

# Final Year Project

## ScrapHub



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## **Abstract**

ScrapHub would provide a platform that connects sellers, collectors, and buyers. The aim of project is to achieve the sustainable Environment. Our platform will help to collect and recycle the scrap. Because scrap is being used extensively in the construction industry in projects such as roads and bridges etc. Scrap metal recycling helps reduce CO<sub>2</sub> emissions from pollutants like cars, factories, and electricity generation, transmission, and distribution Pakistan is the world's 4th largest scrap steel importer. Pakistan generates 20 million tons of solid waste tons every year. Pakistan increasing 2% scrap every year. Our system will help to save energy and raw materials.

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**Revision History**

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## 1. Introduction

Nowadays individuals and organizations generate a lot of scrap including plastic, paper, and metals. This scrap is polluting our environment and damaging our society. And people are unaware that things are recyclable and pay well prices (make money out of anything & everything). The main purpose of our project is to create a sustainable environment by recycling scrap. ScrapHub would be a platform that connects 5 entities. Those entities are Homes, Hawkers, Institutions, Recycling companies and industries.

## 2. Vision Document

In this section, project vision is discussed in detail.

### 2.1 Problem Statement

The Generating of millions of tons of scrap cause climate pollution, our system will provide the platform to sustainable environment, details of problem statement is given in Table.

Table 1: Problem Statement

Problem of	According to EPA Pakistan generate 20 million ton of scrap a year and 2 percent increasing every year [1].
Affects	Scrap is cause of air, water, and soil pollution, which are led to climate change.
Impact of which	Collection of scrap is time consuming. Public are unaware of scrap recycling advantages.
Successful solution would be	People will get a single platform where seller, collector and buyer of scrap get benefits. Management and recycling of scrap will be easy, it will help to achieve the sustainable environment.

## **2.2 Business Opportunity**

There are different types of scraps like metals, plastic, and paper, which are recycled able. So, automating the scrap collecting and recycling system would be a great business opportunity for creative entrepreneurs who want to start a recycling business. ScrapHub will provide an easy way to sell and purchase scrap. There is no current proper online scrap sale system yet, it will help the recycling companies to get scrap easily. ScrapHub will help to better the economy of our country.

## **2.3 Objectives**

This system sets the following objective to:

- Develop digital platform where people can come to sell and buy the scrap online.
- Collect and recycle the scrap and keep this valuable material in the loop.
- Create a sustainable environment in the country.
- Reach the maximum scrap customer at the right time to increase sales and profitability.
- Connect the local supply with global demand, which will help in a better economy.

## **2.4 Scope**

ScrapHub is an android and web application. ScrapHub team will develop the mobile application that helps the user to sell scrap, schedule picks up, and get paid through the app. An Interface of application will be provided to the Collector to work with us. A web application will show the scrap product with the description, and the buyer will buy the scrap from them. ScrapHub will provide an environment through which scrap sellers, buyers, and collectors would be able to build a strong connection with each other. ScrapHub is a step towards saving the earth's environment, earning profit out of your waste.

## **2.5 Constraints**

- The information of all the users and scrap materials must be stored in a centralized database.
- Multiple users can use this system at a time.
- Users may access from any computer and mobile that has internet connection.
- Users must have a valid contact number to register on the application.

## **2.6 Stakeholder and User Description**

Stakeholder and User Descriptions are defined in detail below.

### **2.6.1 Market Demographics**

Our target market is Homes, Hawkers, Institutions, Recycling companies and industries. Aim to provide a single platform from there they can connect easily. Every year 2% scrap increased. So, our platform provides an easy way to manage and recycle the scrap. It can be used on a global level.

### 2.6.2 Stakeholder Summary

Stakeholder summary details provided in Table 2.

Table 2: *Stakeholder Summary*

Name	Description	Responsibilities
ScrapHub Developers	It includes those who are involved in designing and implementing of this project.	<ol style="list-style-type: none"><li>1. Should design android and web application.</li><li>2. Proper testing should be applied.</li></ol>
End-User	End users include Scrap Seller, Collector, Buyer include the recycling companies.	<ol style="list-style-type: none"><li>1. Should have knowledge of using android phone and web browsers.</li></ol>
Supervisors of project	Supervisor will be stakeholders of this product as they are involved in development process of this project with the development team.	<ol style="list-style-type: none"><li>1. Gives direction to project development team.</li><li>2. Ensures that the system will be Reliable.</li><li>3. Ensures that there will be a market demand for the product's features.</li><li>4. Monitors the project's progress.</li><li>5. Ensures that project is following the documents.</li></ol>

### **2.6.3 User Environment**

Any user with an internet connection will be able to access the website. End-users must have knowledge of using an android mobile and other basic information to install and operate any application and website. Plogging drive will helps the user how to use our system and proper user interface and installation guidelines must be provided to educate the users on how to use the application and website without facing any problems. It is an android application and website so it must operate on all the specified android phones or computer devices.

## 2.6.4 Stakeholder Profiles

The Stakeholder Profiles Attributes of the system are listed in this section.

### 2.6.4.1 Supervisor for Project

The supervisor is the stakeholder of this project, the details are in Table 3.

Table 3: *Supervisors of the Project*

Representatives	Supervisor: Dr. M. Fayyaz
Description	They are involved in supervising activities of development process
Type	They are technical stakeholders. They have expertise in domains which are being applied to this project i.e., web development.
Responsibilities	<ol style="list-style-type: none"> <li>1. Gives direction to development team.</li> <li>2. Ensures that the system will be maintainable.</li> <li>3. Ensures that there will be a market demand for the product's features.</li> <li>4. Monitors the project's progress.</li> <li>5. Ensures that project is following the documents generated during project planning and work products are properly delivered.</li> <li>6. They will facilitate development team to complete this project within specified resources.</li> </ol>
Success Criteria	The completion of features which are being committed by development team at start of the project.
Involvement	<ol style="list-style-type: none"> <li>1. Requirement reviewer</li> <li>2. Senior project manager</li> <li>3. Reviews implementation</li> </ol>
Comments/Issues	None



#### 2.6.4.2 Development Team of Project

Development Project team details are in Table 4.

Table 4: *Development Team of the Project*

Representatives	M. Rizwan M. Umair M. Saqlain
Description	They are involved in designing of app.
Type	They are technical stakeholders.
Responsibilities	<ol style="list-style-type: none"> <li>1. Should design this app considering user's needs.</li> <li>2. Proper testing should be applied to make it as effective as possible.</li> <li>3. Gathering proper data about project for better recommendations</li> </ol>
Success Criteria	The completion of features which are being committed by development team at start of the project.
Involvement	<ol style="list-style-type: none"> <li>1. App developer</li> <li>2. Web developers</li> <li>3. Testers</li> </ol>
Deliverable	<ol style="list-style-type: none"> <li>1. Documentation</li> <li>2. Data acquisition</li> <li>3. System Training</li> </ol>
Comments/Issues	None

### **3. System Requirements Specification**

System requirements specification outlines the detailed requirements of a software system or a project. It serves as a foundation for software development, providing a clear understanding of what the system should accomplish and how it should function.

#### **3.1 System Features**

The following are features of our ScrapHub system.

- User Registration
- Schedule Scrap Pickup
- Find Nearest Yard
- Inventory and Yard management
- Leads Management
- Points to Collector
- QR Code
- Bidding
- Payments

#### **3.2 Functional Requirements**

The functional requirements of the system are listed below.

##### **3.2.1 User Registration**

Every home user, scrap collector, shopkeeper, hawker, industry and recycle company will register themselves directly or indirectly. Users will be registered with an application via a contact number and password. The application generates OTP to authenticate hawkers. Every hawker and scrap collector will be registered by the administrator.

##### **3.2.2 QR Code**

Generated, the QR code will make an entry in an online database. It will include details such as time and date, household number, and scrap weight. The collector will come and generate a QR code at the same time this will be stored in the database. The database will keep a record of the missed households.

### **3.2.3 Yard Management**

The yard will be managed by the proper inventory management system. The administrator will enter the record of every scrap item. It will help you to manage and keep track of everything. It tracks inventory from purchase to the sale of goods.

### **3.2.4 View Nearest Yard**

The household user and hawkers would be able to find the nearest yard in order to sell their scrap. It will save their time by allowing them quickly to locate a yard.

### **3.2.5 Leads Management**

The administrator can track, keep records, and assign multiple leads to the administrator. The system will prioritize leads and send email if necessary.

### **3.2.6 Schedule Scrap Pickup**

The household and shopkeepers can schedule a pickup of scrap. They will enter, provide their address or share their location through the mobile app. The collector will collect the scrap.

### **3.2.7 Bonus Points**

The administrator will give points to hawkers and collectors based on their performance. These points will be convertible to cash after some limit of points.

### **3.2.8 Bidding**

On the web, the administrator will start a bidding process. Every registered company can view this and bid on the stock. The stock will be delivered to a company with maximum potential to buy the stock.

