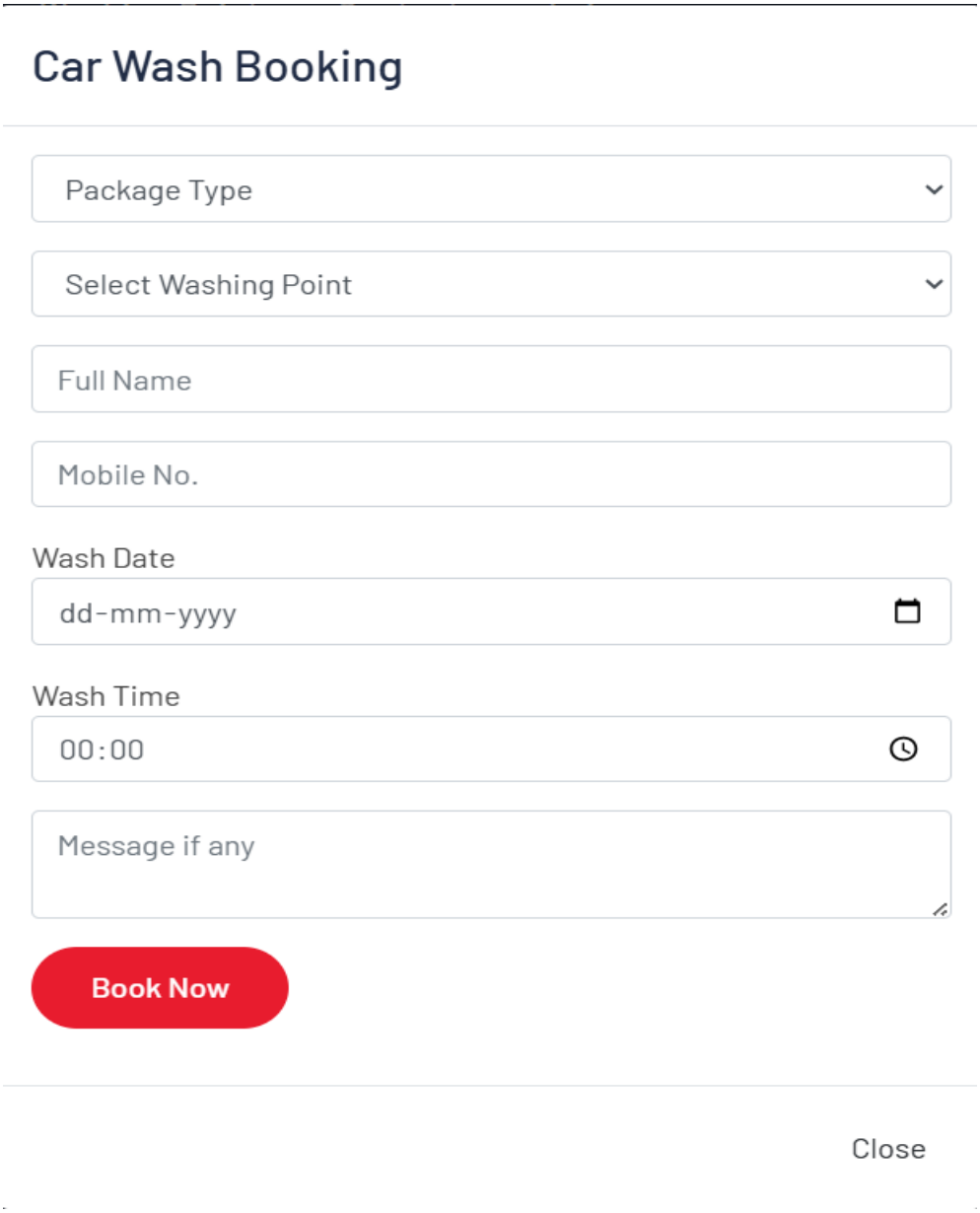


Figure 11.7: Car Washing Booking

This is booking form for any types of service booking. First of all User can select any packages as user's want after that user can select washing point and user must be submitted

to his/her full name or mobail number. After that book a washing date for car service, and time. Date and Time is flexible, user can that select date and time when his/her free. Last one user give any extra massage for service to company then he/she type in massage box, all information submitted by user than his/her booking is done.

