

**ONLINE-BASED SCRAP MANAGEMENT SYSTEM SERVICE
(SCRAPWALA)**

BY

MD AZHAR UDDIN IMRAN

ID: 201-15-3559

FINAL YEAR DESIGN PROJECT REPORT

This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

SHAHADAT HOSSAIN

Lecturer (Senior Scale)

Department of Computer Science and Engineering
Daffodil International University

Co-Supervised By

MD ASSADUZZAMAN

Lecturer (Sr. Scale)

Department of Computer Science and Engineering
Daffodil International University



DAFFODIL INTERNATIONAL UNIVERSITY

DHAKA, BANGLADESH

JULY 2024

APPROVAL

This Project titled “Online-Based Scrap Management System Service (Scrapwala)”, submitted by Md Azhar Uddin Imran, ID: 201-15-3559 to the Department of Computer Science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 13 July 2024.

BOARD OF EXAMINERS

Dr. Md. Fokhray Hossain (MFH)
Professor
Department of CSE
Faculty of Science & Information Technology
Daffodil International University

Board Chairman


Shah Md. Tanvir Siddiquee (SMTS)
Assistant Professor
Department of CSE
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner 1


Md Umaid Hasan (MUH)
Lecturer
Department of CSE
Faculty of Science & Information Technology
Daffodil International University

Internal Examiner 2


Dr. Shamim H Ripon (DSR)
Professor
Department of Computer Science & Engineering
East West University

External Examiner

DECLARATION

We hereby declare that this project has been done by us under the supervision of **Shahadat Hossain, Lecturer (Senior Scale), Department of Computer Science and Engineering, Daffodil International University**. We also declare that neither this project nor any part of this project has been submitted elsewhere for the award of any degree or diploma.

Supervised by:


10.07.24

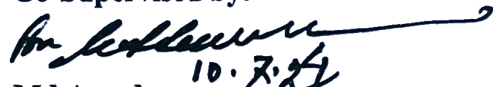
Shahadat Hossain

Lecturer (Senior Scale)

Department of CSE

Daffodil International University

Co-Supervised by:


10.7.24

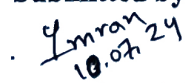
Md Assaduzzaman

Lecturer (Senior Scale)

Department of CSE

Daffodil International University

Submitted by:


10.07.24

Md Azhar Uddin Imran

ID: - 201-15-3559

Department of CSE

Daffodil International University

ACKNOWLEDGEMENT

First, we express our heartiest thanks and gratefulness to almighty for His divine blessing making it possible for us to complete the final year project/internship successfully.

We are grateful and wish our profound indebtedness to **Shahadat Hossain, Lecturer (Senior Scale)**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of our supervisor in the field of “*Web Development*” to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts, and correcting them at all stages have made it possible to complete this project.

We would like to express our heartiest gratitude to **Dr. Sheak Rashed Haider Noori, Professor and Head, Department of CSE**, for his kind help in finishing our project and to other faculty members and the staff of the Department of CSE, Daffodil International University.

We would like to thank our entire course mate in Daffodil International University, who took part in this discussion while completing the course work.

Finally, we must acknowledge with due respect the constant support and patience of our parents.

ABSTRACT

The Online-Based Scrap Management System Service, or Scrapwala, is a web-based platform designed to facilitate the buying, recycling, and selling various types of scrap. The system provides a convenient and efficient way for customers to sell their scrap by requesting pickups through the website. Once a customer selects the desired scrap category and confirms the pickup request, a designated agent is assigned to collect the scrap. Upon collection, the agent verifies the scrap, and the customer receives the corresponding value. Scrapwala offers a user-friendly front-end interface with features like scrap category browsing, customer account management, and order tracking. Customers can easily navigate the website, select their desired scrap category, and manage their accounts and orders. The backend comprises an admin panel that efficiently contains customer information, order details, scrap inventory, and Buyer info. The technology stack employed in Scrapwala includes React for front-end development, providing a responsive and interactive user interface. The backend is powered by Node.js and Express.js, enabling seamless communication between the front end and the database. The data is stored in MongoDB, a NoSQL document database, ensuring flexibility and scalability for managing customer information and transaction records. Scrapwala aims to streamline the scrap management process by providing a centralized platform that connects customers, agents, and recycling vendors. By digitizing the scrap management workflow, the system enhances efficiency, transparency, and convenience for all stakeholders. The successful implementation of Scrapwala will contribute to sustainable waste management practices by promoting the recycling and reuse of scrap materials. It will also provide an accessible and user-friendly platform for individuals and businesses to participate in the scrap market, contributing to a cleaner environment and supporting the circular economy.

TABLE OF CONTENTS

CONTENTS	Page No
Board of Examiners	i
Declaration	ii
Acknowledgement	iii
Abstract	iv
CHAPTER 1: INTRODUCTION	1-7
1.1 Overview	1-2
1.2 Background and Present State	2-3
1.3 Problem Statement	3-4
1.4 Objectives	4-5
1.5 Scope and Limitations	5-6
1.6 Report Organization	6
1.7 Summary	7
CHAPTER 2: LITERATURE REVIEW	8-11
2.1 Overview	8
2.2 Related Works	8-9
2.3 Comparison between existing works	9-10
2.4 Open Issues	10-11
2.5 Summary	11
CHAPTER 3: REQUIREMENT ANALYSIS & DESIGN SPECIFICATION	12-20
3.1 Overview	12
3.2 System Design	12-16
3.3 Hardware/ Software Requirement	16-17
3.4 Project Management and Financial Analysis	17-20

3.5 Summary	20
CHAPTER 4:IMPLEMENTATION	21-27
4.1 Overview	21
4.2 Prototype Design	21-26
4.3 System Testing	26-27
4.4 Summary	27
CHAPTER 5: RESULT AND ANALYSIS	28-29
5.1 Overview	28
5.2 Experimental	28
5.3 Performance	29
5.4 Summary	29
CHAPTER 6: IMPACT ON SOCIETY, ENVIRONMENT AND SUSTAINABILITY	30-31
6.1 Impact on Life	30
6.2 Impact on Society & Environment	30-31
6.3 Ethical Aspects	31
6.4 Sustainability Plan	31
6.5 Summary	31
CHAPTER 7: CONCLUSION AND FUTURE WORK	32-33
7.1 Conclusions	32
7.2 Further Suggested Works	32-33
7.3 Limitations/ Conflict of Interests	33
REFERENCES	34
APPENDIX	35-41
PLAGARISM REPORT	42