### **Other Functional Requirements**

- 3.2.9** The collector will generate QR code to attach on basket.
- 3.2.10** The recycling company will be able to register themselves through the web.
- 3.2.11** The system shall allow user to chat with admin on app.
- 3.2.12** The system shall display all the services offered by the scrap hub.
- 3.2.13** The system will allow users to provide feedback on the performance of the collector.
- 3.2.14** The system shall allow the admin to set the time of bidding.
- 3.2.15** The system will provide the real time analytics of scrap price and items.
- 3.2.16** The system shall allow the user to rate the performance of the collector.

### **3.3 Non-Functional Requirements**

Following are the non-functional requirements.

#### **3.3.1 Performance Requirements**

- The application would support one user against the database on server.
- The application would access the server Database within no time when the user logs in.
- Very less response time is expected.
- The application would compute results effectively and quickly.

#### **3.3.2 Safety Requirements**

This is an android and web application to be used by home users, scrap collectors, shopkeepers, administration, and registered companies only. As this is not a safety-critical system therefore no safety requirements would be required. There is a web application for Administration only. We

will take standardized input from users. We will prevent our database Injection attacks. Therefore, our system always will be in a safe state.

### **3.3.3 Security Requirements**

There will be user authentication and authorization in the android applications as well as the web application [2]. User Authentication, users' profile history, and communication between the admin and all the other users would be secured. Third-party tools like JSON web tokens and AUTH0 will provide security to protect.

### **3.3.4 Software Quality Attributes**

The Software Quality Attributes of the system are listed below.

#### **3.3.4.1 Availability**

The mobile and web applications would be available 24 hours a day, 7 days a week except for the maintenance time of the system.

#### **3.3.4.2 Usability**

The System would be easy-to-use and would be appropriate for the target market of home users, scrap collectors, shopkeepers, administration, and registered companies. The application would include help, within itself, for the user. Users would not require the use of a hardcopy Manual to use the app.

## **3.4 Other Requirements**

Some other requirements of the system are listed below.

### **3.4.1 Application Standards**

The application user-interface would be android phone and website.

### **3.4.2 System Requirements**

- An Android Phone with at least 2 GB RAM
- The phone must have Google play to install the application.

- Desktop and modern browser to access the web.

### **3.4.3 Performance Requirements**

- The android application would support one user against the database on server at any given time.
- The android application would access the server Database within no time.
- The android application would compute results effectively and quickly.

### **3.4.4 Document Requirements**

The User Manual would describe the use of the app and web for home users, scrap collectors, shopkeepers, administration, and registered companies. It will be available within the application [4]. The User Manual should include:

- Minimum System Requirements
- Guidelines Installation of the app
- All System Features

## 4. Use Case Diagram

Based on Figure 1, the labeled use case diagram represents the system's functional requirements and user interactions.

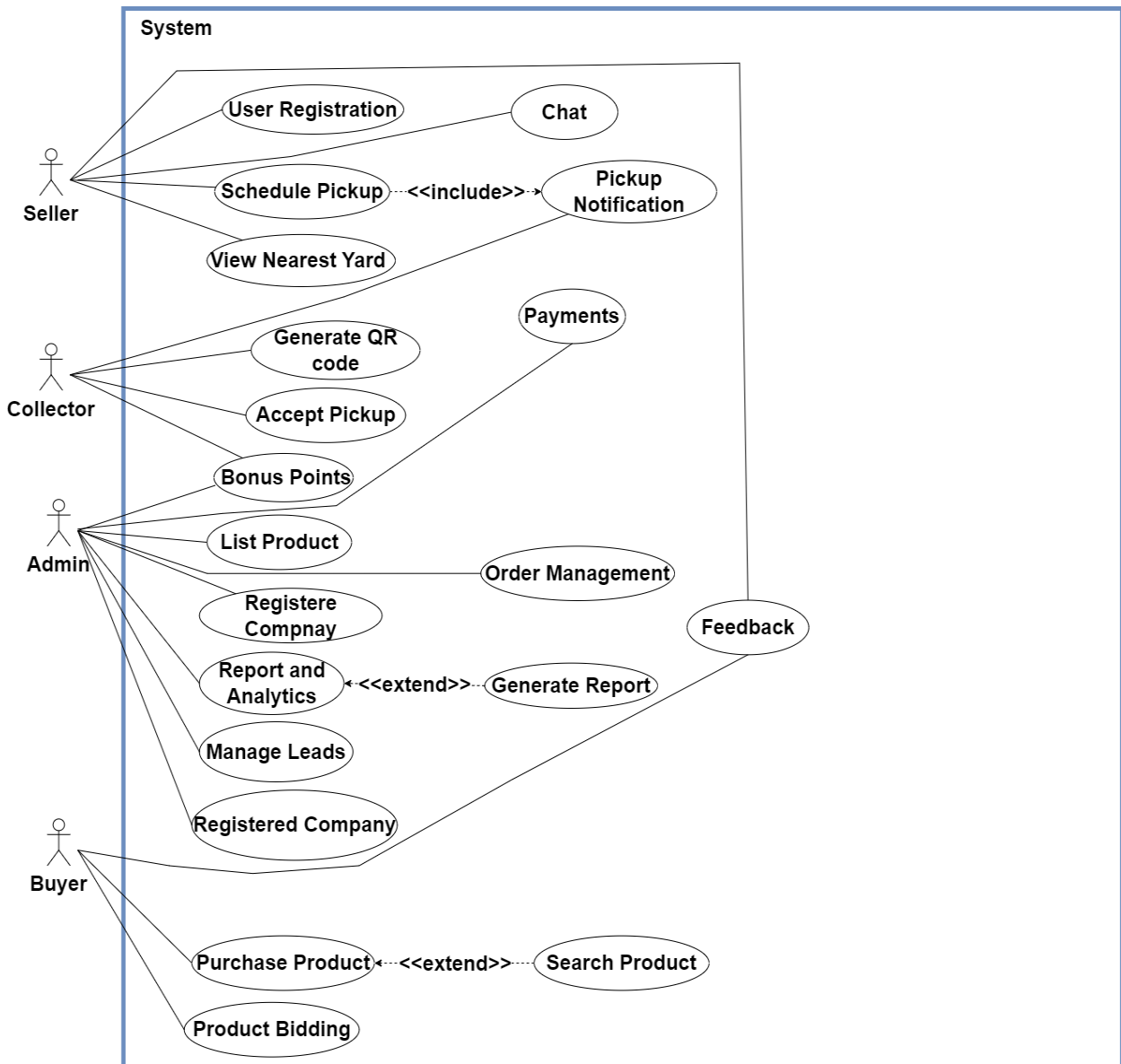


Figure 1: Use Case Diagram

In this diagram you can see we have four main users of our system, seller, collector, Admin, Buyer. Every user has their own role and interaction with the system. This diagram helps the developer of a system to define system modules before developing the system.

## 5. High Level Use Case

High level use cases of our system are given below.

### 5.1 User Registration

The user registration that manages the user profile has one primary actor seller. Sellers register through this app. This is the important use case of our system as given in Table 5.

Table 5: User Registration

ID:	1
Name:	User Registration
Actor:	Seller
Type:	Primary
Description:	Seller will register through the app before use.

### 5.2 Nearest Yard

The nearest yard which helps the seller to view nearest yard for pickup use case of our system is given in Table 6.

Table 6: Nearest Yard

ID:	2
Name:	Nearest Yard
Actor:	Seller
Type:	Primary
Description:	Seller sees the nearest yard form the app.



### 5.3 Feedback

The feedback module which allows the user to provide feedback on your system to the admin use case of our system is given in Table 7.

Table 7:Feedback

ID:	7
Name:	Feedback
Actor:	Seller, Byer
Type:	Primary
Description:	Seller and buyer will be able to feedback through our system

### 5.4 Search Product

This search product use case helps the user to search for products that they want to buy. Search Product use case of our system is given in table 8.

Table 8:Search product

ID:	3
Name:	Search product
Actor:	Buyer
Type:	Primary
Description:	Buyer will Search product through website

## 5.5 Register Company

Admin registered with the company that bids on our scrap stocks. Register company use case of our system is given in table 9.

Table 9: Register Company

ID:	4
Name:	Register Company
Actor:	Admin
Type:	Primary
Description:	Admin will register the Company

## 5.6 View Register and collector

Admin can view the list of collectors. The view register and collector use case of our system is given in table 10.

Table 10: View Register and collector

ID:	5
Name:	View Register and Collector
Actor:	Admin
Type:	Primary
Description:	Admin will view the register user and register collector

## 5.7 Generate Reports

Admin can generate the daily reports of the system. Generate reports use case of our system is given in table 11.

Table 11:Generate Report

ID:	6
Name:	Generate Reports
Actor:	Admin
Type:	Primary
Description:	Admin will be able to generate the daily inventory report.