11.2 Admin Side:

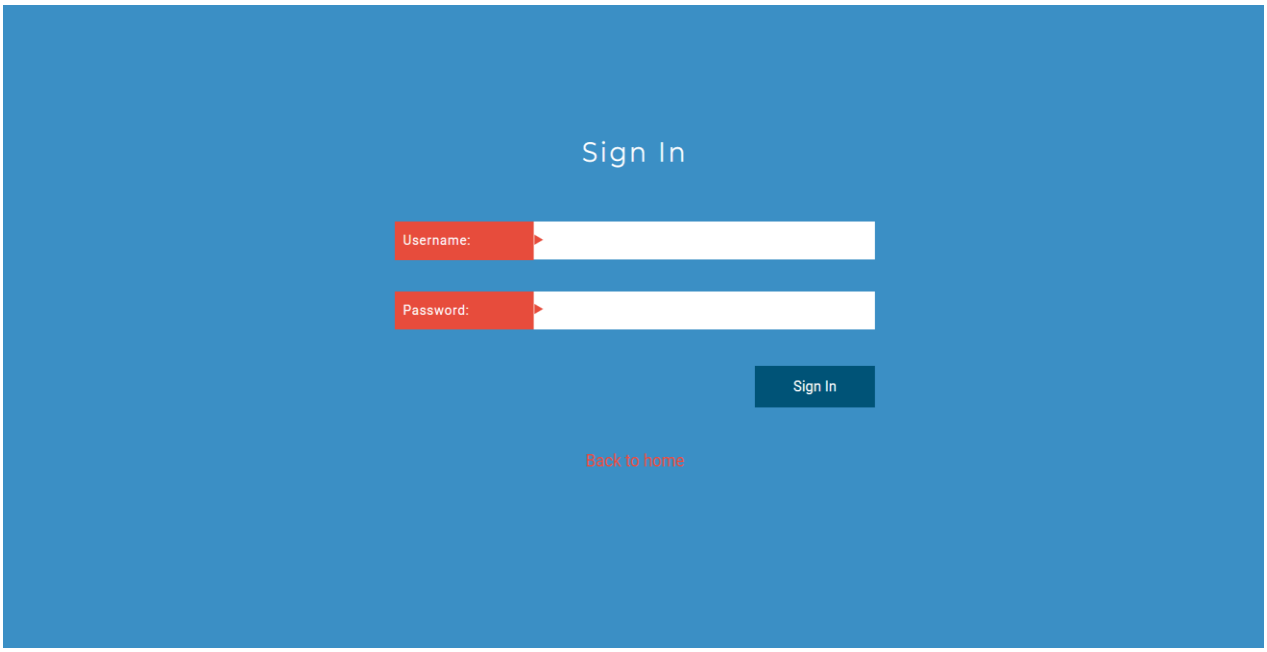


Figure 11.8: Admin Login Page

This is sign in page for admin. If Admin can right user id and password then he/she entered a admin panel. In case user id and password are wrong then he/she going back to home.

