Task1: Preliminary Investigation

Project Identification

Dry cleaning is a process that involves use of solvents in order to remove stains and dirt from clothes, and ironing of those clothes. This system has been done manually in which people take their clothes to dry cleaners. This process can be hectic and may lead to poor service, not delivering the clothes on time and not easy for the dry cleaner to identify whose clothes are for which customer.

With this, we came up with a Dry cleaning system which will solve the above problem.

System Request

Project Sponsor

Members of group 18.

Business Need

The dry cleaning business needs a convenient and efficient platform for customers to order pick-up laundry services and for dry cleaners to manage and fulfill these orders. The current system of dry cleaning is time-consuming, lacks sufficient communication between the business and customers, and can be stressful for customers during pick-up and drop-off times

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Business Requirements

The mobile application will allow customers to book pick-up laundry services, view the status of their orders, and see all the services offered by the dry cleaners. The dry cleaners will be able to manage orders and communicate with drivers, who will use the app to pick up and deliver laundry.

Business Value

The mobile application will provide several benefits to the dry cleaning business and its customers, including:

- Increased efficiency and convenience for customers ordering pick-up laundry services
- Improved communication and coordination between customers, dry cleaners, and drivers.
- Increased productivity for the dry cleaning business through the elimination of manual cataloging and searching for customer's clothes.
- Increased customer satisfaction through accurate and timely delivery of services

Special Issues

- Security and privacy of customer and order information must be ensured
- The app must be user-friendly and operate in a hardware and software environment compatible with Android and iOS smartphones.
- The app must have a reliable and available system, even if the system fails, with manual backup options.

Feasibility Report

Technical Feasibility

The dry cleaning system is technically feasible because it uses all the familiar technologies like real time tracking(streaming), cloud storage(database) and online payment.

Though it comes with some constraints, regarding the familiarity of the application is moderately high

- The IT department has knowledge on streaming and database
- The team is familiar with how the dry cleaning is done manually.
- It's not a new system so awareness has to be done before the system is delivered to the end users

The risks with regarding the technology is moderately low

- The IT department is familiar with all the technologies which are streaming, database and online payment.
- The equipment are familiar to use e.g use of ordering applications

The risk with regarding the size of the project is considered medium

- The project team will consider only the members of group 18
- Dry cleaners involvement will be required
- The time frame is somewhat critical because it's a new system and will take a while before people get use to it

The compatibility of the project is considered compatible because of the real time data sharing and online payment which can be done through third party services.
Economic Feasibility A cost benefit estimate was performed and from the this, the dry cleaning application will: • Increase the sales of the dry cleaners and the company. • It will increase customer satisfaction • It will reduce the cost of lost of clothes because all the records of dry cleaning will be saved in a cloud database
Organizational Feasibility From an organizational perspective, this project has low risk. The dry cleaners will really appreciate the system because of their ability to receive payment from the application. The users of the system are expected to appreciate the entry of the dry cleaning system because it will give our customers the ability to track the status of their clothes and it will increase the sales of the dry cleaner because of the transparency of the system. This system will prevent customers from loss of clothes or misplacement of their clothes. It will also prevent dry cleaners from not receiving their payment or delay of payment by customers.

Task2: Planning

Work Plan

The work plan should indicate the following task:

1. Documentation of system request and feasibility report
2. Choosing a suitable elicitation technique
3. Designing the questions that will be used in the process of gathering requirements
4. Outlining the functional, non-functional, user, system and operational requirements
5. Design of use cases
6. Selecting a suitable SDLC model
7. Design of the system

ID	Task Name	Assigned To	Estimate		
			Duration	Start	Finish
1	Feasibility Study (Business need)	Yusif Muhammad Zakar	1 Week	12/02/23	19/02/23
2	Feasibility Study (Business Requirement)	Kelechi Okorie Jennifer			
3	Feasibility Study (Business Value)	Abubakar Shehu Usman			
4	Feasibility Study (Special Issues)	Al-Amin Suleiman Daud			
5	Elicitation Analysis (Technical Feasibility)	Ahmad Mijinyawa	5 days	20/02/23	25/02/23
6	Elicitation Analysis (Economic Feasibility)	Micheal Otohinoyi Onoruoiz			
7	Elicitation Analysis (Organizational Feasibility)	Muhammad Saeed			
8	Requirements (Functional)	Abubakar Muhammad Shehu	5 days	26/02	02/03
9	Requirements (Non-functional)	Ishaq Usman			
10	Requirements (System)	Bala Sulaiman Abubakar			
11	Requirements (User)	Ibrahim Yahya			
12	Requirements (Business)	Nasir Musa Shehu	1 week	03/03	09/03
13	Use Case Analysis (Use case 1)	Sadiq Usman Goni			
14	Use Case Analysis (Use case 2)	Nazeef Adam Mustapha			
15	Use Case Analysis (Use case 3)	Usman Salisu Gwadabe			
16	Design (Hardware/software requirement and user interface design)	Musa Jibril	1 week	10/03	16/03

17	Design (System acquisition and architecture design)	Muhammad Mansur			

Task3: Requirement Determination

As a requirement elicitation technique, we decided to go for the interview and questionnaire approach in order to determine requirements for dry cleaning application which we gathered functional, non-functional, system, user and business requirements.