## 5.8 User Authentication

To verify the seller and collector they will be authenticated during their Signups. The user authentication use case of our system is given in table 12.

Table 12:User Authentication

ID:	8
Name:	User
Actor:	Seller, Collector
Type:	Primary
Description:	User will be authenticated with help of OTP verification.

## 6. Expended Use Case

### 6.1 List Product

This expended use case represents a variation or extension of a primary use case, incorporating additional steps or alternative flows to handle specific scenarios or specialized requirements. List product to list the scrap products on our web page. This extended use case is invoked when an admin lists the products on web page. List Product of our system is given in table 13.

Table 13:List Product

ID	5
Name	List Product
Actor	Admin
Description	Amin will list all the product on the web page that are available in the Stock.
Trigger	Event will be Initiated by the admin
Pre-Condition	Admin must be logged in to the system. Product should be available in the stock
Post-Condition	Product will be visible to buyer with the complete description
Normal Flow	Admin will check the product is available in stock. Admin will list the available product with proper image and description. Admin will categorize the product into two types, for bidding and for simple buy.
Alternative Flow	If product is already listed, then admin will be able to update it.
Exception	None
Includes:	None
Frequency of use	Normal

## 6.2 Purchase Product

This expended use case represents a variation or extension of a primary use case, incorporating additional steps or alternative flows to handle specific scenarios or specialized requirements.

Buyers buy products from our web page. This extended use case is invoked when a buyer buys the products from a web page. Purchase Product of our system is given in table 14.

Table 14:Purchase Product

ID	6
Name	Purchase Product
Actor	Buyer
Description	Buyer will place a order to purchase the scrap
Trigger	Event will be Initiated when a new order is submitted
Pre-Condition	Buyer is logged into the system
Post-Condition	Packing order is sent to the warehouse for preparing the Shipment
Normal Flow	1 Buyer indicates that he/she wants to search for a specific product. 2 Buyer selects the product category and optionally desired product. 3 Buyer selects a specific product and desired Quantity. 4 Byer pay the total price.
Alternative Flow	If any product is not in stock, a backorder is created. On completion, the seller will be sent an order confirmation
Exception	Buyer receives the order which is unavailable.
Includes:	None
Frequency of use	Normal

### 6.3 Leads Management

This expended use case represents a variation or extension of a primary use case, incorporating additional steps or alternative flows to handle specific scenarios or specialized requirements. The Leads Management team manages the leads that are generated into our system. This extended use case is invoked when a leads team manages the leads on web page. The lead management use case of our system is given in table 15.

Table 15:Lead Management

ID	1
Name	Leads Management
Actor	Admin
Description	Admin will manage the leads of user
Trigger	Event will be initiated when lead management operates.
Pre-Condition	Admin should be login to system.
Post-Condition	Created leads should be stored in centralized database.
Normal Flow	<ol style="list-style-type: none"> <li>1 Lead will come from emails, calls, chats.</li> <li>2 leads will be stored in the database.</li> <li>3 Admins will be able to sort and create the reports for their own uses.</li> <li>4 Admin will be able to use the leads data to engage potential customers.</li> <li>5 Admin will be able to generate reports.</li> </ol>
Alternative Flow	None
Exception	Data will not store in database
Includes:	None
Frequency of use	Normal

## 6.4 Make Payment

This expended use case represents a variation or extension of a primary use case, incorporating additional steps or alternative flows to handle specific scenarios or specialized requirements. This use case describes how admin manages payment that will release to seller in exchange for scrap. This extended use case is invoked when an admin manages the schedule pickups payment from the web page. Make payment use case of our system is given in table 16.

Table 16:Make Payment

ID	4
Name	Make Payment
Actor	Admin, seller
Description	Admin will pay the Seller based on generated QR code.
Trigger	Event will be Initiated when a Make Payment
Pre-Condition	Collected Scrap from the Seller will be verified by Scanned QR code.
Post-Condition	Seller receives the Payment Successfully.
Normal Flow	<ol style="list-style-type: none"><li>1. Admin scan QR code for verification.</li><li>2. Payment will release to Seller.</li></ol>
Alternative Flow	Payment will be done manually by collector.
Exception	Collector not able to scan the QR code properly.
Includes:	None
Frequency of use	Normal

## 6.5 Generate QR Code

This expended use case represents a variation or extension of a primary use case, incorporating additional steps or alternative flows to handle specific scenarios or specialized requirements. Generate QR code to verify the pickups that reached in inventory are valid. This extended use case is invoked when a collector generates the QR code from an app and then attaches it to product. Generate QR code use case of our system is given in table 17.

Table 17:Generate QR code

ID	3
Name	Generate QR code
Actor	Collector
Description	Collector will generate the QR code after entering the weight, name and price
Trigger	Event will be Initiated when a QR generated.
Pre-Condition	Collector will receive the scrap pickup notification.
Post-Condition	Collector will attach the generated QR on Scrap.
Normal Flow	<ol style="list-style-type: none"> <li>1 The collector will enter the data.</li> <li>2 The Collectors will generate the QR Code.</li> <li>3 The collector will attach the QR Code to the scrap.</li> <li>4 The Collector will close the Pickup.</li> </ol>
Alternative Flow	None
Exception	Wrong QR is not generate properly.
Includes:	None
Frequency of use	One QR code will be generated.
Special Requirement	



## 6.6 Bonus Point

This expended use case represents a variation or extension of a primary use case, incorporating additional steps or alternative flows to handle specific scenarios or specialized requirements. Bonus points that define the collector's performance during pickups to increase their interest and loyalty, collector can view it on their App. This extended use case is invoked when an admin gives bonus points to collector from their admin panel. The bonus point use case of our system is given in table 18.

Table 18: Bonus Point

ID	9
Name	Bonus point
Actor	Admin, Collector
Description	Admin will provide the Bonus point to the Collector based upon who pick up the most Scrap.
Trigger	Event will be Initiated when a pickup process is completed.
Pre-Condition	Collected Scrap from the Seller will be verified by Scanned QR code.
Post-Condition	Collector will receive the bonus point successfully.
Normal Flow	<ol style="list-style-type: none"> <li>1 The collector will drop the Scrap at the warehouse location.</li> <li>2 After verification bonus point will be release to collector by admin.</li> </ol>
Alternative Flow	None
Exception	None
Frequency of use	Normal

## 6.7 Schedule Pickup

This expended use case represents a variation or extension of a primary use case, incorporating additional steps or alternative flows to handle specific scenarios or specialized requirements. Collector gets the pickup notification; this extended use case is invoked when an seller schedules the pickup from app. Schedule pickup use case of our system is given in table 19.

Table 19:Schedule Pickup

ID	2
Name	Schedule pickup
Actor	Seller, Collector
Description	Seller will Schedule to collect the Scrap.
Trigger	Event will be Initiated when a Schedule Pickup.
Pre-Condition	Seller must Enter the time, date, and Address
Post-Condition	Notification will be sent to the collector.
Normal Flow	<ol style="list-style-type: none"> <li>1. The seller will enter the time, date, and address to schedule the collection of Scrap.</li> <li>2. Notification will be sent to the collector.</li> <li>3. The Collector will accept the notification.</li> </ol>
Alternative Flow	If the Collector did not receive notification or not respond received notification, then admin will notify to available collector to collect the scrap.
Exception	App will downfall due to most of the notifications is accumulated
Includes:	None
Frequency of use	Normal
Special Requirement	

## 6.8 Biding

This expended use case represents a variation or extension of a primary use case, incorporating additional steps or alternative flows to handle specific scenarios or specialized requirements. Product bidding use case shows how buyers can bid on products. This extended use case is invoked when buyer bids the product from web page. The binding use case of our system is given in table 20.

Table 20:Biding

ID	8
Name	Product Biding
Actor	Buyer
Description	Buyer will bid for Scrap
Trigger	Event will be Initiated when a bidding
Pre-Condition	Buyer will check the Product from list.
Post-Condition	Product should be available for bidding
Normal Flow	<ol style="list-style-type: none"> <li>1 Buyer searches the product.</li> <li>2 Buyer performs the bid according to their needs.</li> <li>3 Admin will Show detail about bidding of every product.</li> <li>4 After the completion of given time bid product will be ordered to buyer.</li> </ol>
Alternative Flow	<ol style="list-style-type: none"> <li>1 Listed bid product will be mail manually to potential users.</li> <li>2 If no one bids on the product, then the bid will be close.</li> </ol>
Exception	System will order to wrong bidder.
Includes:	None
Frequency of use	Normal
Special Requirement	

## 6.9 Order Management

This expended use case represents a variation or extension of a primary use case, incorporating additional steps or alternative flows to handle specific scenarios or specialized requirements. Admin manages the products inventory from their web panel. This extended use case is invoked when buyer buys the products from web page. The order management use case of our system is given in table 21.

