American International University-Bangladesh (AIUB)

Department of Computer Science

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Laundry Management System

Software Requirement Engineering

Sec: **B**

Project submitted

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Table Of Context

1. PROBLEM DOMAIN

1.1 Background to the Problem

- The background to the problem for online laundry services is related to the increasing demand for a convenient and time-saving solution for people who lead busy lives and do not have the time or energy to do their own laundry. Laundry is an essential part of our daily lives, and many people do not have the time or resources to do it themselves. The traditional laundry services can be inconvenient as customers need to travel to a physical location to drop off and pick up their laundry, which can be time-consuming and inconvenient. They need a reliable and efficient solution to handle their laundry needs, and with the increasing use of technology, they are looking for an online laundry service that can offer them convenience and quality service.

- However, the current laundry service industry is fragmented, and customers have limited options to choose from. They may not know which service providers are trustworthy and which ones can provide quality service. Also, there is a lack of transparency in pricing and service quality, making it challenging for customers to make informed decisions. Therefore, there is a need for an online laundry service platform that can offer customers a wide range of options, transparent pricing, and a seamless user experience.

1.2 Solution to the Problem

- To solve the challenges faced by customers in the laundry service industry, an online laundry service platform can be developed that allows customers to search for their preferred laundry service providers. The platform can offer both web and app-based solutions, making it accessible to a wide range of customers. Customers can search for their preferred laundry brands or local laundry service providers, filter their searches based on location and service type, and select the one that best meets their needs. The platform can also offer customers a map view of the available laundry service providers and their locations, making it easier for them to choose one near their location.

  One of the key features of the online laundry service is the ability for customers to schedule their laundry pickups and deliveries online, eliminating the need to travel to a physical location. Customers can simply specify the date and time they want their laundry picked up, and the service provider will come to their location to collect the laundry. Similarly, customers can specify the date and time they want their laundry delivered, and the service provider will deliver the cleaned laundry to their doorstep.

- To enhance the customer experience, the online laundry service will also provide real-time tracking of laundry pickups and deliveries. Customers will be able to track the status

of their laundry from pickup to delivery, ensuring that they are always aware of the progress of their laundry. This will give customers peace of mind and ensure that they can plan their schedules accordingly.

- To ensure quality service, the platform can offer a rating and review system for laundry service providers. This system will enable customers to rate their experience and provide feedback on the service quality, pricing, and overall customer experience. It will also help build trust and transparency in the industry by providing customers with a better understanding of the quality of service offered by different providers.

- The platform can also offer transparent pricing and payment options, allowing customers to see the cost of different laundry services upfront and choose the one that fits their budget. The platform can accept secure online payments, making it convenient for customers to pay for the service without worrying about cash handling.
- The development of an online laundry service platform can offer customers a convenient and reliable solution to their laundry needs. It can provide customers with a wide range of options, transparent pricing, and a seamless user experience. This will help improve the quality of service and increase customer satisfaction, thereby promoting the growth of the laundry service industry.

- The existing software solutions that are available to solve the problem are laundry management system, Elaundry(https://www.elaundry.com.bd), Dhopaghat(https://www.dhopaghat.com), Hello Laundry (http://hellolaundry.com.bd) etc. The current system lacks a real-time map, sophisticated security, and an online database. On the other side, this project includes these qualities.

2. SOLUTION DESCRIPTION

2.1 System Features

Common Feature:

System Feature: Home Page:

Functional Requirements:

1. The home page should provide users with an overview of the laundry service.
2. The home page should allow users to navigate to different sections of the website.

3. The home page should include a search function that allows users to find laundry service providers by location.
4. The home page should display the most popular laundry service providers or promotions.
5. The home page should allow users to register or sign in to their account.
6. The home page should display information about the laundry service, such as pricing, delivery options, and payment methods.

Quality Attributes:

1. Usability: The home page should be easy to navigate and provide users with the information they need quickly and efficiently.
2. Reliability: The home page should be stable and available to users at all times.
3. Performance: The home page should load quickly and respond to user actions promptly.
4. Security: The home page should protect user data and ensure the privacy and security of sensitive information.
5. Accessibility: The home page should be accessible to users with disabilities, including those who use assistive technology.
6. Scalability: The home page should be able to handle a large number of users and display information in real-time.

System Feature: Login

Functional Requirements:

1. Allow users (admin, office-employee, deliver, customer) to log in to their account using their email address or user name and password or social media credentials.
2. Allow users to reset their password in case they forget it.
3. Allow users to create an account by providing their basic details and contact information.

Quality Attributes:

1. Usability: The login system must be user-friendly and easy to navigate for users of all technical backgrounds.
2. Security: The login system must ensure the confidentiality and integrity of user credentials and prevent unauthorized access to user accounts.
3. Performance: The login system must be fast and responsive to provide a seamless user experience.
4. Accessibility: The login system must be accessible to users with disabilities or special needs.

Admin:

System Feature: ADD (office employee, delivery personnel, Laundry Company, add branch of different Laundry Company)

Functional Requirements:

1. The system should allow authorized users (Admin) to add new office employees, delivery personnel, and laundry companies to the system.
2. The system should provide a user-friendly interface for entering and saving information about newly added employees and companies.
3. The system should allow the addition of different branches for each laundry company, along with their location details.

Quality Attributes:

1. Usability: The system should have an intuitive and easy-to-use interface for adding new entities to the system, reducing the chances of user errors.
2. Reliability: The system should ensure that all newly added entities are correctly saved and available for future use.
3. Security: The system should have appropriate access controls to ensure that only authorized users can add new entities to the system.
4. Scalability: The system should be able to handle a large number of concurrent requests for adding new entities to the system without compromising its performance.

System Feature: Delete (Office employee, delivery personnel, Laundry Company)

Functional Requirements:

1. The system should allow authorized users (Admin) to delete office employees, delivery personnel, and laundry companies from the system.
2. The system should prompt the user to confirm the deletion action before removing any entity from the system.
3. The system should ensure that deleting an entity will not cause data inconsistencies in the system.

Quality Attributes:

1. Usability: The system should have a clear and easy-to-use interface for deleting entities from the system, reducing the chances of user errors.
2. Reliability: The system should ensure that all deleted entities are correctly removed from the system and will not cause any data inconsistencies.
3. Security: The system should have appropriate access controls to ensure that only authorized users can delete entities from the system.
4. Scalability: The system should be able to handle a large number of concurrent requests for deleting entities from the system without compromising its performance.

System Feature: View (All information customer, office employee, delivery personnel, all company)

Functional Requirements:

1. The system should allow authorized users (Admin) to view all information about customers, office employees, delivery personnel, and laundry companies stored in the system.
2. The system should provide a user-friendly interface for displaying the requested information to the user.
3. The system should allow the user to filter and sort the displayed information based on various criteria.

Quality Attributes:

1. Usability: The system should have an intuitive and easy-to-use interface for displaying information to the user, reducing the chances of user errors.
2. Reliability: The system should ensure that all information displayed to the user is accurate and up-to-date.
3. Security: The system should have appropriate access controls to ensure that only authorized users can view the requested information.
4. Scalability: The system should be able to handle a large number of concurrent requests for displaying information to the user without compromising its performance.

System Feature: Update (All information)

Functional Requirements:

1. The system should allow authorized users to update all information about customers, office employees, delivery personnel, and laundry companies stored in the system.

2. The system should provide a user-friendly interface for modifying the existing information and saving the changes to the system.
3. The system should ensure that updating an entity will not cause data inconsistencies in the system.

Quality Attributes:

1. Usability: The system should have an intuitive and easy-to-use interface for updating information, reducing the chances of user errors.
2. Reliability: The system should ensure that all updated information is correctly saved and available for future use.
3. Security: The system should have appropriate access controls to ensure that only authorized users can update information in the system.
4. Scalability: The system should be able to handle a large number of concurrent requests for updating information without compromising its performance.