We interviewed a professional dry cleaner at coke village on 20th February and some of the interview questions were:

1. What kind of items do you plan on offering for dry cleaning?
2. How many different kinds of fabric do you anticipate needing to handle?
3. What are the different cleaning options you plan to offer(dry cleaning, spot cleaning etc)?
4. How do you currently manage customer orders and billing?
5. Are there any specific timeframes or deadlines that need to be met for orders?
6. How do you handle dry cleaning that are urgently needed?
7. Are there any compliance or regulatory requirements that need to be considered in the development of this application?

Functional Requirements

1. User registration and login: Users should be able to create accounts and log in to the application with their email addresses and passwords.
2. Order creation: Users should be able to create orders for dry cleaning services, specifying the type of items they need to be cleaned, their preferred pickup and delivery times, and any special instructions.
3. Pickup and delivery scheduling: Users should be able to schedule pickups and deliveries of their orders, specifying the pickup and delivery addresses and times.
4. Payment processing: The application should allow users to make payments for their orders using various payment methods such as credit cards, debit cards, and online wallets.
5. Order tracking: Users should be able to track the status of their orders in real-time, from pickup to delivery.
6. Notifications: Users should receive notifications about their order status, payment processing, and delivery times.
7. Customer support: The application should provide customer support through various channels such as email, chat, and phone, to address any issues or concerns that users may have.

8. Special requests: Users should be able to make special requests for their orders, such as rush delivery or eco-friendly cleaning.

Non-Functional Requirements

1. Reliability: the system should be able to authenticate users and dry cleaners accurately and consistently.
2. User Friendly Interface: The system should be simple and easy to use.
3. Security: The system should be secured and protect users data from third party access.
4. Efficiency: The system should be able to give a real time update of the status of your clothes fast and accurately.
5. Scalability: The system should be able to accommodate potential growth in the number of customers services offered

System Requirements

1. The system should be available for users with either android and iOS devices
2. The application should be able to handle large volumes of user requests, and provide quick response times, even during peak usage hours.
3. The application should be able to integrate with other systems, such as payment gateways, order management systems, and customer relationship management tools.
4. The application should be localized to support multiple languages and cultures, depending on the target user audience.
5. The application should be easy to maintain, with regular updates and bug fixes, and have a dedicated team of technical support personnel to address any issues that arise.

User Requirements

1. Users should be able to schedule pickups and deliveries at their preferred times and locations.
2. Pricing: Users should be able to see transparent pricing for the services offered, and be able to make payments using various payment methods.
3. Users should be able to track the status of his clothes in real time.
4. Users should be able to report missing clothes or any inconveniences regarding their clothes.
5. Users should feel confident that their items are safe and secure while in the care of the dry cleaning service, with appropriate insurance and security measures in place.

6. Users should be able to access the application and its services at any time, from any location.
7. Users should be able to rate and provide feedback for services received.