LIST OF FIGURES

FIGURES	PAGE NO
Fig 3.2.1: Scrapwala Use case Diagram	12
Fig 3.2.2: Scrapwala Flowchart	13
Fig 3.2.3: Scrapwala Sequence Diagram For admin	14
Fig 3.2.4: Scrapwala Sequence Diagram For user	15
Fig 3.2.5: Scrapwala Entity Relationship	16
Fig 3.4.1: Scrapwala Swot Analysis	19
Figure 4.2.1: Landing Page Design	21
Figure 4.2.2: Home page	22
Figure 4.2.3: User account	23
Figure 4.2.4: Product page	23
Figure 4.2.6: Admin Dashboard	24
Figure 4.2.7: Scrap management	25
Figure 4.2.8: Scrap Sell page	25
Figure 4.2.9: Buyer info	26

LIST OF TABLES

TABLES	PAGE NO
Tab 2.3.1: Comparative analysis with previous work	9-10
Table 3.4.2: Estimated Cost for Web Development Project	20

CHAPTER 1

Introduction

1.1 Overview

Scrap is one hidden treasure if we use it properly. When it comes to scrap in houses, industry, and commercials, it is more than a treasure because if we use this scrap properly, we can also help the environment. When it comes to big cities like Dhaka, where scrap is everywhere in houses, industries, and commercial spaces, the bad thing is there needs to be a proper scrap service or solution for it. Scrapwala is vital in promoting sustainable waste management practices and resource conservation. There is also a traditional way to collect scraps. However, the conventional processes of buying, recycling, and selling scrap materials often involve inefficiencies and a need for more transparency. However, the traditional processes of buying, recycling, and selling scrap materials often involve inefficiencies and a need for more transparency. So, for this challenge, we present Scrapwala, an innovative online-based scrap management system service. Scrapwala aims to provide a managed centralized platform connecting customers, agents, and recycling vendors. The Scrapwala platform will offer a friendly and smooth marketplace for those customers who need to sell their scrap. Customers need to confirm their pickup request through the scrapwala website. A dedicated agent is dispatched to collect the scrap from the customers' location by selecting their desired scrap category and confirming pickup requests. So, this project, scrap wall, is an innovative solution for streamlining the buying, recycling, and selling of scrap materials. The Scrapwala platform has revolutionized the scrap industry, making it easier for customers to sell their scrap, agents to collect and verify the materials, and recycling vendors to process and reuse the resources efficiently.

Cities in Bangladesh are growing daily, and scrap is also increasing daily. So, Scrapwala is an innovative idea that will manage this sector, and consumers will get their desired rate for their scrap. This has a lot of potential for growing a scrap market like this. Scrapwala provides individuals, businesses, and organizations with a convenient way to dispose of their recyclable waste and contribute to environmental sustainability.

The primary goal of Scrapwala is to promote responsible waste management by facilitating the proper handling and recycling of various types of scrap materials. These can be metals, plastics, paper, electronic waste, and other recyclable items. Scrapwala offers pickup or collection services, collecting recyclable materials from the customer's location. It also partners or ties up with recycling facilities or scrap dealers to ensure the collected materials are processed or recycled appropriately.

1.2 Background and Present State

The inability to address the problems associated with urban trash management gave rise to Scrapwala, especially in cities like Dhaka, where scrap materials are collected without adequate disposal. This web-based marketplace has quickly become a leader in the sector by making it easier to buy, recycle, and sell different kinds of scrap materials. Currently, Scrapwala functions via an easy-to-use website that lets clients quickly order pickups, guaranteeing that scrap is picked up by devoted agents right from their places. To maintain operational integrity and customer trust, Scrapwala integrates strong security measures to safeguard transactions and data privacy. A comprehensive understanding of customer behavior further enhances service delivery, ensuring tailored solutions that effectively meet diverse scrap management needs. By limiting environmental effects and lowering landfill waste, the platform promotes sustainable activities and provides fair pay for scrap. With an eye on the future, Scrapwala wants to deepen its involvement in environmental stewardship and sustainable waste management by reaching out to new areas, advocating for favorable regulatory frameworks, improving technological integration, and extending its reach. Moreover, Scrapwala is exploring innovative technological solutions, such as IoT integration and advanced analytics, to enhance its operational capabilities. These advancements not only improve service delivery but also enable real-time tracking of scrap materials and optimize logistical processes for greater efficiency.

As Scrapwala expands its presence and influence, it continues to advocate for policies that support sustainable development and circular economy principles. By influencing

regulatory frameworks and promoting best practices in waste management, Scrapwala seeks to create a lasting impact on urban sustainability and environmental health.

1.3 Problem Statement

Many problems in the scrap management sector prevent effective and transparent methods for purchasing, processing, and selling unwanted materials. These obstacles consist of:

- **Lack of Centralized platform:** A specific platform is needed for customers to connect with agents and recycle vendors. It leads to inefficient delays and insufficient insight into the scrap management process.
- **Manual and time-consuming processes:** The traditional way of scrap management solutions depends significantly on manual processes, which rely on physical documents and phone calls. This process takes too much time, and the error-prone nature of these processes can hamper scalability.
- **Limited transparency and accountability:** Often, customers need help tracking the progress of their scrap orders and verifying the value they receive for their materials. Her lack of accountability and transparency causes renovation in the industry.
- **Inefficient scrap categorization and inventory management:** With a proper standardized system for scrap categorization and inventory management, it is easier for agents and recycling vendors to process and reuse scrap materials efficiently.
- **Limited accessibility for customers:** If we look at physical scrap shops, they are in specific areas with limited access to customers because customers may reside in distant places, which leads to inconvenience, and further money and transportation are needed.
- **Environmental Impact:** Traditional scrap management practices often lead to improper disposal, contributing to environmental pollution.

After seeing this challenge, it needs an online-based scrap management system that centralizes the process, introduces automation, enhances transparency, and improves customer accessibility. By providing a user-friendly platform that streamlines the buying,

recycling, and selling of scrap materials, Scrapwala seeks to address these concerns in a transparent, sustainable, and efficient manner.