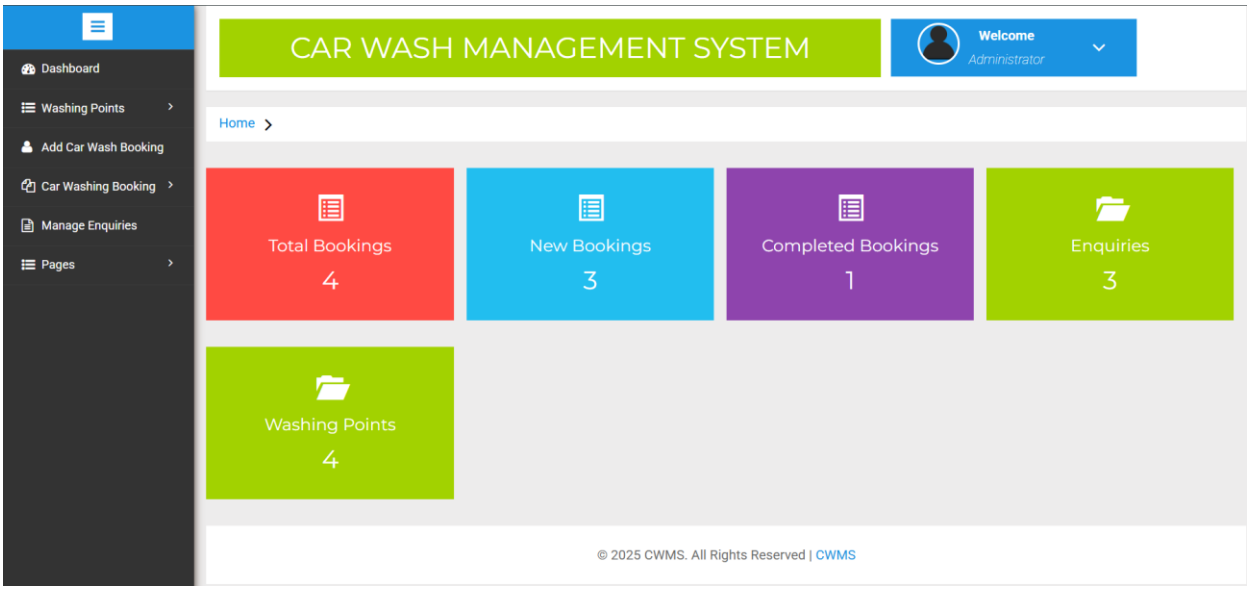


Figure 11.9:Admin Dashboard

This is admin side Dashboard. There are many types of features in admin panel, As you can see there are five section in admin panel like Total Bookings, New Bookings, Completes Bookings, Enquiries and Washing Points. Left side of the Screen Shot we can see admin can manage all the formalities for enquiryAdd washing points, car washing booking and different pages.

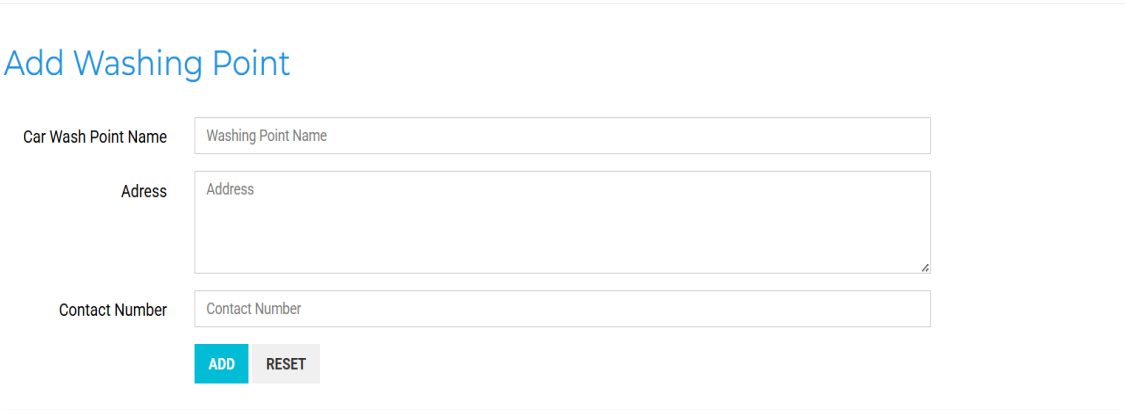


Figure 11.10: Add Washing Point

Admin can add washing point in this form. Add on name of car wash point and address and contact number for new washing point.