Table 21:Order Management

ID	7
Name	Order Management
Actor	Admin, Buyer
Description	Admin will manage the order request of the scrap product
Trigger	Event will be Initiated when a buyer, orders the scrap product.
Pre-Condition	Admin will check the product is available in the stock.
Post-Condition	Admin proceed the order for shipment.
Normal Flow	<ol style="list-style-type: none"> <li>1 Admin receives the order request from buyer.</li> <li>2 Admin will check the stock.</li> <li>3 Admin will send the product for shipment.</li> <li>4 Admin will maintain the record.</li> </ol>
Alternative Flow	If the product is out of stock, then admin will notify the buyer.
Exception	Admin did not receive the order notification.
Includes:	None
Frequency of use	Normal

## 7. Domain Model

Domain models describe the domain of a system. This model describes the real-world entities of our system. The domain model diagram provides a clear representation of the core entities and relationships in our ScrapHub system. It serves as a foundation for understanding the system's structure and aids in the development of the corresponding software architecture. The domain model of our system is shown in Figure 2.

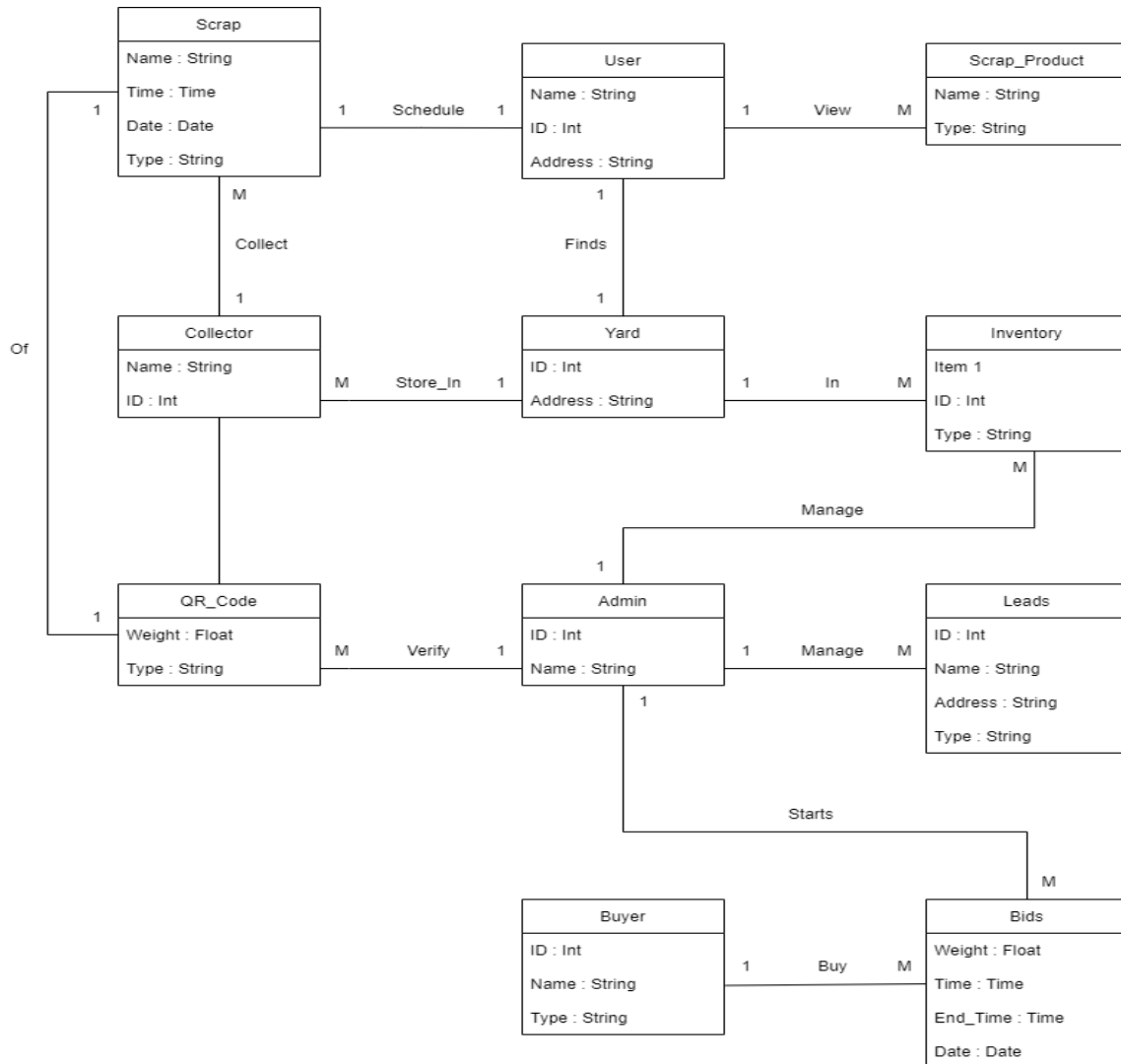


Figure 2: Domain Model

## 8. Component Diagram

A component diagram is a visual representation and their interactions within our ScrapHub system. That illustrates the high-level structure and organization of software components within a system, and it helps in understanding the system's architecture. At the top level, we have the "Admin" component, which represents the admin roles through which others different components interact with the system. It communicates with other components to receive user input and display relevant information. Component diagram of our system is shown in Figure 3.

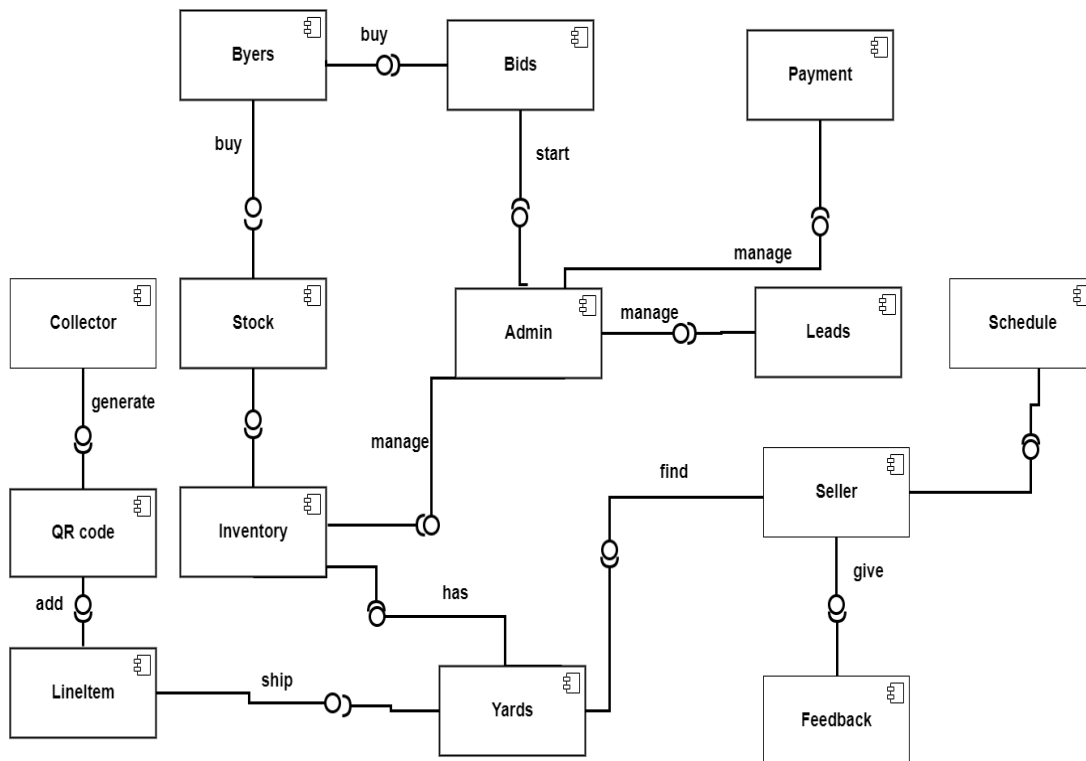


Figure 3:Component Diagram

## 9. Activity Diagram

This activity diagram provides a clear visualization of the sequential flow of activities and decision points involved in our ScrapHub system. It helps in understanding the order fulfillment process and stakeholders' activities payment processing, schedule pickups, scrap collections and