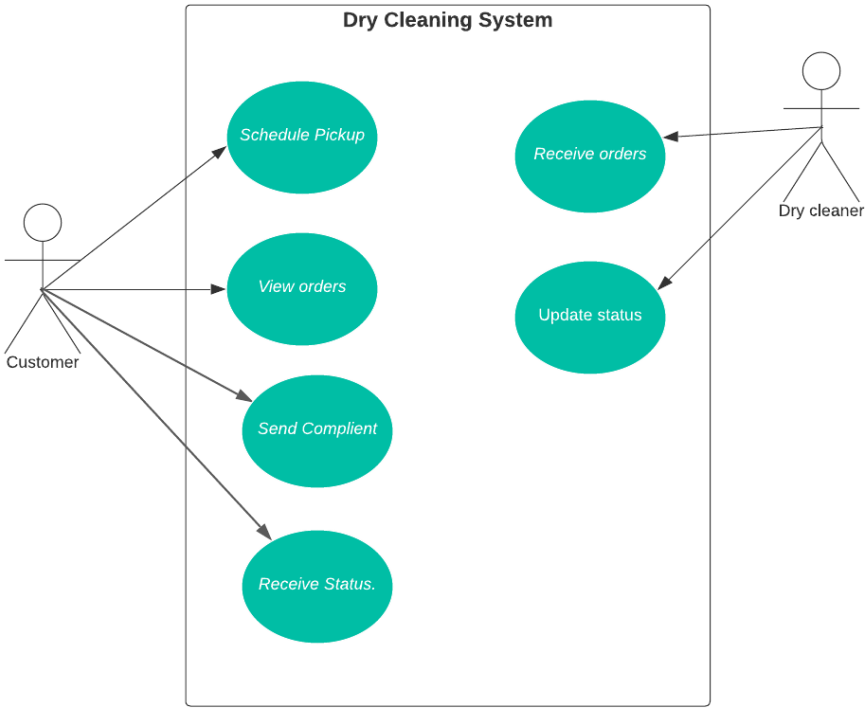
Business Requirements

1. The application should generate revenue through various business models such as subscription fees, commission fees, or transaction fees.
2. The system will reduce the vulnerability of clothes to loss and misplacement.
3. The application should aim to capture a significant market share in the dry cleaning industry, by providing high-quality services and exceptional customer experience.
4. The application should have the potential for growth and expansion into new markets, either through geographic expansion or by offering additional services such as garment repair or alteration.

All the above requirements will be used in the designing and implementing the dry cleaning application.

Task4: Analysis-Use Case

A use case diagram for dry cleaning application can be illustrated as follows:



After gathering our requirements, the 3 major use cases for Dry cleaning application are:

Use case 1: Schedule pickup.

Use Case Name: Schedule Pickup
Actor: Customer
Description: A customer has some clothes to be washed, he needs to make a request for dry cleaning service and schedule for pickup.
Priority: High
Tigger: Customer clicks on the "Request Dry Cleaning and Pickup" button on the company's mobile app.
Preconditions: • A customer downloads the application on their device. • The customer authenticates himself. • The customer has access to the clothes that need to be cleaned and is ready to schedule a pickup. • The customer is within the dry cleaning service area for the dry cleaning and pickup.
Normal Course: • The customer navigates to the "Request Dry cleaning" section of the application. • The application displays a form for the customer to enter their pickup and delivery information, including the pickup date, time, and location, the delivery date, time, and location, and any special instructions. • The customer enters the required information into the form and submits it. • The application confirms the pickup details and displays a summary of the order, including the estimated cost and expected delivery date • The customer reviews the order summary and confirms the order. • The system notifies the available dry cleaner of a dry cleaning pick-up request. • The dry cleaner service confirms the pickup request and sends a confirmation message to the customer, including the pickup time and a unique order number.
Alternative Course: • If the customer needs to reschedule the pickup, they can navigate to the

"Schedule Pickup" section of the application and modify the pickup and delivery details. • The user changes the pick-up date and location and can wish to change other fields • The application confirms pick-up details and displays order information. • The customer reviews the order summary and confirms the order. • The system notifies the available dry cleaner of a dry cleaning pick-up request. • The dry cleaner service confirms the pickup request and sends a confirmation message to the customer, including the pickup time and a unique order number. • If the customer has any issues with the order or needs to contact customer support, they can navigate to the "Help" section of the application and contact customer support via phone, email, or chat.
PostConditions: • On the scheduled pickup date and time, the pick-up/delivery service arrives at the customer's location and collects the items to be dry cleaned. • The pick-up/delivery service transports the items to their facility and the cleaning process is done and scheduled for delivery. • The cleaned items are delivered by the pick-up/delivery service back to the customer. • The customer receives the cleaned items and confirms the order has been fulfilled.
Exceptions: When all dry cleaners are not available • The system displays message “Dry cleaners are not available pls request again ” • The system asks the user to make another request or exit the application

Use case 2: Status Update.

Use Case Name: Status Update
Actor: Dry cleaner
Description: When the dry cleaner receives the clothes, he needs to send a real time update of the status of the clothes to the customer such as "cleaning," "drying," "completed," or "ready for pickup."
Priority: High
Tigger: Employee logs in and selects "Update Clothes Status" from the menu.

Preconditions:

- A customer requests for a dry cleaning service.
- The pick-up/delivery service has pick-up the clothes and delivered them to the dry cleaner.
- The dry cleaner has received the clothes from the customer and has entered the relevant information into the system.
- The system is properly set up and functioning, with no technical issues that would prevent the dry cleaner from updating the status of the clothes.
- The dry cleaner has access to the system and has the necessary permissions to update the status of the clothes.