System Feature: Activities Track

Functional Requirements:

1. The system should be able to track all office-employee's activities.
2. The system should be able to track the location of delivery employees in real-time.
3. The system should be able to track the status of customer orders, from pickup to delivery.
4. The system should be able to generate reports on employee productivity and order fulfillment.

Quality Attributes:

1. Usability: The tracking function should be easy to use for employees and managers, with clear instructions and an intuitive interface.
2. Reliability: The tracking function should provide accurate and up-to-date information on employee location and order status.
3. Performance: The tracking function should be fast and efficient, with minimal loading times for tracking information and notifications.
4. Security: The tracking function should ensure the privacy and security of customer and employee data.
5. Scalability: The tracking function should be able to handle a large number of tracking requests and provide information in real-time.

Office Employee:

System Feature: View Order from Customer and Laundry Service

Functional Requirements:

1. The system should allow the office employee to view all orders placed by customers.
2. The system should display details of each order, such as the customer's name, contact information, delivery address, and order status.
3. The system should allow the office employee to filter and sort orders based on various criteria, such as delivery date, order status, and customer name.
4. The system should allow the office employee to view orders placed by different laundry service providers.
5. The system should display details of each order, such as the laundry service provider name, contact information, and order status.
6. The system should allow the office employee to filter and sort orders based on various criteria, such as delivery date, order status, and laundry service provider name.

Quality Attributes:

1. Usability: The system should provide an easy-to-use interface for viewing and managing orders.
2. Reliability: The system should display accurate and up-to-date information about each order and its status.
3. Performance: The system should be fast and efficient, with minimal loading times for order details and search results.
4. Security: The system should ensure the privacy and security of customer and laundry service provider data.
5. Scalability: The system should be able to handle a large number of orders and display order details in real-time.

System Feature: Shift Order to Deliver (Customer)

Functional Requirements:

1. The system should allow the office employee to access the list of pending orders.
2. The system should allow the office employee to assign a pending order to a designated delivery person provided by the customer.
3. The system should allow the office employee to view the status of assigned orders and update their status as necessary.

4. The system should allow the office employee to communicate with the assigned delivery person regarding any issues or changes to the order.
5. The system should allow the office employee to generate reports on the order delivery status.

Quality Attributes:

1. Usability: The system should be easy to use and navigate for the office employee, with clear instructions on how to assign and track orders.
2. Reliability: The system should be reliable and accurate, with up-to-date information on the status of orders and the availability of delivery personnel.
3. Performance: The system should be fast and efficient, with minimal loading times for order details and status updates.
4. Security: The system should ensure the privacy and security of customer information and order details.
5. Scalability: The system should be able to handle a large number of orders and delivery personnel, with the ability to assign and track orders in real-time.

System Feature: Shift Order to Deliver (Laundry Company)

Functional Requirements:

1. The system should allow the office employee to receive delivery requests from laundry companies.
2. The system should provide the necessary information about the delivery, including customer details, delivery location, and laundry items.
3. The system should allow the office employee to assign the delivery to a specific delivery person from the laundry company.
4. The system should provide a notification to the assigned delivery person about the delivery details and location.
5. The system should allow the office employee to track the delivery person's location and estimated time of arrival.
6. The system should allow the office employee to update the delivery status and notify the laundry company and customer about any changes.

Quality Attributes:

1. Usability: The shift order function should be easy to use and navigate for the office employee.
2. Reliability: The system should ensure that delivery requests are accurate and complete and that the assigned delivery person is reliable and responsible.
3. Performance: The system should be fast and efficient in processing delivery requests and assigning delivery persons.
4. Security: The system should ensure the privacy and security of customer and delivery person data and information.
5. Scalability: The system should be able to handle a large volume of delivery requests and assign delivery persons in real-time.

System Feature: Track (Office Employee)

Functional Requirements:

1. The system should allow office employees to track the status of laundry orders.
2. The system should display real-time updates on the progress of laundry orders, including pickup, delivery, and any delays.
3. The system should allow office employees to view the location of delivery personnel and the estimated time of delivery.
4. The system should provide office employees with notifications of any issues or delays with orders.
5. The system should allow office employees to update the status of orders as they are processed.

Quality Attributes:

1. Reliability: The system should provide accurate and up-to-date information on the status of laundry orders.
2. Usability: The tracking function should be easy to use and provide relevant and timely information to office employees.
3. Performance: The tracking function should be fast and efficient, with minimal loading times for updates and notifications.
4. Security: The system should ensure the privacy and security of order and customer data.
5. Scalability: The system should be able to handle a large number of tracking requests and updates in real-time.

Delivery:

System Feature: View Assigned Deliveries

Functional Requirements:

1. The system should allow the delivery person to view their assigned deliveries.
2. The delivery person should be able to see the details of the delivery, such as the customer's address, contact information, and order details.
3. The system should display the delivery route on a map to help the delivery person navigate to each customer's location efficiently.
4. The delivery person should be able to mark each delivery as completed once it has been delivered to the customer.
5. The system should update the status of the delivery in real-time, so the office employee can track the progress of the deliveries.

Quality Attributes:

1. Usability: The interface for viewing assigned deliveries should be intuitive and easy to use for the delivery person.
2. Reliability: The system should provide accurate and up-to-date information on assigned deliveries and their status.
3. Performance: The system should be fast and efficient in displaying the delivery route and updating the delivery status.
4. Security: The system should ensure the privacy and security of customer and delivery person data.
5. Scalability: The system should be able to handle a large number of deliveries and display real-time updates for each delivery.

System Feature: Update Delivery Status

Functional Requirements:

1. The system should allow the delivery person to update the status of the delivery, such as "en route", "delivered", or "failed to deliver".
2. The system should notify the customer of any updates to their delivery status in real-time.
3. The system should allow the office employee to view the updated delivery status and take appropriate actions if necessary.
4. The system should keep a record of all delivery status updates for future reference and analysis.

Quality Attributes:

1. Usability: The update delivery status function should be easy to use and require minimal effort from the delivery person.
2. Reliability: The system should ensure that the updated delivery status is accurate and reflected in real-time for the customer and office employee.
3. Performance: The update delivery status function should be fast and efficient, with minimal loading times.
4. Security: The system should ensure the privacy and security of customer data and delivery information.
5. Scalability: The system should be able to handle a large number of delivery status updates in real-time.

System Feature: Cancel Delivery

Functional Requirements:

1. The system should allow the customer or the office employee to cancel a delivery.
2. The cancellation request should be processed in real-time.
3. The system should notify the relevant parties (e.g., the delivery person, the customer, and the laundry service) of the cancellation.
4. The system should update the delivery status to "Cancelled" in the database.
5. The system should process any refunds or charges associated with the cancellation according to the company's policies.

Quality Attributes:

1. Reliability: The cancellation process should be reliable and not result in errors or system crashes.
2. Usability: The cancellation process should be easy to use and accessible to both customers and office employees.
3. Security: The system should ensure the privacy and security of user data, including payment information and order history.
4. Scalability: The system should be able to handle a large volume of cancellation requests without slowing down or crashing.

System Feature: View Customer Information

Functional Requirements:

1. The system should allow the delivery person to view customer information such as name, address, and contact number.
2. The system should only display customer information for the delivery that is assigned to the delivery person.
3. The system should ensure the privacy and security of customer data and prevent unauthorized access.

Quality Attributes:

1. Security: The system should have strong access controls and prevent unauthorized access to customer data.
2. Privacy: The system should protect customer data and only allow access to authorized delivery persons.
3. Usability: The system should provide an easy-to-use interface for delivery persons to view customer information.
4. Reliability: The system should provide accurate and up-to-date customer information to the delivery person.

System Feature: Contact Customer

Functional Requirements:

1. The system should allow the Deliver person to view the contact information of the customer for a particular delivery order.
2. The system should provide the option for the Deliver person to contact the customer via phone or message directly from the system.
3. The system should track all communication between the Deliver person and the customer for record-keeping purposes.