1.4 Objectives

The main goals of this Project are:

- ❖ Design a user-friendly, intuitive, responsive platform; both will be included. It also enables effortless navigation, streamlined transactions, and streamlined administration of customer accounts and orders. It should be possible for users of all technical disciplines to access the platform.
- ❖ Establishing centralization of the waste management process, communication, pickup, and delivery procedures will decrease time and increase efficacy in scrap management. Implement stringent security measures to safeguard user data, ensuring system integrity and protecting against cyber threats.
- ❖ Scalability is essential; to do this again, we need to automate the manual in scrap management. Implementing this automation will enhance the system's scalability and manage to refuse transactions more effectively.
- ❖ To promote recycling and repurposing discarded materials to reduce refuse production and ecological damage. Consequently, the principal objective of Scrapwala is to advance sustainable refuse management through the seamless integration of recycling vendors and businesses.
- ❖ Scrapwala strives to ensure transparency throughout the refuse management process. This includes disseminating current information concerning customer orders, implementing systems to authenticate rejected items, and guaranteeing a fair assessment of waste worth.
- ❖ Design the platform to be scalable, allowing for easy expansion and adaptability to future technological advancements and industry changes.
- ❖ Focus on enhancing customer satisfaction by delivering a seamless and personalized requesting scrap experience, catering to individual preferences and needs.

The principal objective is to promote the adoption of recycling and repurposing approaches for discarded materials to reduce waste production and ecological damage. Scrapwala's main aim is to advance sustainable refuse management by seamlessly integrating recycling vendors, businesses, and individuals.

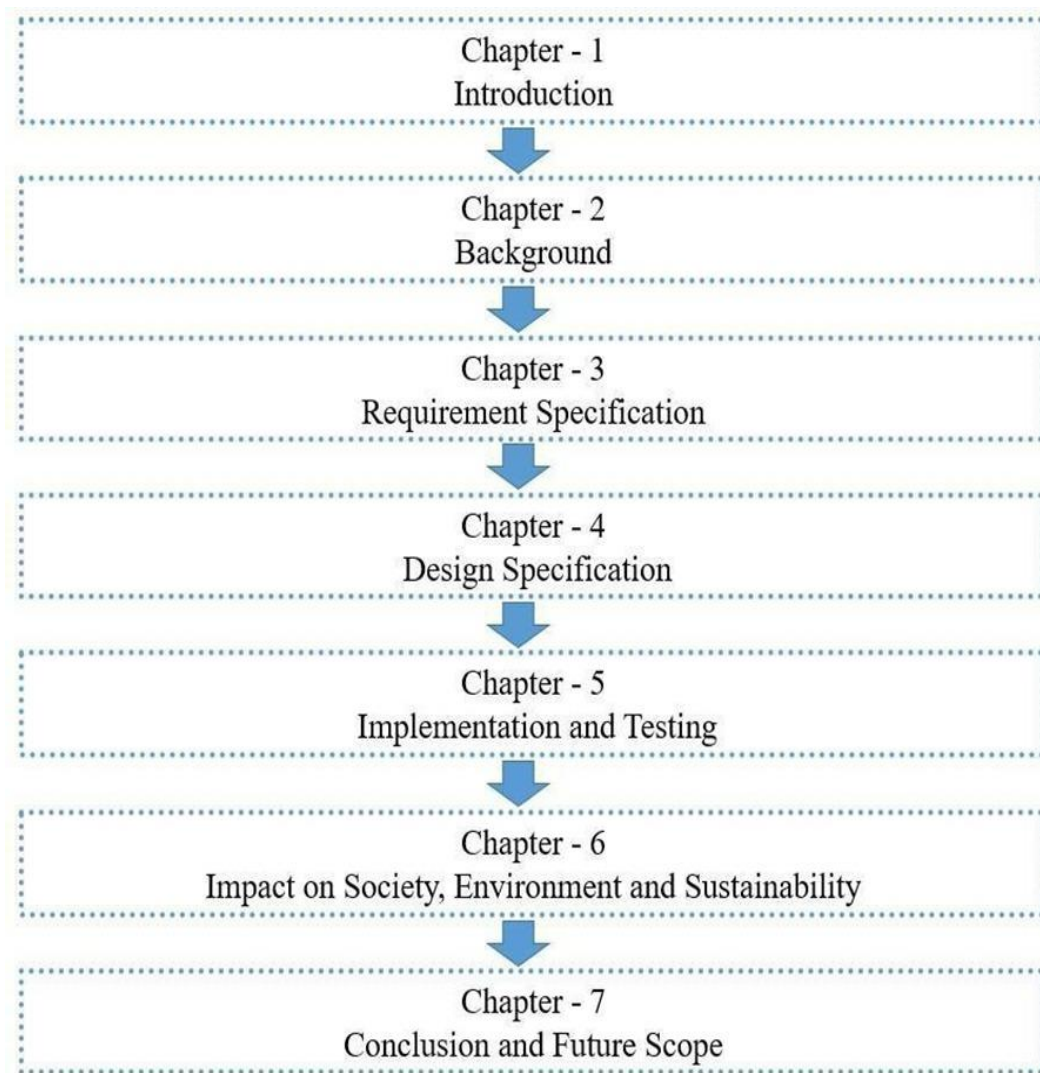
1.5 Scope and Limitations

Scrapwala's scope consists of implementing a platform designed to change the traditional system into an online one in Bangladesh. It's a mission to conquer conventional barriers by offering users a clean and stable scrap sell interface. Scrapwala wants to participate in this journey and contribute to Bangladesh's pristine environment. It is also an excellent opportunity for recycling business owners and customers. In the future, scrap in the city will be reduced by implementing this modernization. For a customer, selling their scrap for good value and cleaning their environment when it gets recycled or reused is also a win-win situation. But this challenge is complex, though Scrapwala needs to work hard to get as much scrap and customer interest in it as possible. Here are some potential limitations:

- ❖ **Technology Adoption:** Digital literacy and internet access are crucial for the effective use of online platforms, especially in rural areas, where limited or unreliable internet access may hinder its usability. Unreliable or limited internet access in some regions can hinder the platform's usability.
- ❖ **Infrastructure:** Establishing and maintaining a robust logistics network and strategically located storage facilities are crucial for efficiently collecting and processing scrap materials.
- ❖ **Operational Challenges:** Scalability and quality control are crucial for efficient recycling and resale of scrap materials, requiring significant investment in infrastructure and workforce.
- ❖ **Customer Engagement:** Building awareness and trust among potential customers is crucial for selling scrap online, as they may be skeptical or need to understand its benefits fully. Ensuring sufficient incentives motivates customers to use the platform.

- ❖ **Financial Constraints:** The platform's development and expansion may require significant funding while managing operational costs such as logistics, labor, and technology maintenance is crucial for profitability.