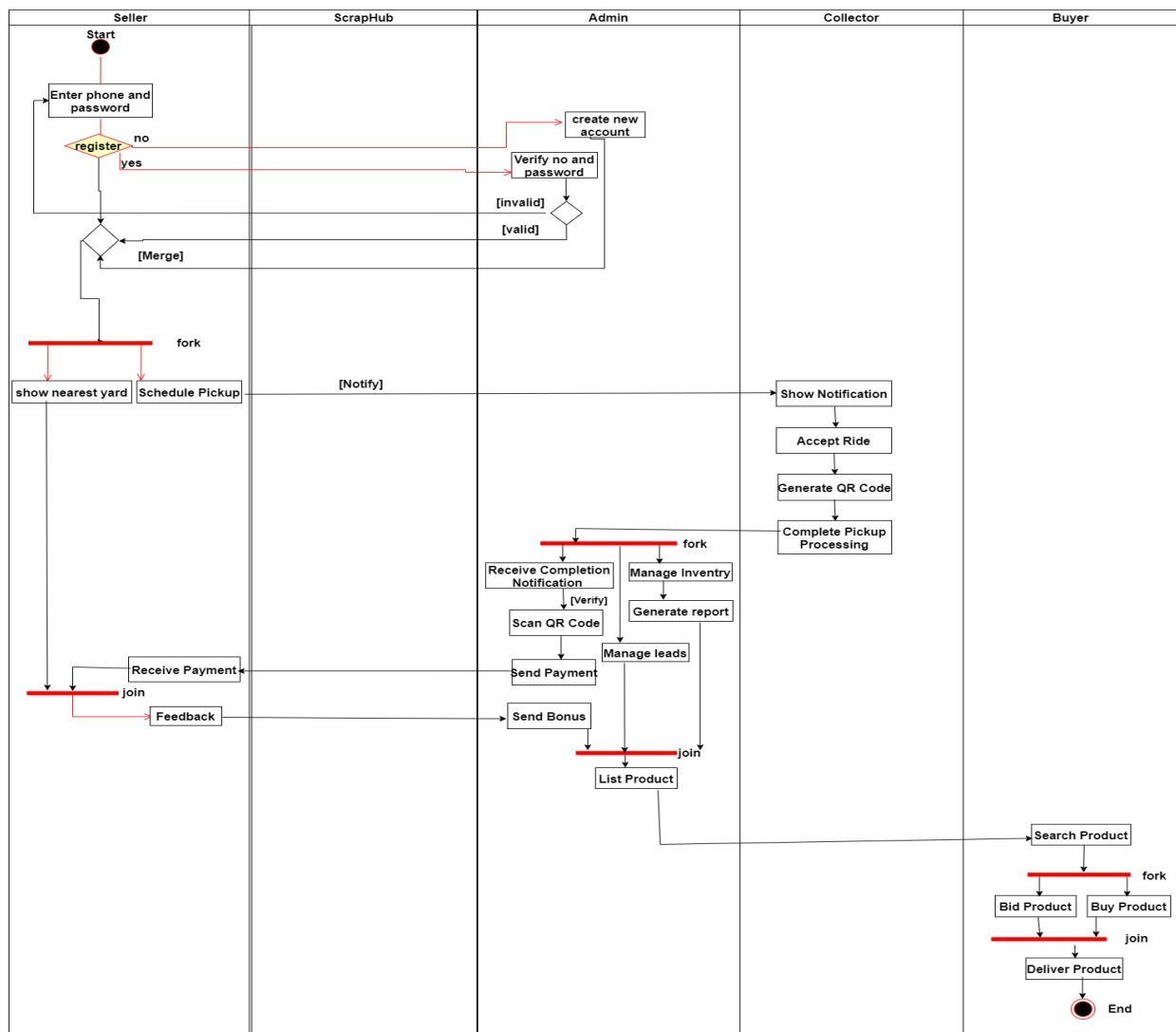


Figure 4:Activity Diagram

inventory control, identifying potential bottlenecks or issues, and facilitating system improvements. Activity diagram of our system is shown in Figure 4.

## 10. Architecture Diagram

Architecture diagram describes the major interaction between the components of the system. This architecture diagram provides a high-level overview of the ScrapHub system's structure, emphasizing the major components and their interactions. It helps in understanding the system's design, facilitating discussions among stakeholders, and guiding the development and maintenance of the web application.

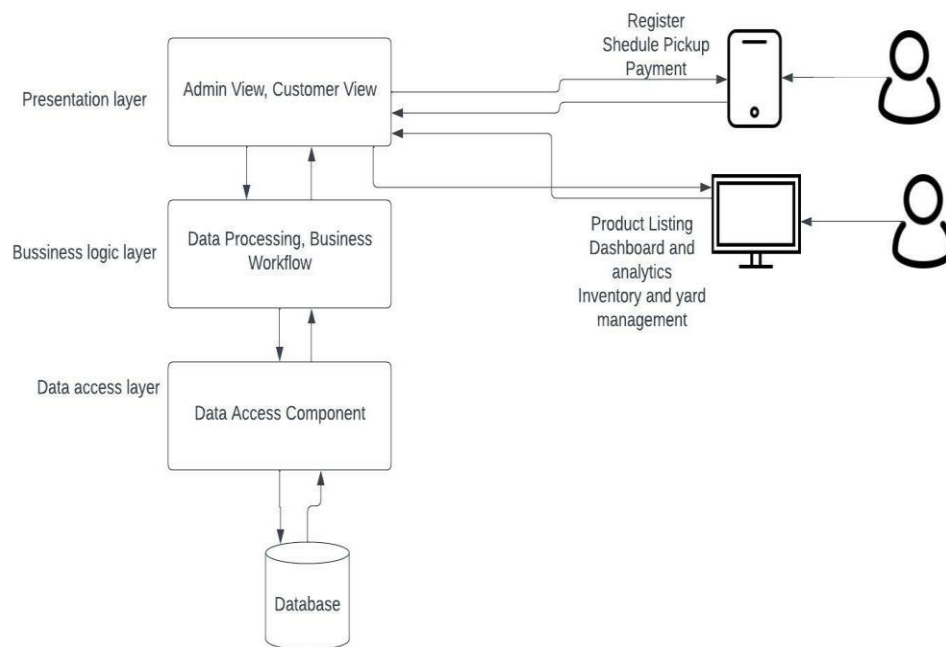


Figure 5:Architecture Diagram

It shows we are using the three-layer architecture. Architecture diagram of our system is shown in Figure 5.



## 11. Data Flow Diagram

A data flow diagram (DFD) is a visual representation that illustrates the flow of data within a system or process. Our ScrapHub Yard management system demonstrates the flow of data and

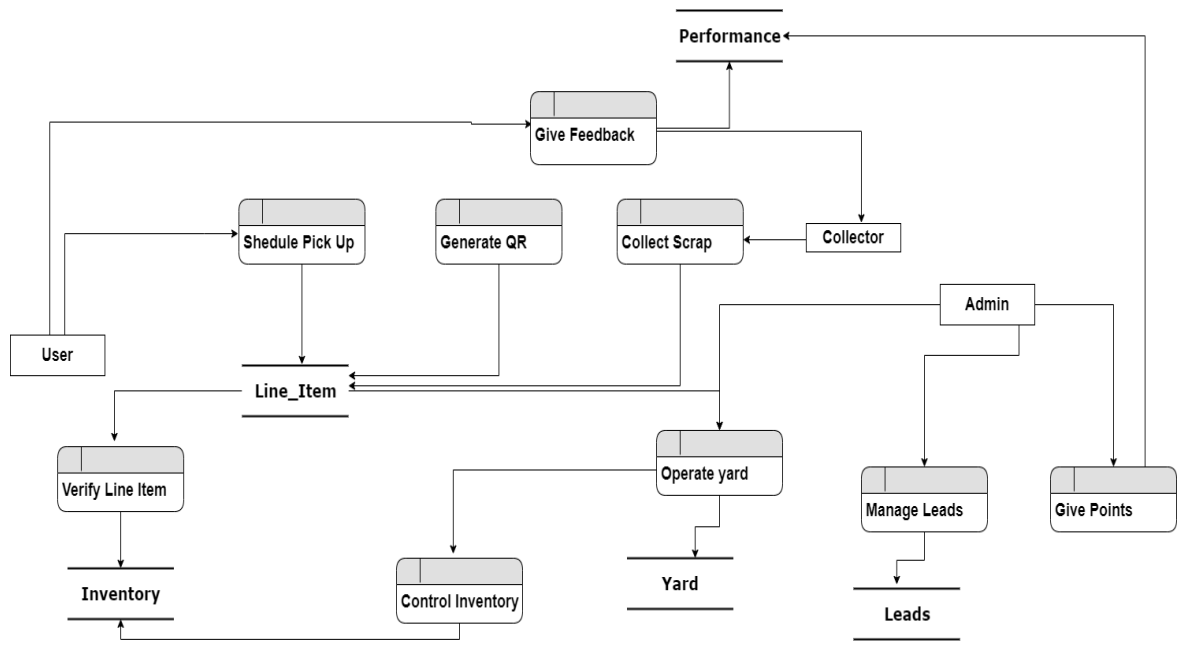


Figure 6:Data flow diagram

processes involved in managing inventory. At the center of the diagram, we have the "Yard Operation" process, which represents the main component responsible for managing the inventory. The data flow diagram of our system is shown in Figure 6.