Quality Attributes:

1. Usability: The contact feature should be easily accessible and straightforward for the Deliver person to use.

2. Reliability: The system should provide accurate and up-to-date contact information for the customer.
3. Security: The system should ensure the privacy and security of customer data, including their contact information.
4. Scalability: The system should be able to handle a large volume of communication requests between deliver persons and customers.

Laundry Company:

System Feature: View Upcoming Orders

Functional Requirements:

1. The system should allow the laundry company to view a list of upcoming orders that are scheduled to be delivered by a specific delivery person and provide by office employee.
2. The system should display relevant details about each upcoming order, such as the customer's name, order details, and delivery address.
3. The system should allow the laundry company to filter and sort the list of upcoming orders based on various criteria such as date, time, order status, and delivery person.
4. The system should allow the laundry company to update the status of each upcoming order, such as "processing," "ready for delivery," "out for delivery," and "delivered."
5. The system should provide real-time updates to the laundry company and the delivery person regarding any changes in the status of an upcoming order.

Quality Attributes:

1. Usability: The view function should be easy to use and provide relevant and accurate information to the laundry company.
2. Reliability: The system should provide accurate and up-to-date information on upcoming orders and their delivery status.
3. Performance: The view function should be fast and efficient, with minimal loading times for the list of upcoming orders and the order details.
4. Security: The system should ensure the privacy and security of customer data and order information.
5. Scalability: The system should be able to handle a large number of upcoming orders and display them in real-time.

System Feature: Take Order from Deliver

Functional Requirements:

1. The system should allow delivery persons to input and submit orders to the laundry company.
2. The system should allow laundry company employees to view and manage the orders received from delivery persons.
3. The system should enable the laundry company to track and update the status of the orders.
4. The system should provide a notification to the delivery person upon the acceptance of their order.
5. The system should allow the delivery person to view the status of their submitted orders.

Quality Attributes:

1. Usability: The system should be easy to use for both delivery persons and laundry company employees.
2. Reliability: The system should accurately record and manage the orders received from delivery persons.
3. Performance: The system should be fast and efficient, with minimal lag times between order submission and acceptance.
4. Security: The system should ensure the privacy and security of all order information and transaction details.
5. Scalability: The system should be able to handle a large volume of orders from multiple delivery persons simultaneously.

System Feature: Update Order Status for Laundry Company

Functional Requirements:

1. The system should allow the company to update the status of an order after taking the product from the delivery person.
2. The system should present the office employee with a list of delivery persons who are available to fulfill the order, from which they can choose. Additionally, the company must ensure that the selected delivery person receives the product for delivery.
3. The system should allow the company to update the status of an order after shifting the product to the delivery person again.
4. The system should provide an option to select the current status of the order from a predefined list of statuses.

5. The system should send notifications to the delivery person and the customer about the status update.

Quality Attributes:

1. Usability: The status update function should be easy to use and provide relevant and accurate information to the company, the delivery person, and the customer.
2. Reliability: The system should ensure that the status updates are accurate and up-to-date.
3. Performance: The status update function should be fast and efficient, with minimal loading times for the status updates and notifications.
4. Security: The system should ensure the privacy and security of user data, including order information.
5. Scalability: The system should be able to handle a large number of status updates and notifications in real-time.

Customer:

System Feature: User Registration

Functional Requirement:

1. Allow users to create a new account by providing their personal information such as name, email address, and phone number.

Quality Attributes:

1. Security: The system must ensure that the user's personal information is protected and not accessible to unauthorized users.
2. Usability: The registration process should be simple and easy to use for the users.
3. Performance: The system should be able to handle a large number of user registrations simultaneously.

System Feature: Laundry Service Provider Search

Functional Requirement:

1. Allow users to search for laundry service providers based on their location and service type.

Quality Attributes:

1. Accuracy: The search results should be accurate and match the user's search criteria.
2. Performance: The system should be able to retrieve the search results quickly and efficiently.
3. Usability: The search interface should be easy to use and navigate.

System Feature: Laundry Pickup and Delivery Scheduling

Functional Requirement:

1. Allow users to schedule their laundry pickups and deliveries online.

Quality Attributes:

1. Reliability: The system should ensure that the laundry is picked up and delivered on the specified date and time.
2. Usability: The scheduling process should be simple and easy to use for the users.
3. Performance: The system should be able to handle a large number of laundry pickup and delivery requests simultaneously.

System Feature: Laundry Tracking

Functional Requirement:

1. Allow users to track the status of their laundry from pickup to delivery.

Quality Attributes:

2. Accuracy: The tracking information should be accurate and up-to-date.
3. Usability: The tracking interface should be easy to use and navigate.
4. Performance: The system should be able to retrieve the tracking information quickly and efficiently.

System Feature: Rating and Review System

Functional Requirement:

1. Allow users to rate and review laundry service providers based on their experience.

Quality Attributes:

1. Accuracy: The rating and review system should accurately reflect the user's experience with the laundry service provider.
2. Usability: The rating and review interface should be easy to use and navigate.
3. Security: The rating and review system should be protected from fraudulent reviews and ratings.

System Feature: Transparent Pricing and Payment Options

Functional Requirement:

1. Display transparent pricing information for laundry services and provide secure online payment options.

Quality Attributes:

2. Accuracy: The pricing information displayed should accurately reflect the actual cost of the laundry service.
3. Security: The online payment system should be secure and protected from fraudulent activities.
4. Usability: The payment process should be simple and easy to use for the users.

System Feature: Order Management System Feature

Functional Requirements:

1. Allow users to place an order for laundry services by selecting the type of service, laundry items, and quantity.
2. Allow users to specify the pickup and delivery time and location.
3. Allow users to track the status of their order and receive notifications regarding the pickup, delivery, and completion of the order.

4. Provide an option for users to cancel or modify their order before pickup.
5. Ensure that the order details and user information are secure and protected.

Quality Attributes:

1. Reliability: The system must ensure that all orders are accurately processed and fulfilled on time.
2. Performance: The system must be able to handle a large number of orders and users simultaneously without any delay or lag.
3. Availability: The system must be available 24/7 to accept and process orders.
4. Security: The system must ensure the confidentiality, integrity, and availability of user data and transaction information.

System Feature: Order Tracking

Functional Requirements:

1. Provide customers with the ability to track the status of their laundry orders in real-time
2. Allow customers to view detailed information about their order, such as the estimated delivery/pickup time, the status of each item in the order, and any special instructions or notes from the laundry service provider
3. Send notifications to customers when their order status changes, such as when the laundry is picked up, when it is being washed, when it is ready for delivery, and when it has been delivered
4. Allow customers to view a history of their previous orders and their corresponding order statuses.

Quality Attributes:

1. Reliability: The order tracking system should be reliable and accurate, providing customers with up-to-date and correct information about their orders.
2. Usability: The order tracking system should be easy to use and navigate, with clear and intuitive interfaces that allow customers to quickly find the information they need.
3. Performance: The order tracking system should be fast and responsive, with minimal delay in updating the order status or sending notifications to customers.

   Security: The order tracking system should be secure and protect customers' personal and order information from unauthorized access or data breaches.