1.6 Report Organization



Developing a thorough report layout for Scrapwala - Online Based Scrap Management System Service entails organizing several parts to highlight the specifics of the project, its stages of development, its features, and its results. An outline for the report layout may be seen up.

1.7 Summary

Scrapwala is an innovative online-based scrap management system that aims to revolutionize the scrap industry by providing a centralized platform connecting customers, agents, and recycling vendors. The platform offers a user-friendly marketplace for customers to sell their scrap, manage their accounts, and track their orders. It also features an efficient admin panel for administrators to collect customer information, track order details, and maintain vendor relationships. By digitizing the scrap management workflow, Scrapwala enhances efficiency, transparency, and convenience for all stakeholders. The primary objectives of Scrapwala include:

- Creating a user-friendly platform.
- Centralizing the process.
- Automating processes.
- Ensuring transparency and accountability.
- Promoting sustainability and the circular economy.

By achieving these objectives, Scrapwala aims to revolutionize the scrap management industry, making it more efficient, transparent, and sustainable for all stakeholders involved.

CHAPTER 2

Literature Review

2.1 Overview

Scrapwala is an online platform that facilitates the buying and selling of scrap materials, promoting recycling, economic opportunities, and environmental sustainability. Bikroy.com offers a variety of products for buying and selling, while SWAP.com offers personalized orders and delivery. It also assists organizations in reducing selling procedures, bulk purchases and organizing Activation Points for employees.

2.2 Related Works

Examining analogous platforms, technologies, and studies that tackle Scrap Management System, user interfaces, security, and customized services are all part of the related study for Scrapwala. This is a summary of relevant literature:

- ❖ **Available Scrapwala Platforms:** Examine and evaluate the features, advantages, and disadvantages of the Online Scrap Management System Services currently in use. Examine well-known websites like Bikroy.com, swap, or corporate scrap solutions to learn about features, advancements, and user experience.
- ❖ **User Interface and Experience (UI/UX):** Research recommendations and ideas of UI/UX for web applications, emphasizing user-friendly interfaces, simple navigation, and increased user engagement. Analyze popular scrap selling or related buy-sell websites focusing on user-friendly design.
- ❖ **Security Measures in Web Applications:** To protect user data and guarantee platform security, examine industry-standard security protocols, encryption techniques, and compliance standards. Also, examine research articles or case studies about developing secure web applications.

- ❖ **Agile Development Methodologies:** Review publications or case studies discussing using Agile approaches to create web applications. Consider how collaborative and iterative methods can help develop complex systems like Scrapwala platforms.
- ❖ **Academic Research in Scrap Management:** Examine scholarly articles, journals, and conference proceedings that concentrate on recycling and scrap-related topics such as user behavior analysis, travel platform user happiness, or advancements in technology in the scrap industry.
- ❖ **Bikroy:** is basically for buying and selling only in a C2C-based model, and they have a vast category like Home & Living, Electronics, Essentials, Business & Industry, and more.
- ❖ **Swap:** Customers can purchase anything by personalized orders and sell and exchange their unneeded or surplus products such as smartphones, laptops, appliances, vehicles, etc.

Consolidating knowledge from these connected activities will yield important data, standards, and ideas for creating, constructing, and improving Scrapwala.

2.3 Comparison between existing works

A comparative analysis for "Scrapwala - Online Based Scrap Management System Service" involves assessing similar existing platforms or systems in the market.

Here's a breakdown for a comparative analysis:

Tab 2.3.1: Comparative analysis with previous work

SL No	Website name		Bikroy	Swap	Scrapwala
1	Business Model	B2B	No	No	Yes
		B2C	No	Yes	Yes

		C2C	Yes	Yes	No
2	Homepage		Yes	Yes	Yes
3	Account		Yes	Yes	Yes
4	Categories		Yes	Yes	Yes
5	Search		Yes	Yes	No
6	Contact		Yes	Yes	Yes
7	About		Yes	Yes	Yes
8	Request for Scrap		No	No	Yes
9	Selling only scrap		No	No	Yes
10	Payment types		Yes	Yes	Yes
11	Track order		Yes	Yes	Yes
12	Live chat		Yes	No	Yes

Scrapwala significantly upgrades traditional scrap management methods by leveraging technology to provide a more efficient, transparent, and user-friendly service. Its focus on sustainability and scalability positions it as a forward-thinking solution in the scrap management industry, capable of addressing the inefficiencies and limitations of existing systems.

2.4 Open Issues

Many problems in the scrap management sector prevent effective and transparent methods for purchasing, processing, and selling unwanted materials. We have also searched for any platform for it but we did not find any without some Facebook page. A specific platform is needed for customers to connect with agents and recycle vendors. It leads to inefficient delays and insufficient insight into the scrap management process. The traditional way of scrap management solutions depends significantly on manual processes, which rely on

physical documents and phone calls. This process takes too much time, and the error-prone nature of these processes can hamper scalability. Often, customers need help tracking the progress of their scrap orders and verifying the value they receive for their materials. Her lack of accountability and transparency causes renovation in the industry. We have visited local scrap seller also and understand how this thing will go. If we look at physical scrap shops, they are in specific areas with limited access to customers because customers may reside in distant places, which leads to inconvenience, and further money and transportation are needed.

2.5 Summary

"Scrapwala - Online Based Scrap Management System Service (SMSS)" has challenges in combining various features to satisfy system administrators, planners, and users while preserving a unified and intuitive user experience. Another area for improvement is balancing strong security measures without sacrificing the platform's usability. There are also constant issues in maintaining scalability to meet changing user needs, ensuring real-time data synchronization, and keeping up with changing industry standards and technical breakthroughs. Complying with privacy standards and creating an effective recommendation system based on user choices increases complexity. It will need careful planning, flexible development techniques, and ongoing adaptation to satisfy the interests of many stakeholders to overcome these obstacles.

CHAPTER 3

Requirement Analysis and Design Specification

3.1 Overview

Scrap Wala's platform development methodology involves initiation, requirement analysis, design specification, development, deployment, integration, user training, and maintenance. It consists in defining goals, identifying stakeholders, conducting feasibility studies, analyzing requirements, creating use cases, testing, ensuring quality, providing user training, and maintaining communication for a successful outcome.