## 12. System Sequence Diagram

A system sequence diagram is a visual representation that depicts the interactions between an external actor and a system. The SSD of our system is shown in the Figures below.

### 12.1 List Product

This system sequence diagram captures the chronological order of events and the message exchanges between the admin and the system during a specific use case. It helps in understanding the flow of control, the responsibilities of the actor and the system, and the overall behavior of the system.

to user  
product  
diagram  
Figure 7.

of the  
in response  
actions. List  
SSD  
is given in

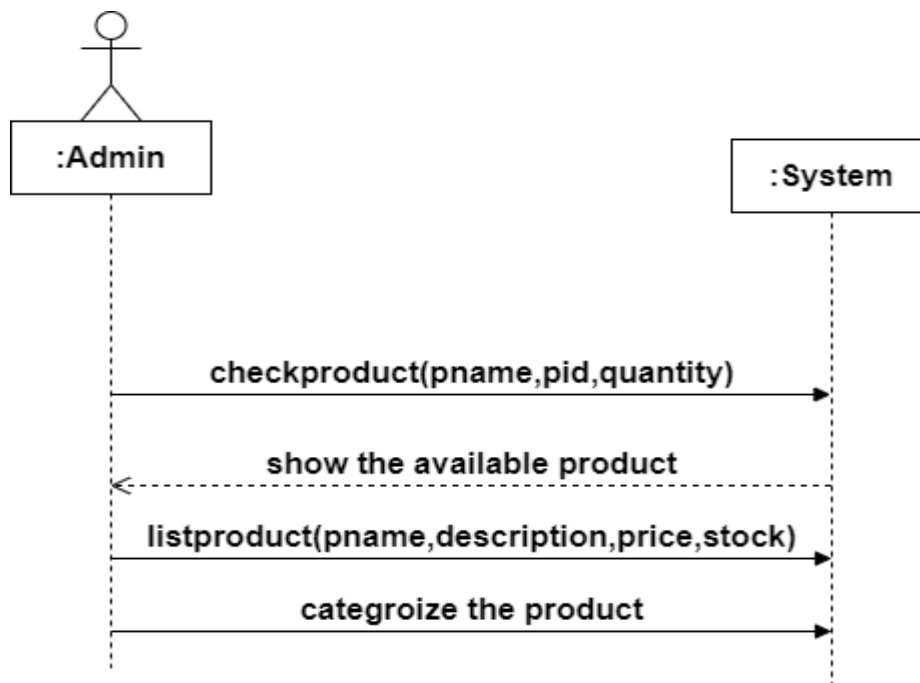


Figure 7:List product SSD

## 12.2 Purchase Product

This system sequence diagram captures the chronological order of events and the message exchanges between the Buyer and the system during a specific use case. It helps in understanding the flow of control, the responsibilities of the actor and the system, and the overall behavior of the system in response to user actions. Purchase product SSD diagram is given in Figure 8.

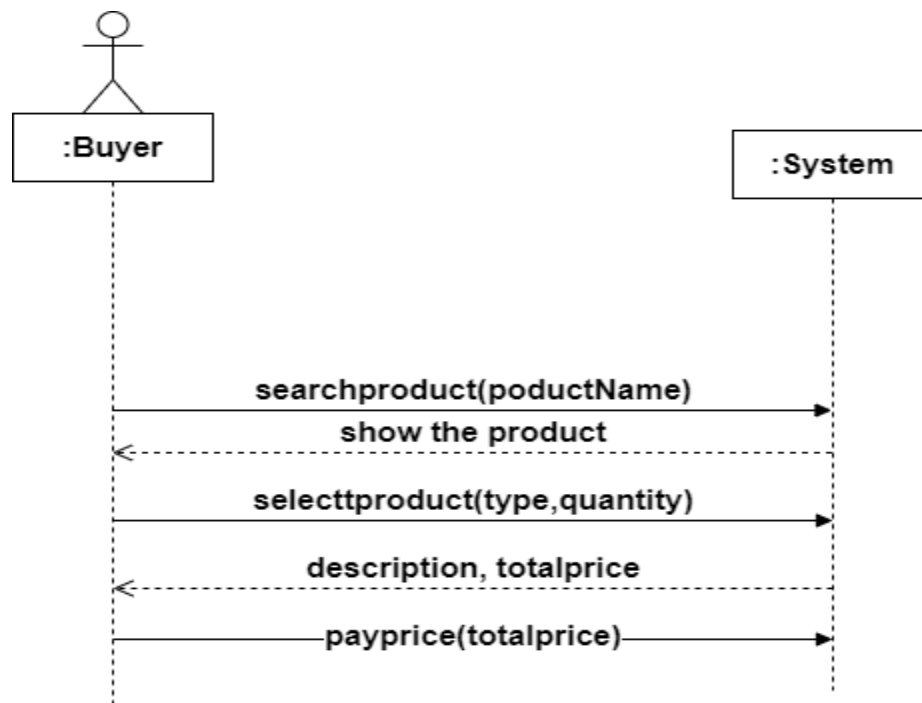


Figure 8:Purchase Product

## 12.3 Manage Leads

This system sequence diagram captures the chronological order of events and the message exchanges between the admin and the system during a specific use case. It helps in understanding the flow of control, the responsibilities of the actor and the system, and the overall behavior of the system in response to user actions. Manage leads SSD diagram is given in Figure 9.

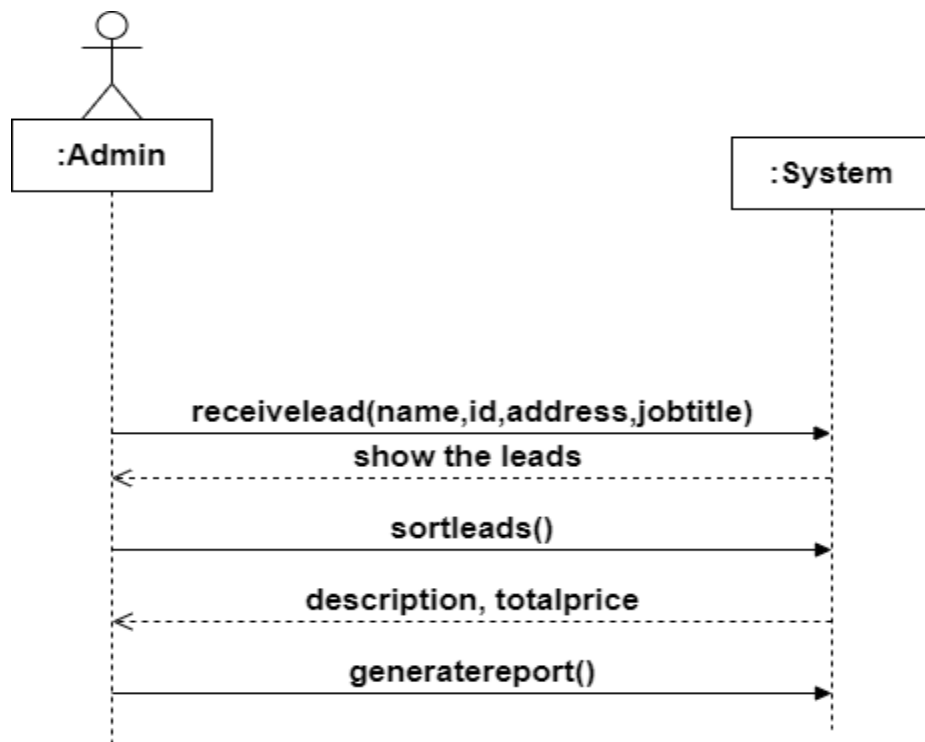


Figure 9:Manage Leads

## 12.4 Make Payment

This system sequence diagram captures the chronological order of events and the message exchanges between the admin and the system during a specific use case. It helps in understanding the flow of control, the responsibilities of the actor and the system, and the overall behavior of the system in response to user actions. Make payment SSD diagram is given in Figure 10.