2.2 UML Diagrams

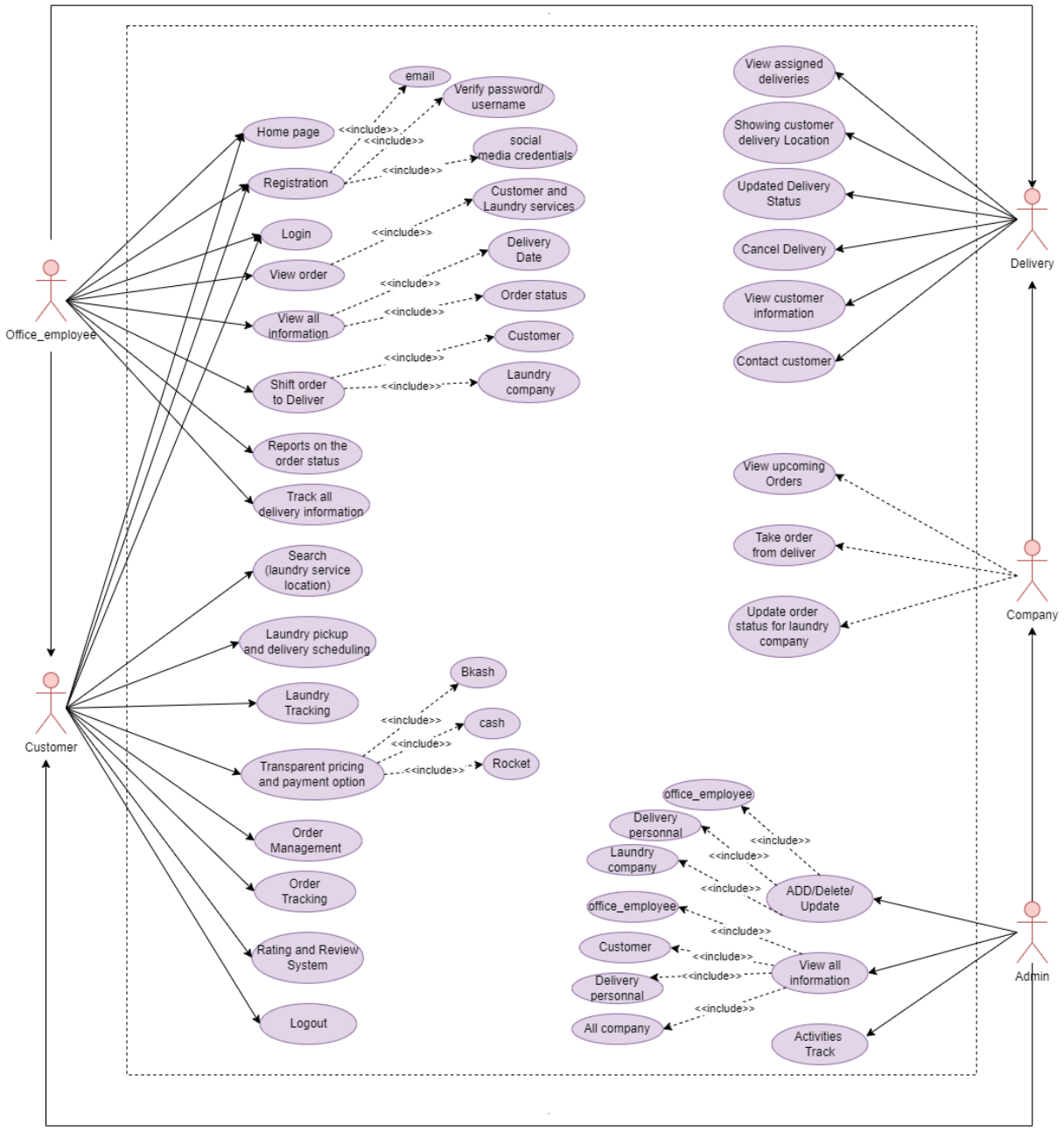

Figure 1: Use -Case Diagram.

In the above use case diagram, there are five actors named Admin, Office Employee, Delivery, Company and Customer. There are a total of 27 to 28 use cases that represent the specific functionality of a laundry management system. Each actor interacts with a particular use case.

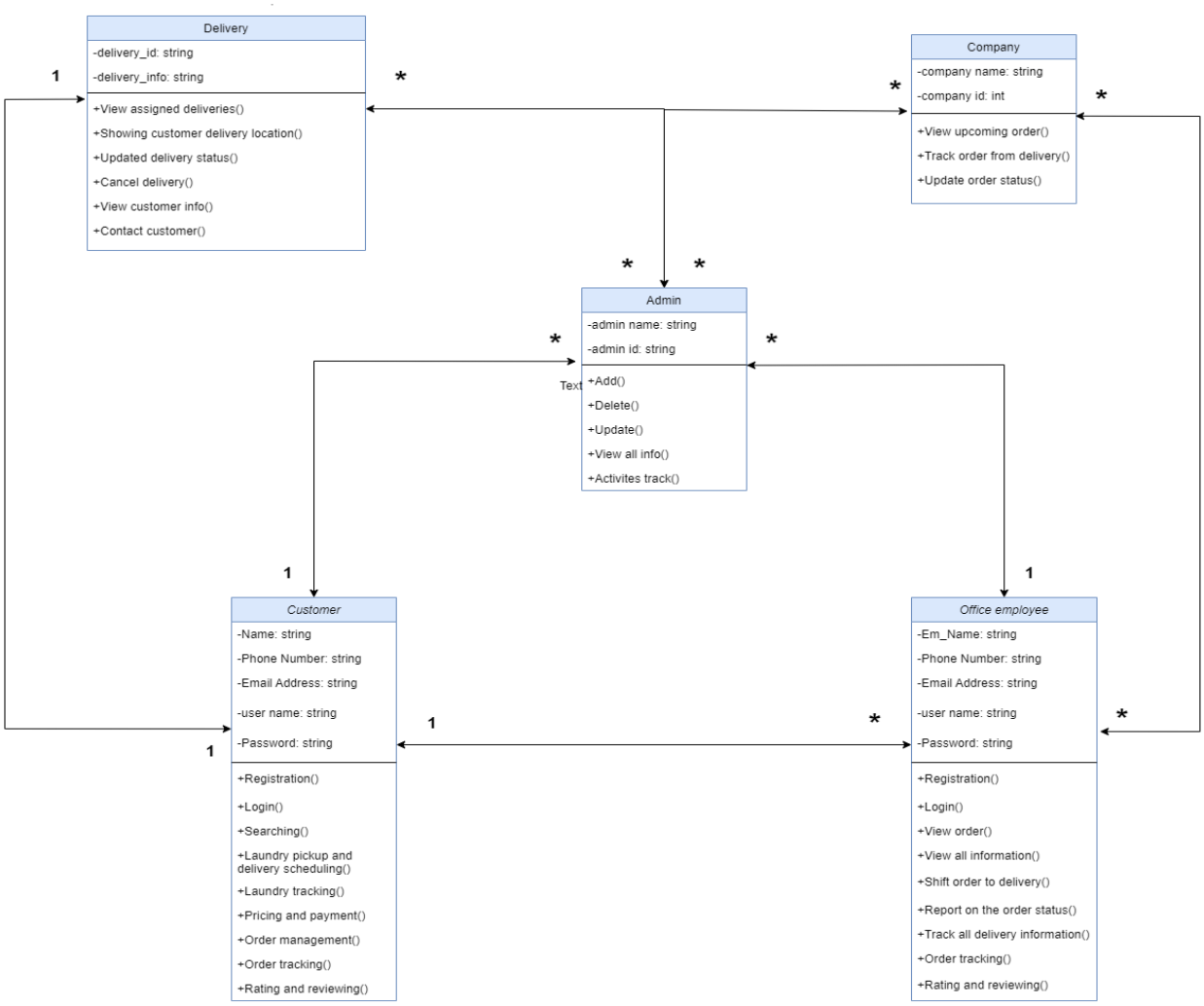

Figure 2: Class Diagram.

The class diagram for a laundry management system represents the different classes and their relationships within the system. The main class in this diagram is the Laundry Management system class, which has attributes such as customers, office employees, admin, company and delivery. It also includes methods to add, remove, and retrieve information about these entities.