3.2 System Design

Use case Diagram are given below:

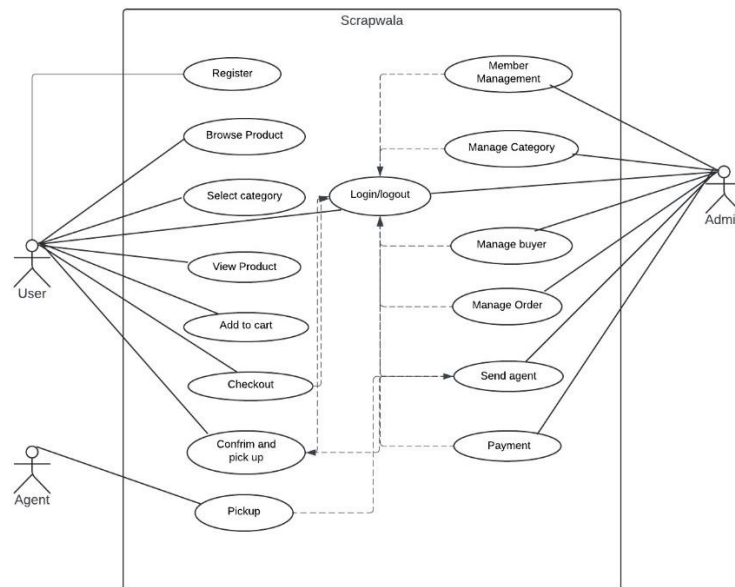


Fig 3.2.1: Scrapwala Use case Diagram

The diagram for Scrapwala shows interactions between Users, Agents, and Admins, detailing functionalities like registration, product browsing, category selection, order management, and pickup processes.

Admin and user Flowchart

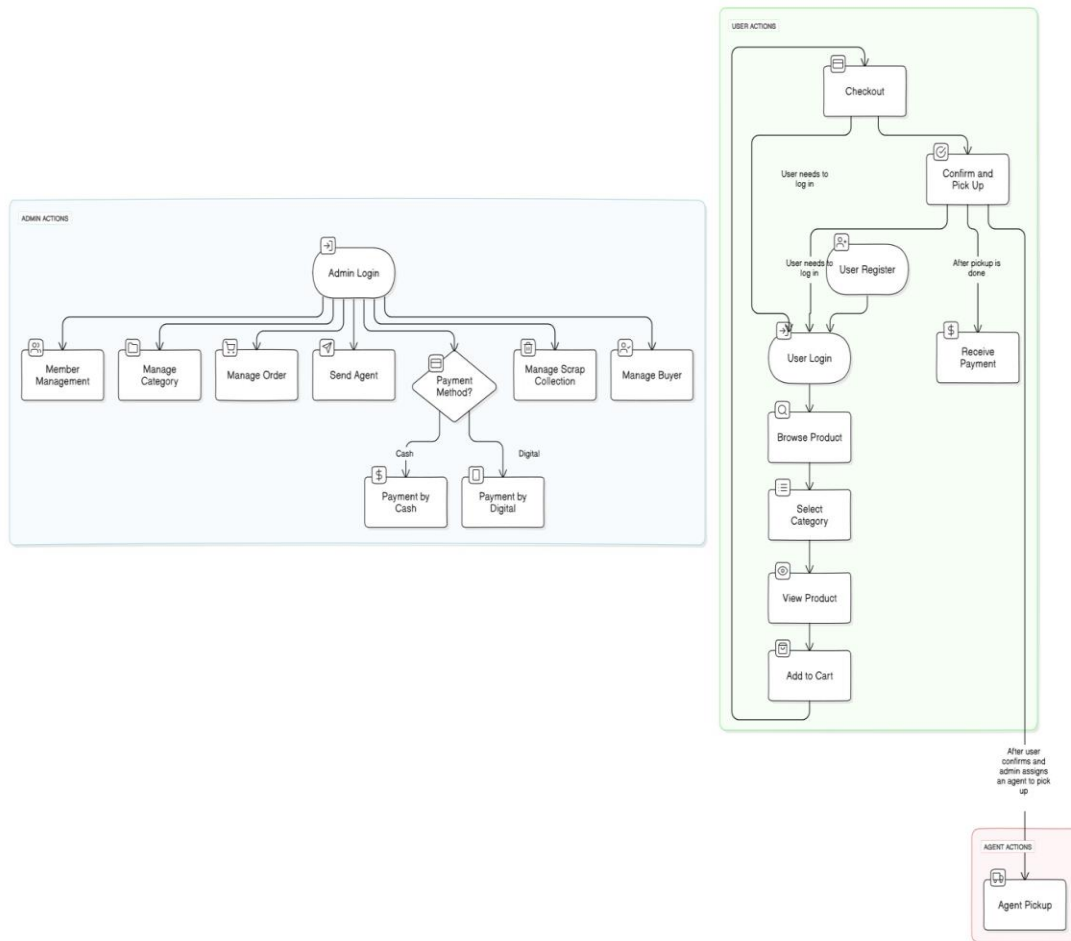


Fig 3.2.2: Scrapwala Flowchart

The Scrapwala platform's flowchart outlines the actions of users, admins, and agents. Users register, browse, select products, add items to their cart, and checkout. Admins manage members, categories, orders, scrap collection, and buyers, dispatch agents for pickup, determine payment methods and oversee the process. Agents pick up products from users as directed by the admin. This workflow promotes efficient interactions among users, admins, and agents, ensuring effective scrap management on the platform.