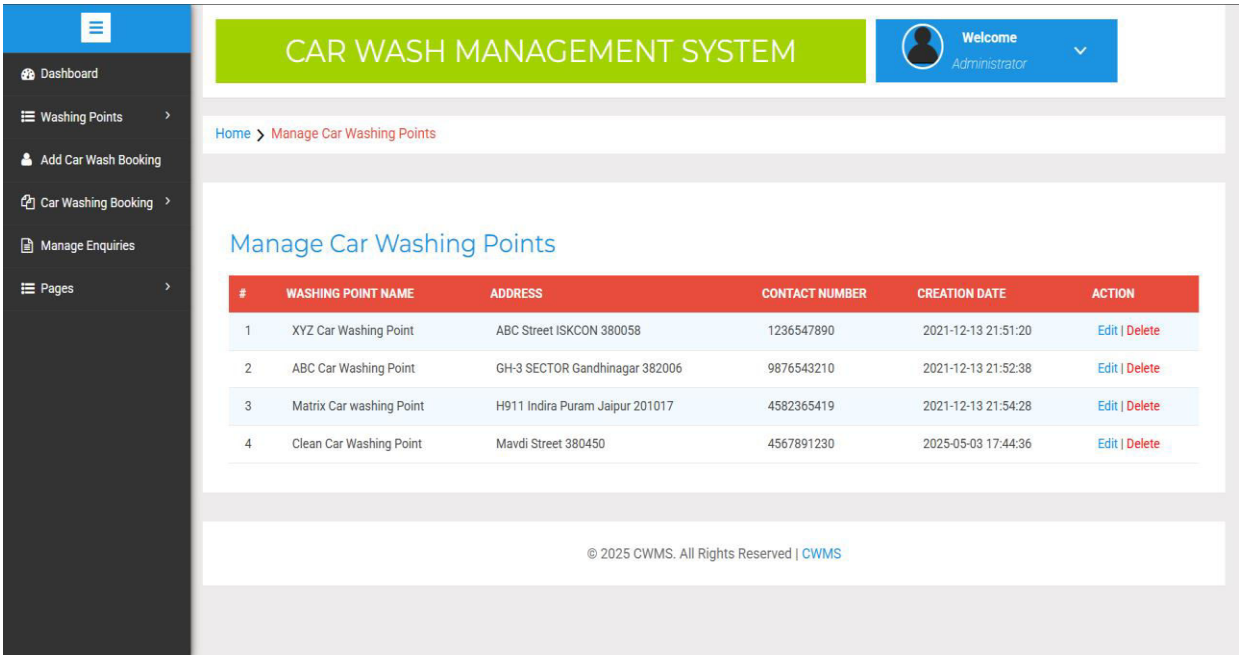


Figure 11.11: Manage Washing Points

There are four washing point in admin panel. There are different location and different address and different contact number for each washing center. Admin can change and also delete any kind of information in washing point name, address and contact number.

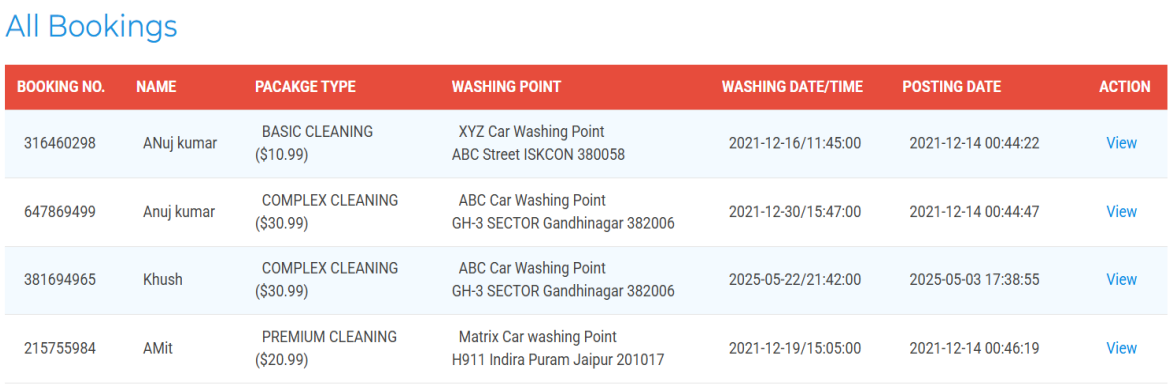


Figure 11.12: All Bookings

There are all booking details shows in booking section. Admin can view any booking and take action for next formalities. Booking No, Name, Package Type, Washing Point, Date and time all the information shows in booking section.

Figure 11.13: New Bookings

There are all new bookings shows in car washing booking. Admin can view and change any booking for next formalities. People name and their package type and washing point and date and time shows in booking section.

Figure 11.14: Update Booking

For Payment procedure first select a transaction type like Cash, E-wallet, UPI, Debit/Credit cards etc.After that transaction number is must required to particular transaction and last one is done or fail to Admin remarks for user and update information.

Bookings Details #316460298

BOOKING ID#	316460298	POSTING DATE	2021-12-14 00:44:22
NAME	ANuj kumar	MOBILE NO	1234567890
PACKAGE TYPE	BASIC CLEANING ($10.99)	WASHING POINT	XYZ Car Washing Point ABC Street ISKCON 380058
WASHING DATE	2021-12-16	WASHING TIME	11:45:00
MESSAGE (IF ANY)	NA		
STATUS	Completed		
Admin Details			
TRANSACTION TYPE	e-Wallet	TRANSACTION NO.(IF ANY)	345345345
ADMIN REMARK	Washing completed		

Figure 11.15: Booking Details

All Completed bookings can see in booking section. There are all types of information like status, transaction type, admin remark and transaction number include in completed booking section.