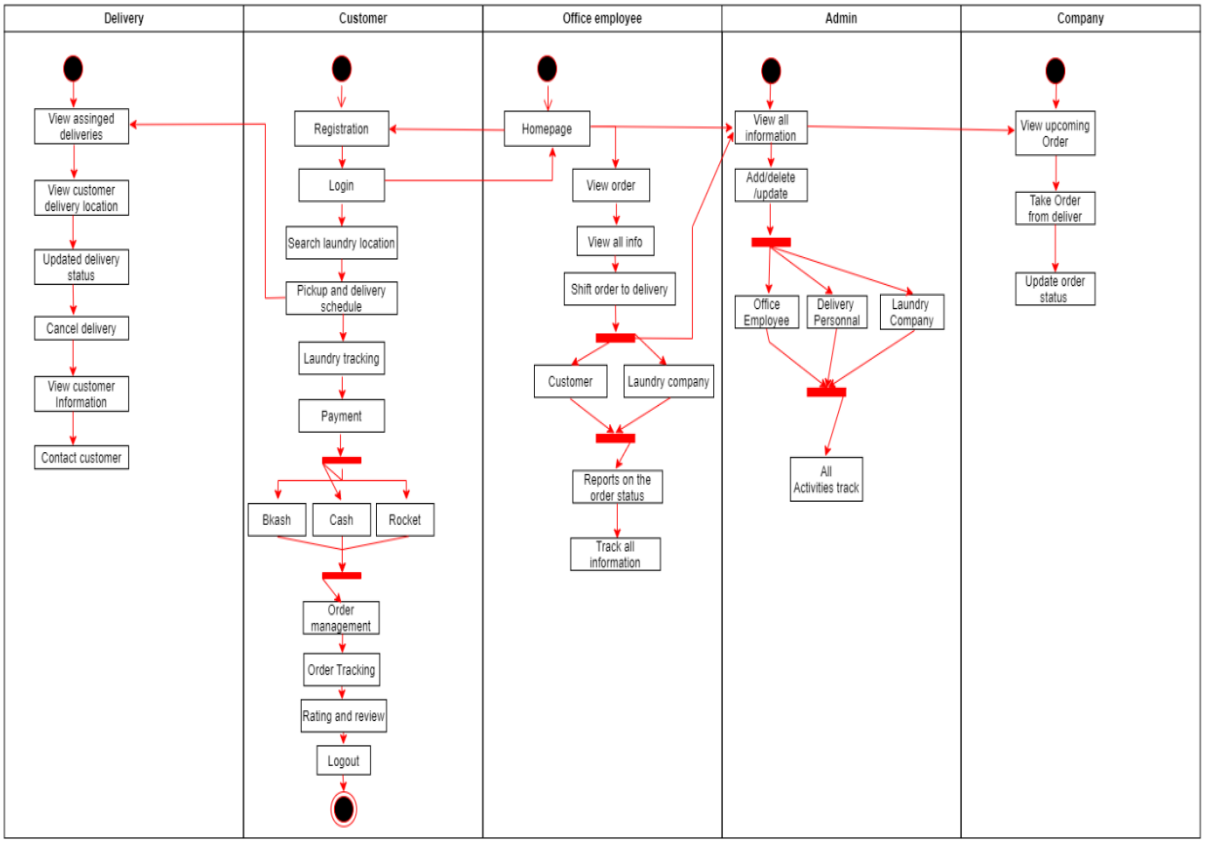

Figure 3: Activity Diagram.

The diagram is about the activity diagram. In this activity diagram, we can see the activity of the laundry Management System where customers have to log in to this website and then check login details and permission. After that customer can go to check the status of the clothes, manage the location, and manage to make payment. Then admin manages the plot, checks records & books, and set work.

3. Social Impact

We are currently working on a project named Laundry Express Project. The adoption of a laundry management system can benefit society in a number of ways. The most important advantage is better hygiene. A laundry management system can improve public health by ensuring that clothing and linens are cleaned and dried at the proper temperatures and with the necessary detergents. This is done through preventing the transmission of illnesses and infections. A laundry management system can also help people, families, and businesses save time by automating the collection, washing, drying, and folding of garments. This could make time available for other pursuits including job, education, and socializing. A laundry

management system can also contribute to waste reduction by optimizing water and energy use, which will enhance productivity and have a favorable effect on the environment. In addition to opening up new career paths for technicians, operators, and maintenance personnel, the introduction of a laundry management system can also assist boost economic growth and lower unemployment rates. Third, a laundry management system can increase access to laundry services for those who might not have access to a washer or dryer, such as those who reside in small apartments or the homeless. Overall, the implementation of a laundry management system can significantly improve hygiene, save time, increase efficiency, create jobs, and increase accessibility to laundry services for a larger range of individuals.

4. Development Plan with Project Schedule

Development Plan:

Projects contain deadlines, spending limits, and specifications that must be met. The project plan is created using agile project planning. Agile project management is made to be adaptable enough to handle tasks that could potentially move, change, or evolve. An agile team can clearly see the objectives of their project thanks to agile planning. We used the iterative and incremental Scrum agile development methodology to create this laundry express software. Scrum is an agile framework created with the user in mind at all stages of the project's development. It is extremely versatile, easy to use, quick, flexible, and efficient.

Scrum's primary goal is to meet the users' needs by creating an environment of open communication, shared responsibility, and continuous improvement. The development process begins with a fundamental understanding of what needs to be constructed, followed by developing a list of characteristics sorted by priority (product backlog) that the product's owner desires.

It’s typically divided in between six to eight steps here we will about the seven steps:

Planning, Requirements and feasibility analysis, Design, Development, Testing, Deployment and Maintenance.

4.1. Planning: In the Planning phase,

- We will discuss about the plan or the steps to achieve our next goal.
- our developers will evaluate the terms of the project.

4.2. Requirements and feasibility analysis: In order to ensure the success of the project, it is important to conduct a thorough requirements and feasibility analysis. This involves

collecting and analyzing information about the system's users, as they will be the ones using the system. To gather these requirements, we will be using questionnaires to gain a better understanding of how our system will function. This process will take approximately one week to complete. Additionally, we will need to determine which features are necessary and which can be omitted, and brainstorm potential solutions to any challenges that may arise. By conducting a feasibility analysis, we can determine whether the application we want to build is viable and cost-effective, and make any necessary changes before design and development begin. This will help us to create a more successful and efficient product in the long run. The brainstorming and analysis process will take at least one to two weeks to complete, ensuring that we have a comprehensive understanding of the project's requirements before moving forward.

4.3. Design: The Design phase models the way a software application will work. Some aspects of the design include:

Architecture – Specifies programming language, industry practices, overall design, and use of any templates or boilerplate.

User Interface – Defines the ways customers interact with the software, and how the software responds to input.

Platforms – Defines the platforms on which the software will run, such as Apple, Android, Windows version, Linux, or even gaming consoles

Programming – Not just the programming language, but including methods of solving problems and performing tasks in the application

Communications – Defines the methods that the application can communicate with other assets, such as a central server or other instances of the application

4.4. Development: The programming phase of software development is where the actual code is written. Depending on the size and complexity of the project, this may be done by a single developer or by multiple teams. During this phase, developers must carefully track any changes to the code and ensure that it remains compatible with other parts of the project. This is especially important for large projects where multiple teams are working on different aspects of the software. By closely monitoring progress and maintaining open communication, developers can ensure that the project stays on track and that target goals are being met. For our particular project, we estimate that the coding phase will take approximately five weeks to complete, allowing us to stay on schedule and deliver the final product on time.

4.5. Testing: Software testing is a critical phase of the software development process that allows us to ensure that the system is functioning correctly and meeting all of the necessary requirements. To accomplish this, we will be running a series of tests that will include both white box and black box testing. Additionally, we will be testing for regression and acceptance to ensure that the system is operating properly and meeting the needs of our users. This testing process is essential to guaranteeing the success of our project and demonstrating the quality of our system. We plan to begin testing after the coding portion of the project has been completed for approximately two weeks. During this time, we will be performing unit testing and integration testing, with the developers responsible for conducting the unit testing. It is crucial to ensure that the system functions correctly during this phase, and as a result, a significant amount of testing is necessary. Any errors that are identified during testing will need to be corrected to ensure that the system meets all of the necessary requirements and functions correctly for our users.