Sequence Diagram For admin

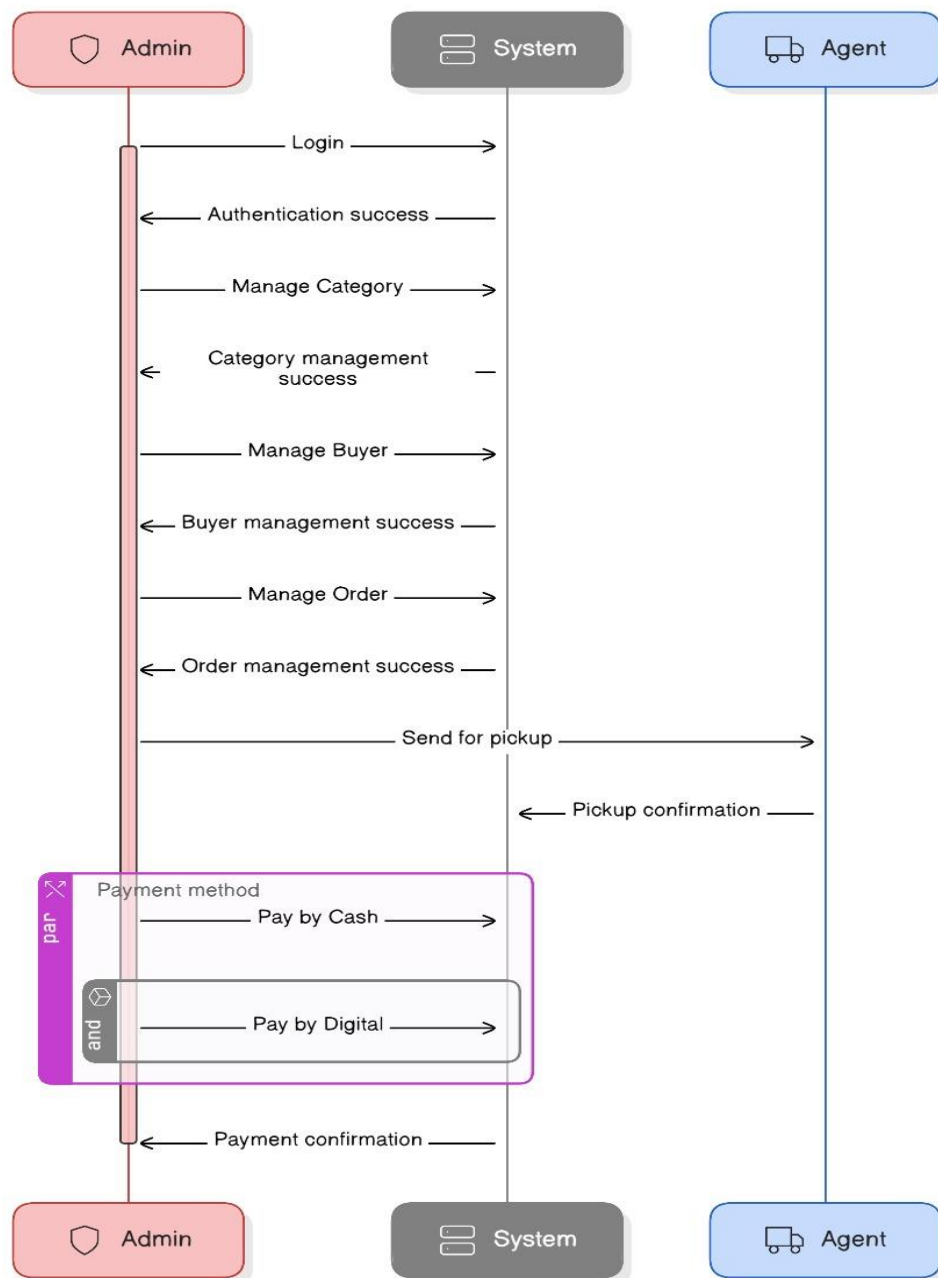


Fig 3.2.3: Scrapwala Sequence Diagram For admin

The sequence diagram for Scrapwala details the interactions between Admin, System, and Agent from login to payment confirmation, including category, buyer, order management, and pickup coordination.