Normal Course:

- The customer navigates to the "Orders" section of the application.
- The application displays all orders he has accepted with orderID, date and customer's details.
- The dry cleaner selects the order and from received to either washing, drying, ironed or packaged.
- The application sends the update to the customer.

Alternative Course:

- When something happened to the clothes along the way.
- The dry cleaner heads to damages and fills out a form with a description of what happened to the clothes with a picture.
- The dry cleaner submits the damage report and notify the customer.
- The customer gets some compensation for his damaged clothes.

PostConditions:

- The customer gets notified about the current status of his clothes.

Use case 3: Receive Status.

Use Case Name: Receive Status

Actor: Customer

Description: When the customer's clothes have been delivered to the dry cleaner, he needs to send a real time update of the status of the clothes.

Tigger: A dry cleaner updates the status of the customer's clothes.

Preconditions:

- The customer's clothes status has been updated by the dry cleaner.
- The customer has provided accurate contact information, such as a phone number or email address, for receiving the status updates.

Normal Course: • The customer navigates to the "Orders" section of the application. • The application displays all orders he has scheduled with orderID and status of either washing, drying, ironed or packaged.
Alternative Course: When a customer does not receive an update for a week . • The customer sends a complaint to the support team about the issue with information about the order. • The customer submits the complaint report to notify the support team. When a customer gets a damage request • He navigates to “Damages” section and see what happened to his clothes • He receives his compensation
PostConditions: • The customer gets notified about the current status of his clothes.

Task5: System Design

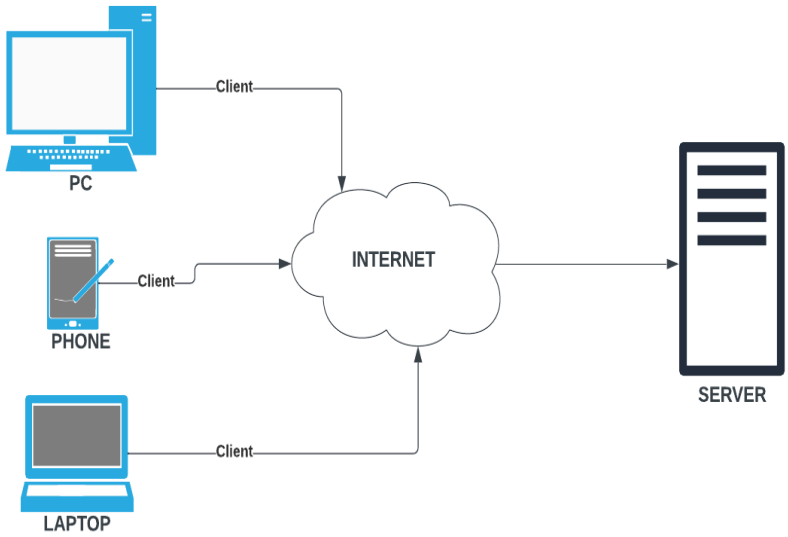
System Acquisition

The best system acquisition to use for dry cleaning application is the **Custom Development** because:

- There is no similar application in the marketplace (Business need is unique).
- The team has technical experience.
- The team has a skilled project manager.
- The time frame is flexible which is enough for the technical to develop the system.

Architecture Design

Based on our non-functional requirements,the best-fit architecture is the **CLIENT-SERVER** Architecture. The server will store all dry cleaning orders, user information and other relevant information. The client will access all the information via the internet and the real time order status can only be accessed when the client is connected to the internet.



Hardware and Software Requirements

Operating System

- The Operating system to be used for the client will be Android and iOS operating systems.

Special Software

- Payment gateway: This is a software that will provide a way for the customer to make payment, receive payment and manage sales by the dry cleaner.
- Real-time tracking software: Socket.io will be used for the realtime information tracking and the tracking of the status of the customer's clothes in real time.
- Route management Software: This software will be used by the pickup/delivery service to track the customer's location, distance and traffic.
- Database Management System: The recommended database to be used is a NO-SQL database which is MongoDB.
- Cross platform mobile framework : The user interface to be used for the application is Flutter.

Hardware

- Barcode scanners: Barcode scanners can be used to track garments throughout the cleaning process. This can help to ensure that garments are returned to the correct customers and can help to reduce errors and lost items.

- Mobile device: The customers and the dry cleaner needs an android or iOS device to install and use the application.

Network

- The recommended network to connect the client and the server is the starlink satellite network.

User Interface Design

The user interface will be a mobile application based that can be accessed by dry cleaners and customers. This are some of the component:

Dry Cleaning User Interface design

Musa Jibril | April 23, 2023