4.6. Implementation and deployment: A crucial step in the software development process, the deployment phase signifies the change from development to actual end-user use. We will launch our application during this phase after performing pre-launch testing to make sure it is prepared for use. This stage is crucial since it specifies how our program will operate before going live, ensuring that it satisfies all prerequisites and works as intended in a practical setting. We will keep a careful eye on the deployment procedure to make sure everything is going as planned and that any problems are immediately found and fixed. Our goal is to provide a seamless experience for our users and ensure that the application is fully functional and ready for use before it goes live. By following a rigorous deployment process, we can guarantee that our application is of the highest quality and meets the needs of our users.

4.7. Operations and maintenance: The maintenance phase is the last stage of the software development cycle. Our application is made available to our clients at this phase and is rolled out for live operation. Even while we work hard to catch any defects and problems during testing, there can still be some that aren't visible until after the application has been used. We will designate resources to sustain the development cycle so that our application stays functional and continues to satisfy the needs of our users. As an alternative, to guarantee that any difficulties are resolved promptly, we can sign a software maintenance agreement with our development team or a third party. This phase is crucial because it ensures that our application continues to function correctly and remains relevant and useful to our users. By maintaining the development cycle, we can ensure that our application remains up to date and that any issues are resolved quickly and efficiently, providing a seamless experience for our users.

Project Schedule:

Planning Phase: Weeks 1-2

Requirements and feasibility Analysis Phase: Weeks 3-4

Design Phase: Weeks 5-6

Development Phase: Weeks 7-20

Testing Phase: Weeks 21-24

Deployment Phase: Weeks 25-26

Marketing Phase: Weeks 27-28

Maintenance Phase: Weeks 29 -53

Phase	Tasks	Timeline (Week)	Date
1. Planning Phase	Define project scope and objectives	Week 1	Day 1-2
	Identify stakeholders and their requirements	Week 1	Day 3-4
	Determine budget and resources	Week 1	Day 5-6
	Create project plan	Week 2	Day 1-3
	Finalize project plan	Week 2	Day 4-5
	Review and approve project plan	Week 2	Day 6
	Conduct a feasibility study	Week 3	Day 1-2

2. Analysis Phase	Conduct a cost-benefit analysis	Week 3	Day 3-4
	Identify potential risks and mitigation strategies	Week 3	Day 5-6
	Determine technical requirements	Week 4	Day 1-3
	Define functional and non-functional requirements	Week 4	Day 4-6
3. Design Phase	Create a wireframe	Week 5	Day 1-2
	Develop a detailed technical design	Week 5	Day 3-4
	Create a detailed project plan	Week 5	Day 5-6
	Create a database design and schema	Week 6	Day 1-3
	Finalize design phase	Week 6	Day 4-5
	Review and approve design phase	Week 6	Day 6
4. Development Phase	Build the front-end and back-end of the application	Weeks 7-10	Day 1-6 (4 Weeks)
	Integrate any necessary third-party services or APIs	Weeks 11-14	Day 1-6 (4 Weeks)

	Perform unit testing to ensure each component functions correctly	Weeks 15-18	Day 1-5
	Conduct code reviews and make necessary changes	Weeks 15-18	Day 6
	Finalize development phase	Weeks 19-20	Day 1-4
	Review and approve development phase	Weeks 19-20	Day 5-6
5. Testing Phase	Perform system testing to ensure the application works as expected	Week 21	Day 1-4
	Conduct user acceptance testing to ensure the application meets the stakeholders' requirements	Week 22	Day 1-5
	Identify and resolve any issues	Week 22-23	Day 6-2
	Finalize testing phase	Weeks 23-24	Day 3 -1 (week 23) - (week 24)
	Review and approve testing phase	Weeks 24	Day -2-6
6. Deployment Phase	Deploy the application to the production environment	Week 25	Day 1-4
	Monitor the application	Week 25	Day 5-6

	and resolve any issues		
	Finalize deployment phase	Week 26	Day 1-4
	Review and approve deployment phase	Week 26	Day 5-6
7. Marketing Phase	1. Market Research 2. Branding 3. Advertising 4. Content Marketing 5. Public Relations	Week 27-28	Day1-6 (2 weeks)
8. Maintenance Phase	Provide ongoing support and maintenance for the application	29 -53 Weeks (6 months)	Days 1-6 (24 Weeks)
	Address any bugs or issues that arise		
	Conduct regular security and performance audits		
	Make updates and improvements as needed		

We are pleased to provide our customers with free maintenance for the first 24 weeks (about 5 and a half months) after the initial deployment of the software application. During this time, our team will be available to address any bugs or issues that arise, as well as perform necessary updates and improvements to ensure optimal performance.

After the initial 24 weeks (about 5 and a half months), we will begin to charge for maintenance services. Our team will work closely with software buyers to develop a maintenance plan that best fits the needs and budget. We are committed to providing exceptional customer support and ensuring the ongoing success of the software application.

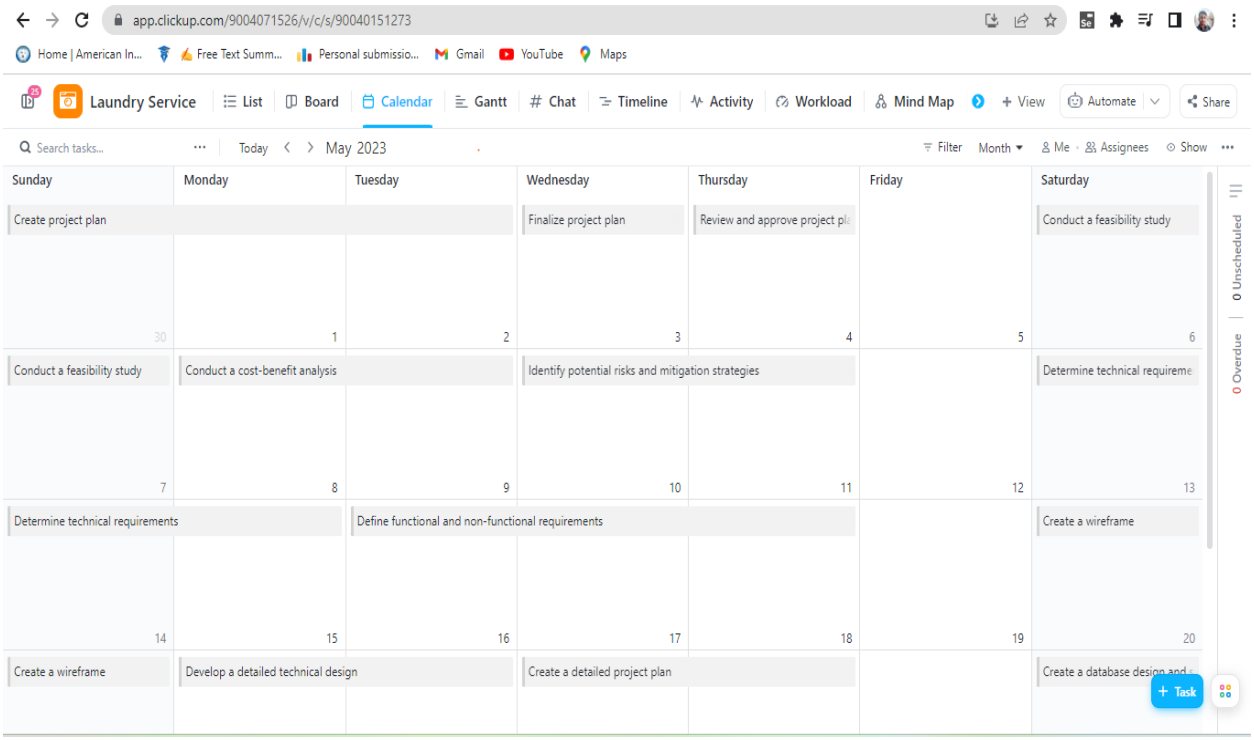

Figure 4: The total Calendar for the Project of Laundry Management System.