Sequence Diagram For user

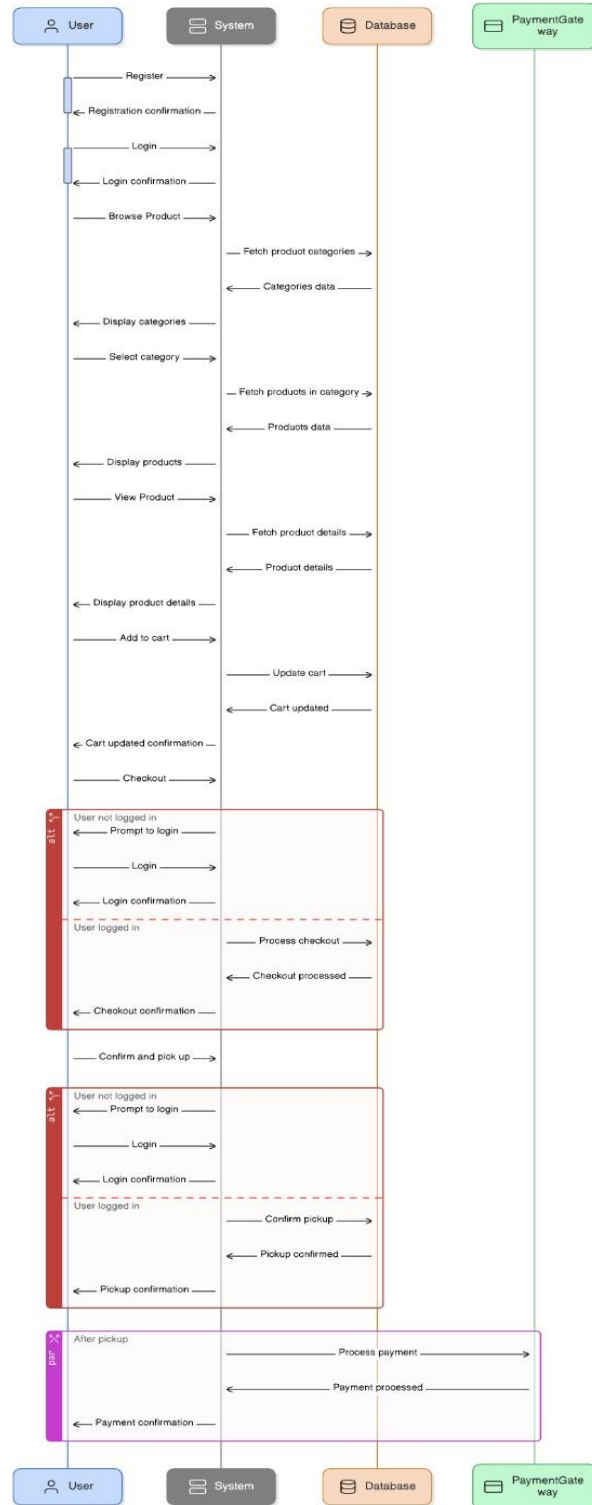


Fig 3.2.4: Scrapwala Sequence Diagram For user

Entity Relationship

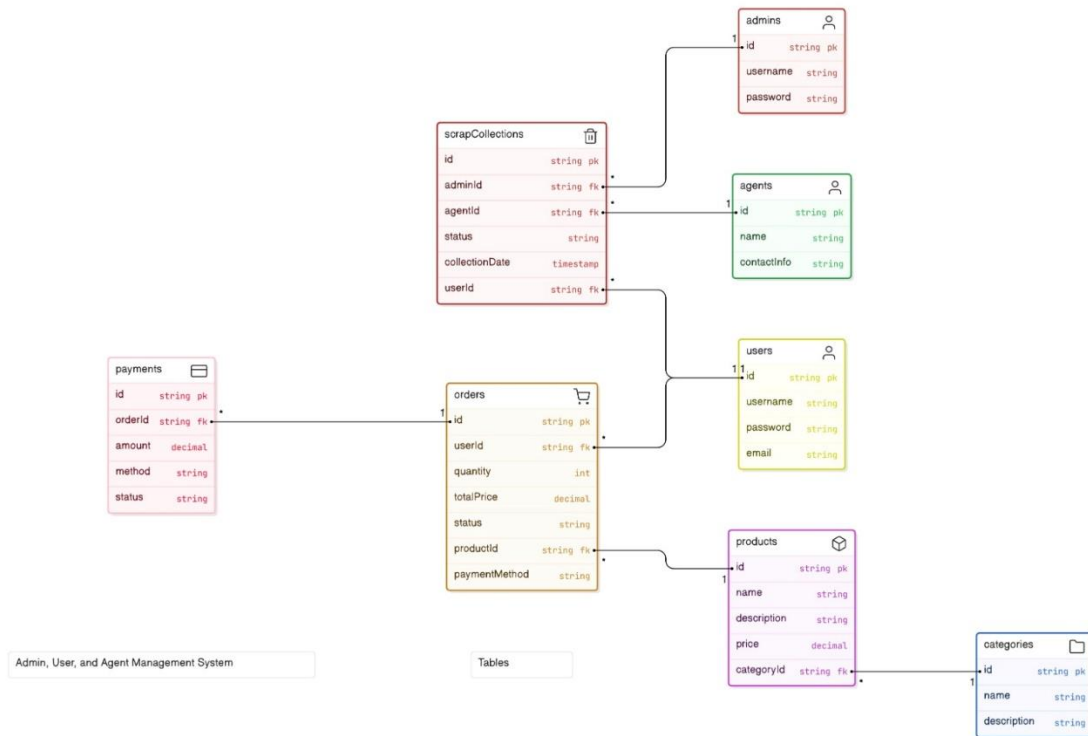


Fig 3.2.5: Scrapwala Entity Relationship

This Diagram presents an analysis of the Entity-Relationship (ER) diagram for the Scrapwala platform, a comprehensive management system designed to streamline interactions between admins, users, agents, and other components involved in scrap management. The ER diagram provides a detailed view of how various entities are interconnected, enhancing the operational efficiency and transparency of the platform.

3.3 Hardware/ Software Requirement

A. Hardware Requirements:

- ❖ **Servers and Hosting:** The Scrapwala platform will be hosted using cloud hosting services like AWS and Google Cloud Platform, with dedicated or virtual private servers depending on scalability and performance needs.

- ❖ **Computers and Devices:** Agents require internet-connected smartphones or tablets to access the Scrapwala app or website for pickup requests and updates and computers for administrative tasks and backend management.
- ❖ **Networking Equipment:** The office and field agents have routers, switches, and networking cables for reliable internet connectivity.

B. Software Requirements:

- ❖ **Front End Technologies:** Scrapwala's front-end interface is built using HTML, CSS, and JavaScript, with React being the preferred JavaScript library for efficient interactive user interface creation.
- ❖ **Back-end Technologies:** **Node.js** is a server-side JavaScript execution environment, while Express.js is a web application framework. MongoDB is a NoSQL database, and Firebase is a back-end service platform.
- ❖ **Development Tools:** Visual Studio Code is a lightweight and versatile IDE for coding and debugging, while Chrome DevTools are browser-based tools for debugging and editing front-end code.
- ❖ **Security Tools:** SSL certificates ensure secure internet data transmission, while firewalls and intrusion detection systems protect against unauthorized access and attacks.
- ❖ **Deployment Tools:** CI/CD tools like Jenkins and GitLab automate deployment processes and guarantee code quality.

3.4 Project Management and Financial Analysis

A. Project Management:

- **Project Objectives:**
 - A. To develop a Specific website for selling scrap
 - B. To give a one-stop solution for consumers of unused products

- **Project Timeline:**
 - A. Phase 1: Project Planning and Research (2-4 weeks)
 - B. Phase 2: Design and Prototyping (6-8 weeks)
 - C. Phase 3: Front-End Development (8-12 weeks)
 - D. Phase 4: Back-End Development (10-14 weeks)
 - E. Phase 5: Testing (4-6 weeks)
 - F. Phase 6: Deployment (2-4 weeks)
 - G. Phase 7: Post-Launch and Marketing (Ongoing)
- **Resource Planning:**
 - A. Equipment and Tools:**
 - Development and Testing Servers
 - High-performance Computers for Development Team Design Software (e.g., Adobe Creative Suite)
 - Collaboration Tools (e.g., Slack, Trello, or project management software)
 - Version Control System (e.g., Git)
 - Testing Tools (e.g., Selenium for automated testing)
 - B. Software and Technologies:**
 - Front-End Technologies (e.g., React and Express.js)
 - Back-end technologies (e.g., Node.js)
 - Database Management System (e.g., MongoDB)
 - Server Hosting (e.g., AWS, Azure, or Google Cloud)
 - Payment Gateway Integration (e.g., Bkash, Nagad, PayPal)
 - Security Software and SSL Certificates
 - C. Data and Content:**
 - Product Data: Provided by Scrapwala
 - Product Images: Provided by Scrapwala or obtained through agreements with the customer.
 - User Documentation: Prepared by the technical writing team.
 - D. Training and Skill Development:**
 - Ensure the development team has the necessary training and skills in e-commerce development, security, and database management.
 - Provide additional training on specific technologies and tools as needed.
- **Risk Management:** SWOT analysis involves assessing the Strengths, Weaknesses, Opportunities, and Threats of a project. Here's a SWOT analysis for the Online-Based Scrap Management System Service (Scrapwala):