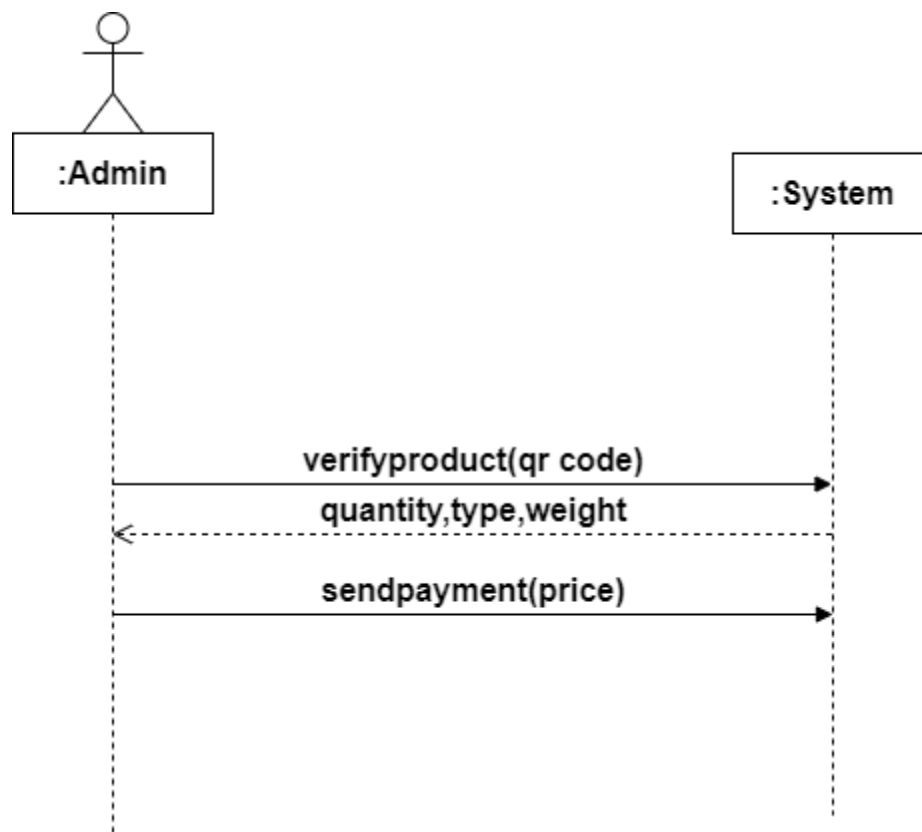


Figure 10:Make Payment

## 12.5 Generate QR Code

This system sequence diagram captures the chronological order of events and the message exchanges between the collector and the system during a specific use case. It helps in understanding the flow of control, the responsibilities of the actor and the system, and the overall behavior of the system in response to user actions. Generate QR code SSD diagram is given in Figure 11.

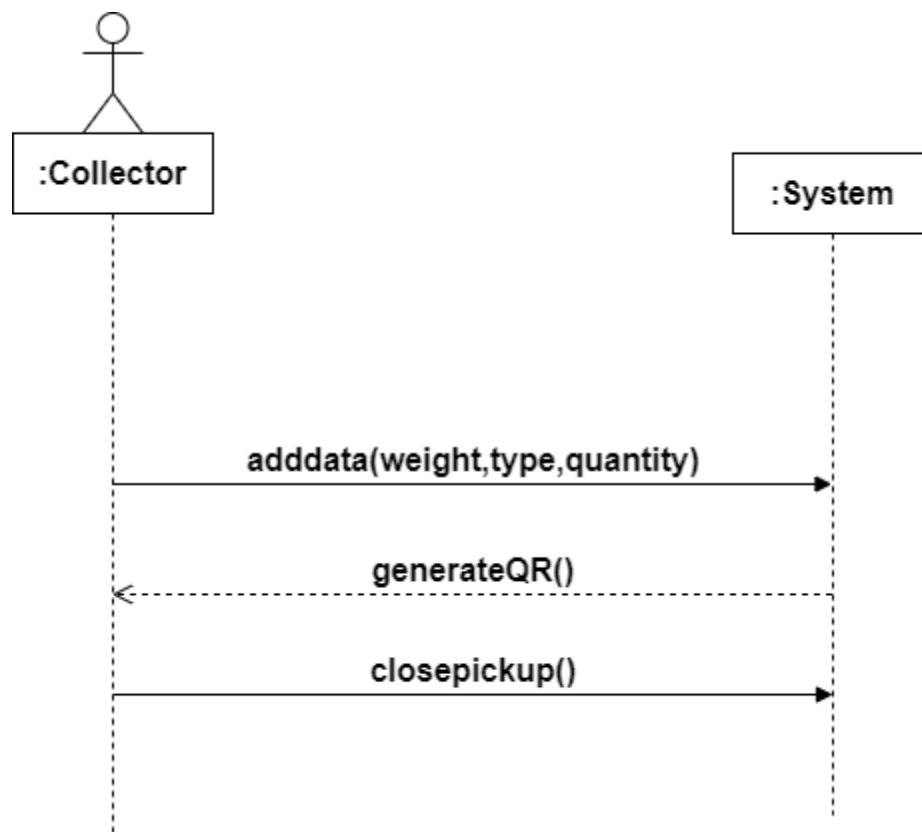


Figure 11:Generate QR SSD

## 12.6 Schedule Pickup

This system sequence diagram captures the chronological order of events and the message exchanges between the seller and the system during a specific use case. It helps in understanding the flow of control, the responsibilities of the actor and the system, and the overall behavior of the system in response to user actions. Schedule pickup SSD diagram is given in Figure 12.

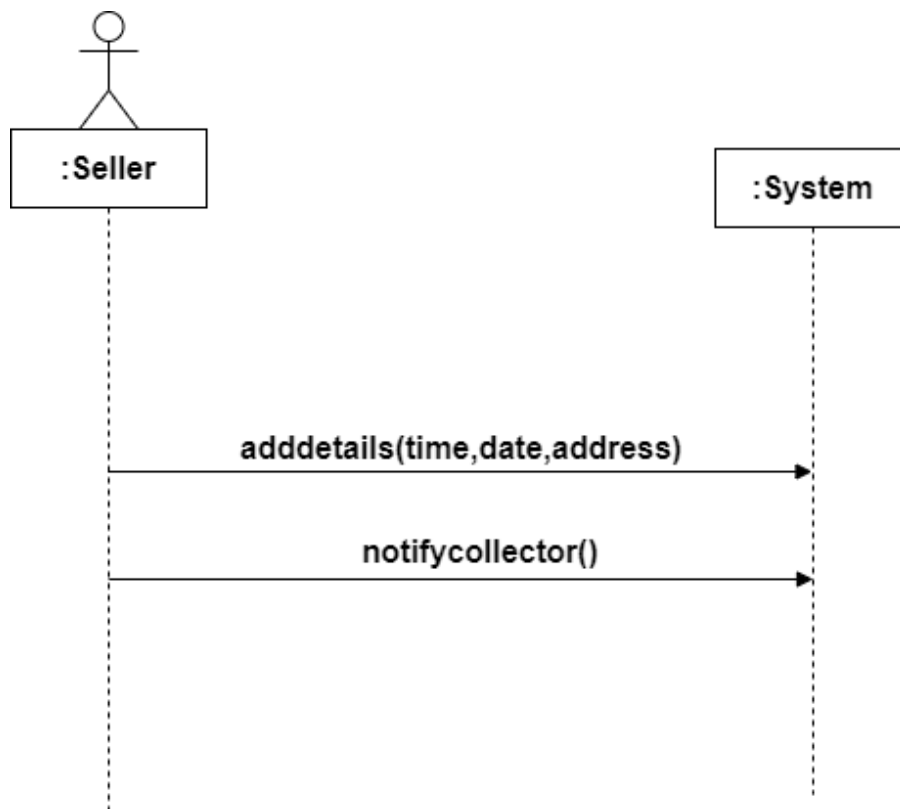


Figure 12:Schedule pickup SSD

## 12.7 Order Management

This system sequence diagram captures the chronological order of events and the message exchanges between the admin and the system during a specific use case. It helps in understanding the flow of control, the responsibilities of the actor and the system, and the overall behavior of the system in response to user actions. Order management SSD diagram is given in Figure 13.