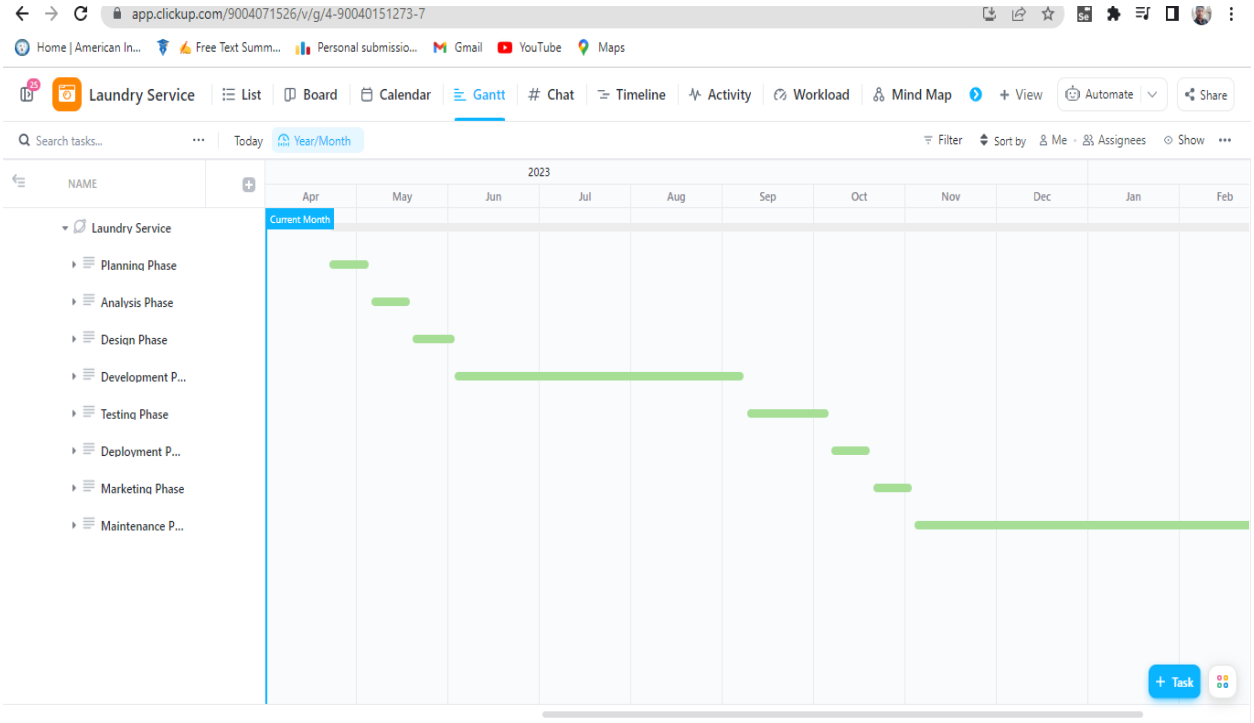

Figure 5: The total Gantt for the Project of Laundry Management System.

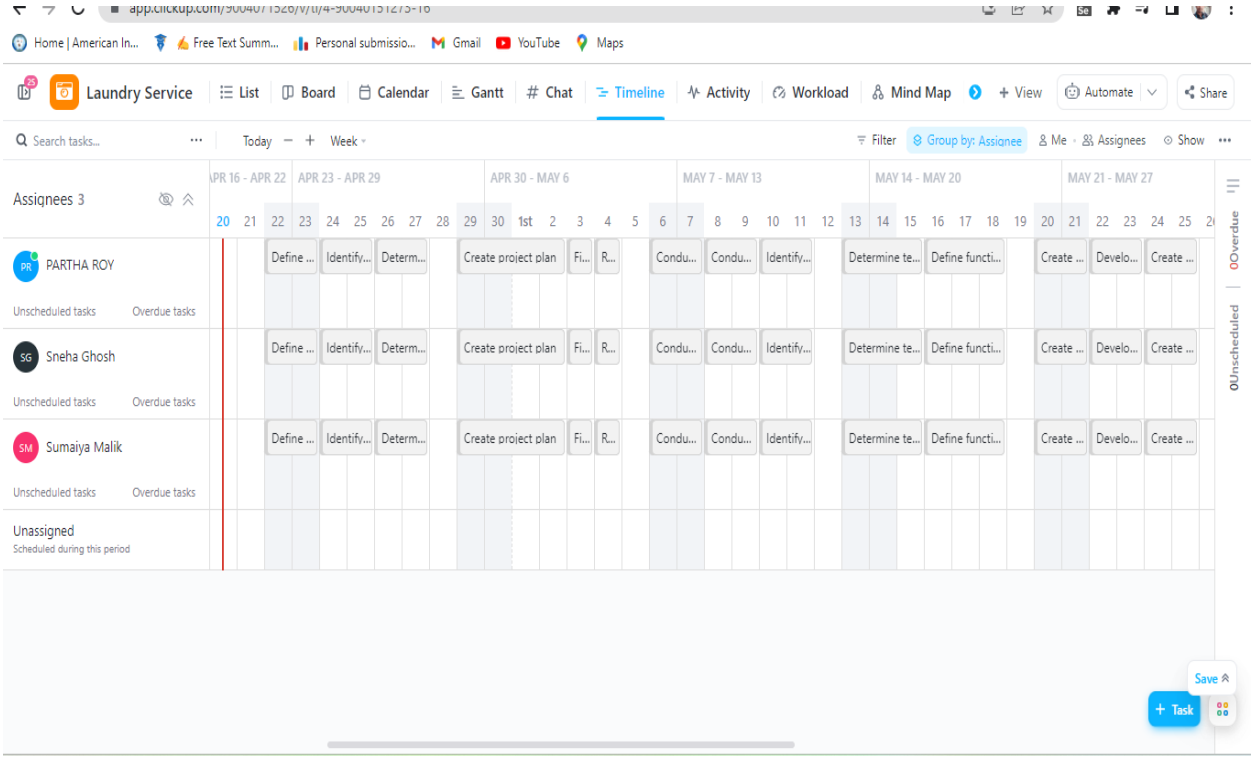

Figure 6: The total Timeline for the Project of Laundry Management System.