Manage Enquiries

TICKET ID	NAME	EMAIL	SUBJECT	DESCRIPTION	POSTING DATE	ACTION
#TCKT-4	Anuj kumar	anuj@gmail.com	General Enquiry	I want to know the price of car wash	2021-12-13 23:57:53	Read
#TCKT-5	Amit	amit@gmail.com	Test	Test	2021-12-15 00:44:22	Read
#TCKT-6	harry	harry123@gmail.com	services	how many services?	2025-05-03 17:49:55	Pending

Figure 11.16: Manage Enquiries

When user sent queries to admin after that all queries shows here. There are many components in queries like Ticket id, Name, Email, Subject, Description and Posting time and Date. Admin Can Change status of queries and that results shows Read and Pending.

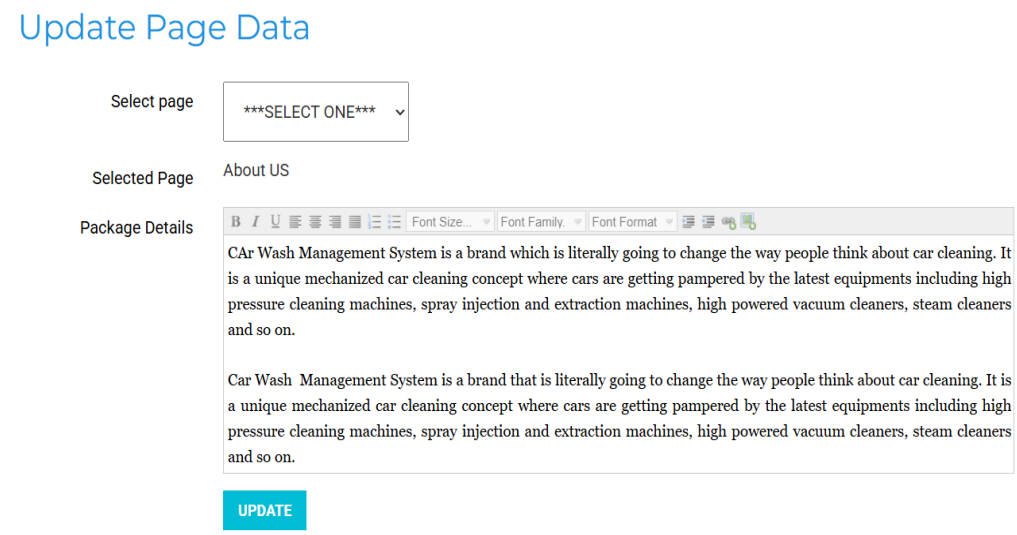


Figure 11.17: Update Page

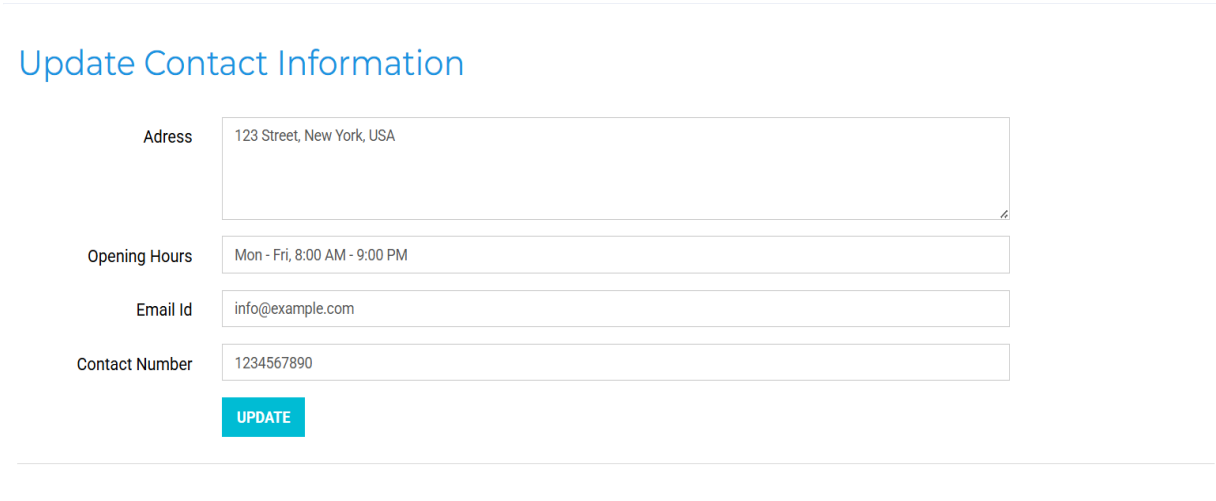


Figure 11.18: Upadte Contact

Admin Can change all the information like About us, Address, Opening hours, Email id, Contact Number Package Details etc. in admin panel.