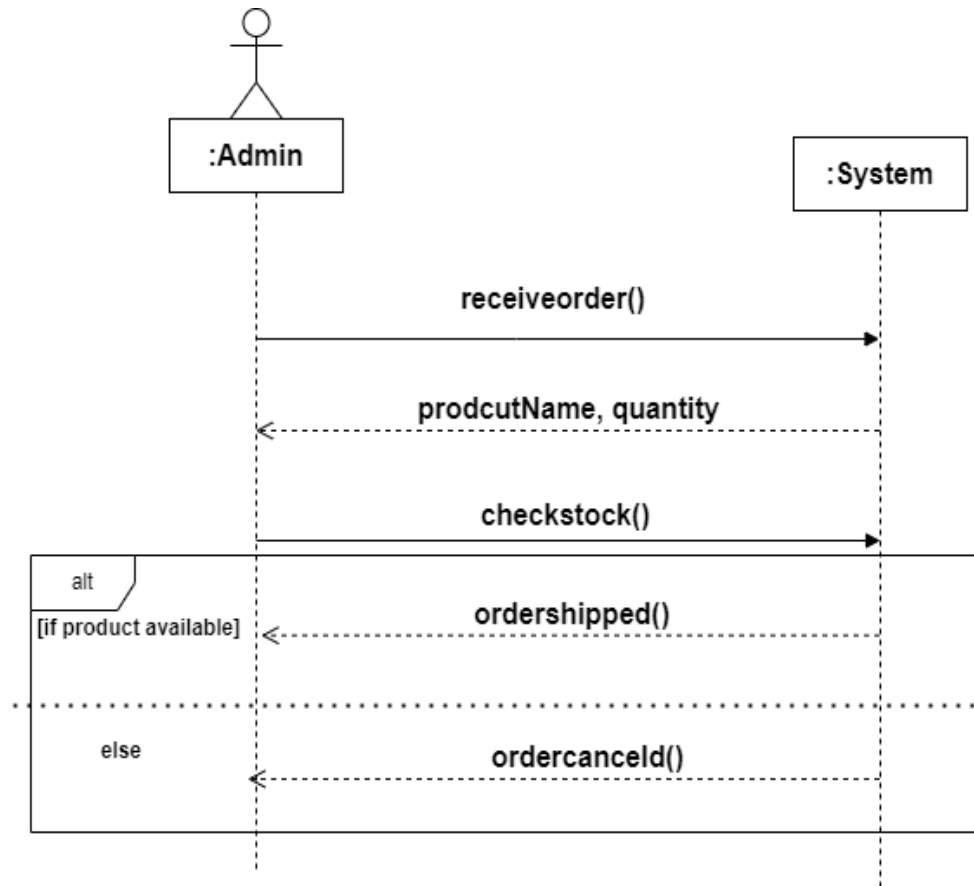


Figure 13:Order Management



### 13. Schema Diagram

A schema diagram is a visual representation that illustrates the structure and relationships between database tables, including their attributes and constraints. It helps in understanding the database design, guiding database administrators and developers in creating the necessary attributes, and relationships to support the system's functionality. The schema of our system is shown in Figure 14.

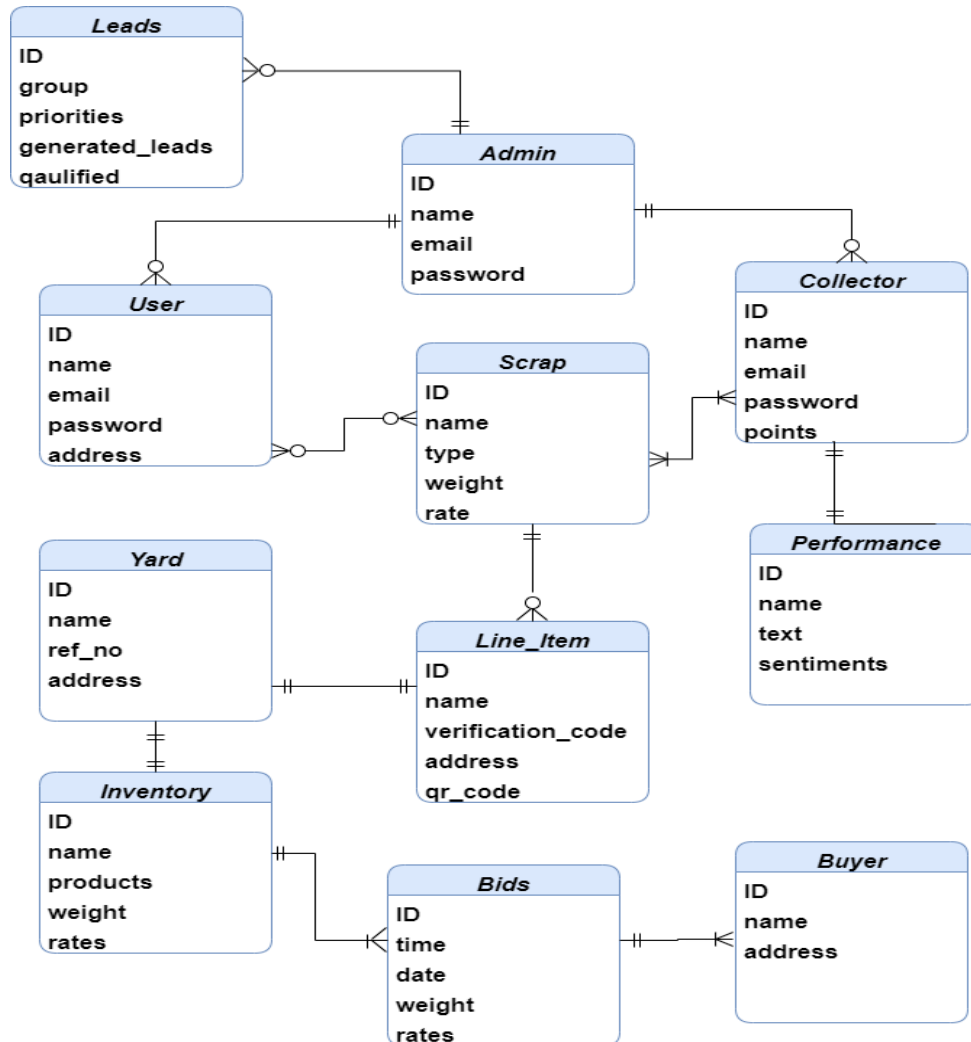


Figure 14:system schema

## 14. Sequence Diagram

A sequence diagram is a visual representation showing the interactions between objects or actors in a system, illustrating the flow of messages and their order of occurrence [5]. It helps analyze behavior, identify dependencies, and communicate system dynamics efficiently. The diagram consists of several elements, including objects, lifelines, messages, and activation bars. Objects, represented as rectangles with the object's name.

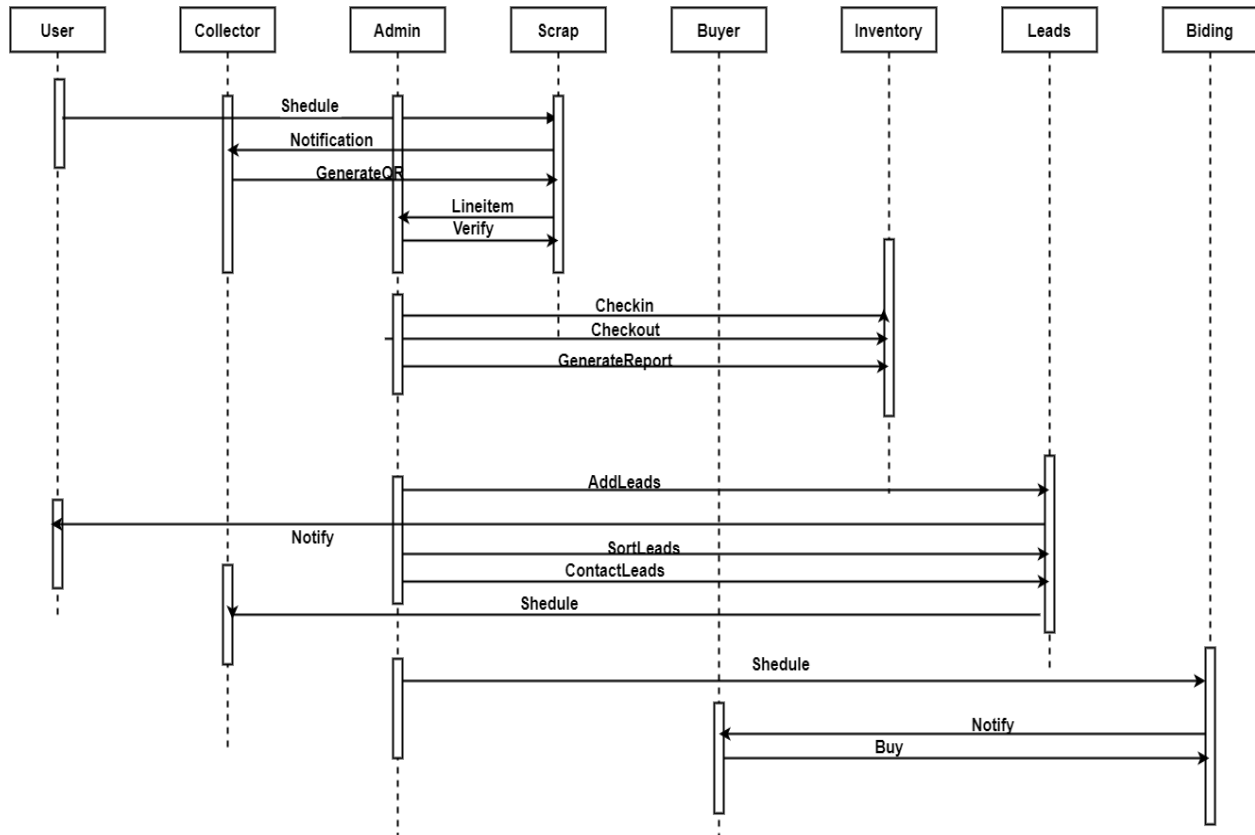


Figure 15:Sequence diagram

Activation bars, represented by vertical dashed lines extending across the lifelines, indicate the duration of an object's processing or execution. The sequence diagram of our system is shown in Figure 15.

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