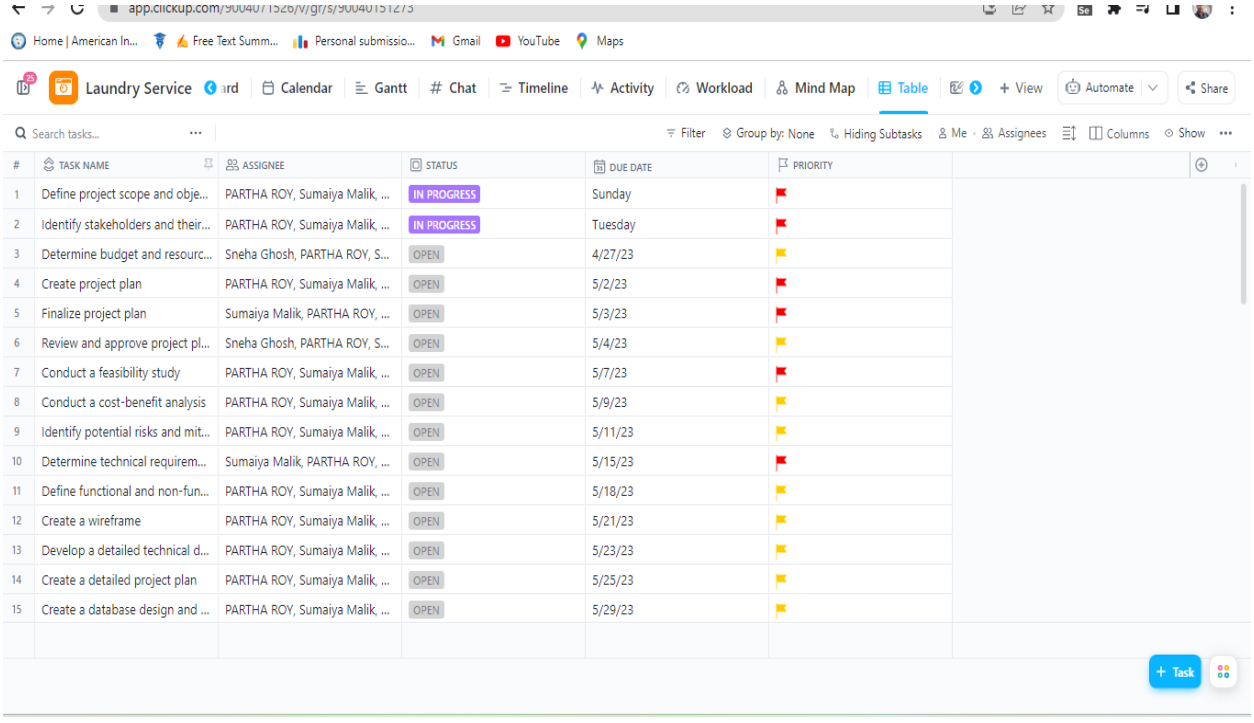

Figure 7: The total Table for the Project of Laundry Management System.

5. Marketing Plan

After building the software or system, we have to make a proper marketing plan to familiarize the software with the people. Marketing plans play a great role to boost in sales. There are many marketing approaches available that we can follow. Traditional and Digital Marketing is one of the popular branches of Marketing. Nowadays Digital Marketing is getting more popular than the traditional approaches of marketing. Marketing plans can be Short-term, long-term and Continuous plan. Describe these plans below

i. **Short-term marketing plan:**

Plans for short-term marketing are intended to provide outcomes quickly and in the here and now. The main objective is to fast boost sales and revenue. These strategies frequently involve quick-acting digital marketing techniques including email marketing, pay-per-click (PPC) advertising, social media campaigns, and others. These strategies are often carried out over a few weeks or months.

Among the short-term marketing strategies that will be used for our software:

- Direct mail (mailing direct to potential customers).
- Newspaper adverts (printing advertisements in newspapers, magazines, brochures, flyers, etc.).
- The billboards (displaying signs along roadsides).
- Outdoor marketing (placing ads in public places like bus shelters, subway stations, etc.).
- Phone marketing (calling people at home using prerecorded messages).
- Internet marketing (advertising online, including websites).
- Trade Expos Special Savings Price reductions for a short period of time.

ii. **Long-term marketing plan:**

On the other hand, long-term marketing plans emphasize accomplishing long-term objectives over a considerable amount of time. These strategies are meant to solidify the brand's reputation, create a devoted following, and expand market share. Long-term marketing strategies frequently include tasks like public relations, influencer marketing, search engine optimization (SEO), and content marketing. These strategies are carried out across several months or perhaps years.

The long-term marketing activities for our software includes:

- Search Engine Optimization (SEO): The implementation of search engine optimization (SEO), a long-term marketing strategy, takes time and effort. It entails knowing who your target market is and configuring your website to

show up for relevant keywords and phrases in search engine results pages. Working with a professional is vital if you want to regularly update and optimize your website for search engines.

- Content marketing: In order to draw in and keep the attention of a clearly defined target, content marketing is a strategic technique that comprises producing and disseminating useful and pertinent material. It's a methodical strategy that can develop leads and build brand authority over time. Short-term, long-term, and continual goals can all be accomplished through the usage of content marketing.

- Social media: A potent marketing tool, social media may be used to accomplish both short-term and long-term objectives. It can be applied to managing online reputation, participating in online communities, and raising brand recognition among prospective buyers. Frequent social media updates can assist keep our brand in the public eye and offer your audience useful information. Social media is an ongoing strategy that can aid in gaining a devoted following over time.

  Online communities on social media platforms like Facebook, Twitter, Instagram, LinkedIn, and others can help us draw in top talent and build brand recognition among potential clients. By consistently appearing in users' social news feeds, we may retain their attention. Curiosity is piqued by interesting posts. People remember helpful advice and the source of it.

iii. **Continuous Marketing Plan:**

Plans for continuous marketing entail consistent, ongoing marketing activities. These strategies are crucial for preserving a dominant market position and guaranteeing that the software or system continues to be pertinent to the intended audience. Examples of ongoing marketing initiatives include social media maintenance, content production, and email marketing. These strategies are carried out indefinitely, frequently with periodic evaluations and adjustments to make sure the marketing initiatives continue to be successful.

Examples of conventional media include print, television, and radio. Whether it's billboards on the side of the road or online advertisements for our laundry express, advertising is thought of as an indication of the good or service.

6. Cost and Profit Analysis

PROJECT ESTIMATION

An algorithmic software cost estimating methodology is the Constructive Cost Model (COCOMO). We will be using an organic software project type. It is a software project that must be worked on in a hardware-dependent environment.

Constructive Cost Model

We are assuming that the SLOC (Source Lines of Code) that we require here after analyzing all the components.

SLOC = 35,000

Now we need to figure out the effort, development time, and required number of people.

Suppose that, our software project type is organic, the values of the Coefficient<Effort Factor> =2.5

P = project complexity = 1.25

SLOC= 35,000

T= SLOC-dependent coefficient = 0.40

Now,

Effort = PM = Coefficient*(SLOC/1000) ^{P}

PM = $2.5*(35000/1000)^{1.25}$

= 212.83

Development Time= DM= $2.5*(PM)^{T}$

= $2.5*(212.83)^{0.40}$

= 21.34

= 22 [In months]

Required Number of People = ST

= PM/DM

= 212.83/21.34

= 9.97

= 10

Total Development time: 22 months

Total working hours needed: (22*22) *8= 3,872hours; (1 month = 22 working day & per day working time 8 hours)

Requirement analysis & Documentation times needed: 22*22=484 hours

Times needed for Ui/UX designing: (2*22) *22=968 hours

Times needed for developing system: (7*22) *22= 3,388 hours

Times needed for Testing & Debugging: (3*22) *22= 1,452 hours

Revision time: (2*22) *22= 968 hours.

For develop the software:

- Developer team of 5 engineers.
- Software Quality assurance team of 2 engineers.
- One Business Analyst
- Two Ui/UX Designer
- Total budget: **5,500,000 BDT**

Cost and Profit Analysis

Cost Analysis

Project Name: Laundry Management System

SL	Designation	Total Hours	Per day Salary	Resource Unit	Total Cost (BDT)
1	Developer	3388	250	5	4235000
2	SQA Engineer	1452	200	2	580800
3	Ui/UX Designer	968	150	1	145200
4	Business Analyst	484	300	2	290400
	Total Cost				**5251400**

Now, All together

Project Name: Laundry Management System

SL	Cost Item	Total Cost(BDT)
1	Requirement Cost	
2	Design Cost	145200
3	Development Cost	4235000
4	Testing Cost	580800
5	Business Analyst Salary	290400
6	Staff's Salary	100000
7	Maintence Cost	20000
8	Review Cost	10000
9	Market Promotion Cost	100000
10	Launching Website Cost	40000
	Total Cost	**7021400**

Profit:

Those who will use their grave space in the cemetery have to buy a maintenance cost. We set our monthly maintenance rate at 250 BDT. We are assuming at least 2550 people will use our app.

So, 2550 X 250 = 637,500 BDT

So, in 22 months it will be 637500 *22 = 14025000 BDT

Our Total Development cost = 7021400 BDT

So, earnings on this website = 14025000 BDT

So, we are getting (14025000-7021400) = 7003600 BDT profit. After one-year subscription fee will be reduced.

7. Reference

- Draw.io(https://app.diagrams.net/)
- Elaundry(https://www.elaundry.com.bd)
- Dhopaghat(https://www.dhopaghat.com)
- Hello Laundry (http://hellolaundry.com.bd)