CHAPTER 12 : CONCLUSION AND FUTURE WORK

12.1 Conclusion:

The car washing service project has been an insightful and practical initiative that underscores the growing demand for convenient, eco-friendly, and quality vehicle maintenance solutions. Through thorough market research, service planning, and operational execution, this project has successfully demonstrated how a well-structured car wash business can fulfill a critical need while maintaining sustainability and profitability.

Throughout the project, various aspects such as target customer identification, competitive analysis, location selection, pricing strategy, marketing plans, and resource management were carefully addressed. By focusing on customer satisfaction, time efficiency, and environmental responsibility, the service was designed to stand out in a competitive market. Water-saving techniques, biodegradable cleaning products, and optional mobile services added further value and aligned with modern consumer preferences for green businesses.

In conclusion, the car washing service project has not only highlighted the viability of launching a service-based startup in the automotive care industry but also provided valuable learning experiences in entrepreneurship, service quality, and sustainability practices. With continued innovation, strong customer service, and operational efficiency, this model can be scaled successfully and contribute meaningfully to both economic and environmental goals.

12.2 Future Work:

As the car washing service progresses beyond its initial phase, there are several opportunities for growth, improvement, and innovation. The following areas highlight potential directions for future development:

1.Service Expansion:

- Mobile Car Wash Units: Invest in fully equipped vans or trailers to offer doorstep services, enhancing customer convenience.
- Subscription Plans: Introduce weekly, bi-weekly, or monthly plans to secure recurring revenue and improve customer retention.
- Fleet Services: Partner with companies that own vehicle fleets (e.g., taxi firms, delivery services) for bulk contracts.

2.Technology Integration:

- Online Booking System: Develop a mobile app or website with real-time booking, payments, and customer feedback.
- CRM Tools: Implement customer relationship management software to track service history and personalize offerings.
- IoT & Automation: Explore the use of smart sensors for water management and automated systems for washing efficiency.

3. Sustainability Initiatives:

- Water Recycling Systems: Install equipment that captures and recycles used water to reduce waste.
- Eco-friendly Products: Continue adopting biodegradable and non-toxic cleaning agents.
- Solar Energy: Use solar panels to power machinery and reduce dependence on the grid.

4. Staff Training and Quality Control:

- Skill Development Programs: Regular training on customer service, eco-washing techniques, and equipment handling.
- Standardized Operating Procedures (SOPs): Ensure consistent service quality across all teams and locations.

5. Marketing and Branding:

- Social Media Campaigns: Boost digital presence through targeted ads, customer reviews, and promotional offers.
- Loyalty Programs: Reward frequent customers with discounts, free services, or gift vouchers.
- Franchise Model: Explore franchising once a successful prototype is established.

6. Diversification of Services:

- Interior Detailing: Offer vacuuming, upholstery cleaning, and odor removal.
- Paint Protection and Polishing: Add high-margin services like ceramic coating or waxing.
- Pet Hair Removal & Allergy Treatments: Cater to niche markets and health-conscious customers.

7. Community and Corporate Social Responsibility:

- Local Partnerships: Collaborate with NGOs or local governments for awareness drives on water conservation.
- Job Creation: Continue to create employment opportunities, especially for underprivileged or unskilled workers.

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11. **R. Kim and S. Park**, "Automation in Car Wash Systems Using Machine Learning," IEEE Transactions on Automation Science and Engineering, vol. 17, no. 3, pp. 1234-1242, July 2020.

12. **T. Oliveira et al.**, "Designing Eco-Friendly Car Wash Services," Sustainable Cities and Society, vol. 52, pp. 101-109, 2020.

ANNEXURE

Tools and Technology:

- **Visual Studio Code (VS Code):**

Visual Studio Code is a free, lightweight source-code editor developed by Microsoft for Windows, Linux, and macOS. It supports debugging, syntax highlighting, code completion, version control integration, and a wide range of extensions that enhance development workflows for HTML, CSS, JavaScript, PHP, and other languages.

- **XAMPP:**

XAMPP is a free and open-source cross-platform web server solution stack package developed by Apache Friends. It provides a local server environment including Apache, MySQL, PHP, and Perl, making it ideal for testing and development of dynamic websites on a local machine.

- **MySQL:**

MySQL is an open-source relational database management system. It is used to store and manage structured data and supports features such as indexing, joins, transactions, and foreign keys. MySQL is widely used in conjunction with PHP to build dynamic web applications.

- **Php:**

PHP stands for Hypertext Preprocessor. It is an open-source, widely used language for web development. Developers can create dynamic and interactive websites by embedding PHP code into HTML. PHP can handle data processing, session management, form handling, and database integration.

About the Organization:

Spigot Infotech: Empowering Digital Innovation :

Spigot Infotech is a forward-thinking IT solutions provider based in Ahmedabad, Gujarat, dedicated to transforming businesses through innovative technology services. Since its inception in 2019, Spigot has been committed to delivering customized digital solutions that drive efficiency, scalability, and growth for clients across various industries.

Our team of skilled professionals specializes in a wide array of services, including web development, mobile application development, UI/UX design, and digital transformation strategies. By leveraging the latest technologies and a client-centric approach, we ensure that our solutions are not only robust and secure but also aligned with our clients' unique business objectives.

Core Service Offerings:

1. **Web Development:** Crafting responsive and user-friendly websites that enhance brand presence and user engagement.

2. **Mobile Application Development:** Developing cross-platform mobile apps that provide seamless user experiences on both iOS and Android devices.

3. **UI/UX Design:** Designing intuitive interfaces that offer engaging and accessible user experiences.

4. **Digital Transformation:** Implementing technology-driven strategies to modernize business processes and improve operational efficiency.

5. **Custom Software Solutions:** Building tailored software applications that address specific business challenges and requirements.

6. **IT Consulting:** Providing expert guidance to help businesses navigate the complexities of the digital landscape and make informed technology decisions.

At Spigot Infotech, we believe in fostering long-term partnerships with our clients by delivering solutions that not only meet their current needs but also anticipate future challenges. Our commitment to excellence, transparency, and continuous improvement positions us as a trusted technology partner in the ever-evolving digital world.

Company Details:

- **Founded:** 2019
- **Headquarter:** Ahmedabad, Gujarat, India
- **Company Size:** 11-30 employees
- **Website:** https://www.spigotinfotech.in
- **Contact Email:** info@spigotinfotech.in
- **Phone:** +91 9638079567

Spigot Infotech is more than just a service provider; we are a dedicated partner in your digital journey, committed to delivering solutions that drive success and innovation.

ABOUT COLLEGE

Ganpat University - U.V. Patel College of Engineering (GUNI-UVPCE) is situated in Ganpat Vidyanagar campus. It was established in September 1997 with the aim of providing educational opportunities to students from It is one of the constituent colleges of Ganpat University various strata of society. It was armed with the vision of educating and training young talented students of Gujarat in the field of Engineering and Technology so that they could meet the demands of Industries in Gujarat and across the globe.

The College is named after Shri Ugarchandbhai Varanasibhai Patel, a leading industrialist of Gujarat, for his generous support. It is a self-financed institute approved by All India Council for Technical Education (AICTE), New Delhi and the Commissionerate of Technical Education, Government of Gujarat.

The College is spread over 25 acres of land and is a part of Ganpat Vidyanagar Campus. It has six ultramodern buildings of architectural splendor, classrooms, tutorial rooms, seminar halls, offices, drawing hall, workshop, library, well equipped departmental laboratories, and several computer laboratories with internet connectivity through 1 Gbps Fiber link, satellite link education center with two-way audio and one-way video link. The superior infrastructure of the Institute is conducive for learning, research, and training. The Institute offers various undergraduate programs, postgraduate programs, and Ph.D. programs. Our dedicated efforts are directed towards leading our student community to the acme of technical excellence so that they can meet the requirements of the industry, the nation and the world at large. We aim to create a generation of students that possess technical expertise and are adept at utilizing the technical 'know-hows' in the service of mankind.