SWOT ANALYSIS

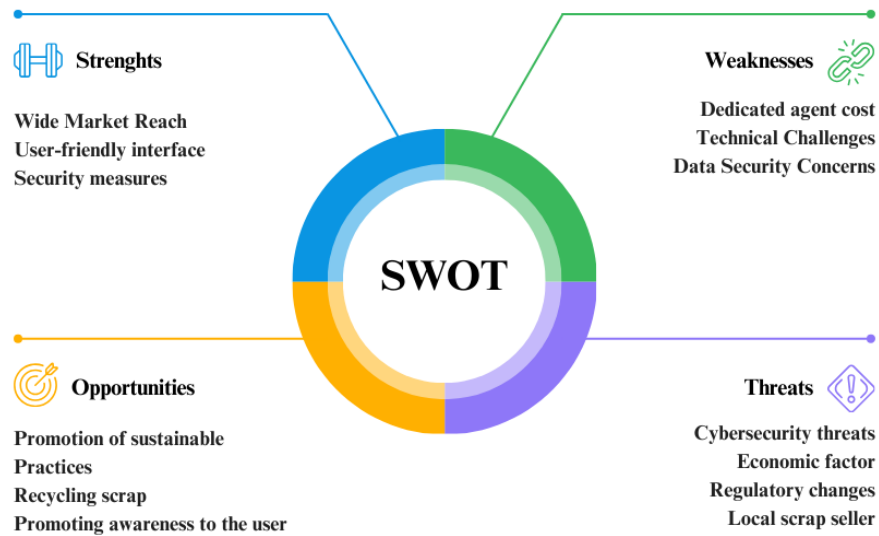


Fig 3.4.1: Scrapwala Swot Analysis

- **Communication Plan:**

- A. Stakeholder Meetings:**

- **Purpose:** Update stakeholders on project requirements, gather progress and gather feedback.
 - **Participants:** Team members and stakeholders.
 - **Frequency:** Bi-weekly or as specified in the project plan.

- B. Change Control Meetings:**

- **Purpose:** Discuss and approve any changes to the project scope or requirements.
 - **Participants:** Supervisor and team members.

- B. Financial Analysis:**

To perform a financial analysis for the Scrapwala project, the below costs have been made:

Table 3.4.2: Estimated Cost for Web Development Project

SN	Components	Estimated Cost (BDT)
1	Domain and Hosting	5000
2	Visiting Stakeholders	6000
3	Doing Online Course or Training for learning new technology	4000
4	Miscellaneous (e.g., licenses, tools)	7000
5	Contingency	2200
Total Estimated Cost		24200

In preparation for Scrapwala, a comprehensive financial analysis projects total costs amounting to BDT 24,200. This budget covers essential expenses such as domain registration and hosting, stakeholder engagement through visits, technology training for proficiency, miscellaneous items including licenses and tools, and a contingency fund for unforeseen needs. These investments are pivotal in establishing a resilient online platform for efficient scrap management, ensuring operational stability, and supporting our goals of promoting sustainability and contributing to a circular economy.

3.5 Summary

Scrapwala's platform development methodology involves initiation, requirement analysis, design specification, development, deployment, integration, user training, and maintenance. Functional requirements include a homepage, account, categories, track order, search, contact, about, request, cart, and payment options. Non-functional requirements include security, scalability, usability, availability, and maintenance. The proposed methodology uses React, Express.js, Node, and MongoDB. Financial analysis includes survey, transportation, and hospitality costs.

CHAPTER 4

4.1 Overview

The implementation plan for the Scrapwala platform, focusing on the prototype design and system testing phases. The goal is to create a user-centric, efficient, and robust online-based scrap management system that connects customers, agents, and recycling vendors. The implementation plan ensures the platform is well-designed, thoroughly tested, and ready for deployment.

4.2 Prototype Design

A. Implementation of Database

We have integrated our data into MongoDB Database, ensuring that all website data is stored on the MongoDB server, thereby providing a reliable foundation for the application's functionality, ensuring data integrity, security, and performance.

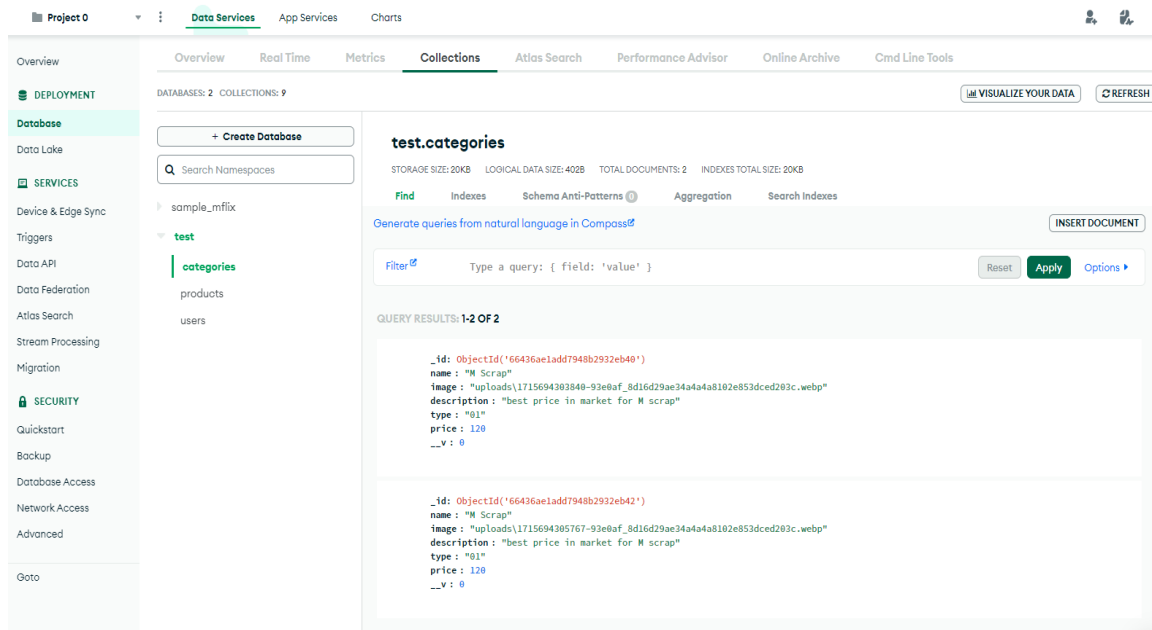


Figure 4.2.1: Landing Page Design.

B. Implementation of Front-end/Back-end Design

The front-end design of "Scrapwala - Online Based Scrap Management System Service (SMSS)" focuses on offering a user-friendly WebView, providing a simple and efficient experience for customers. The interface is intuitive and responsive, allowing easy navigation and personalized scrap categories. Users can select their scrap with a single click and request pick-up, saving time and effort. Easy and simple for online-based scrap service in the city.

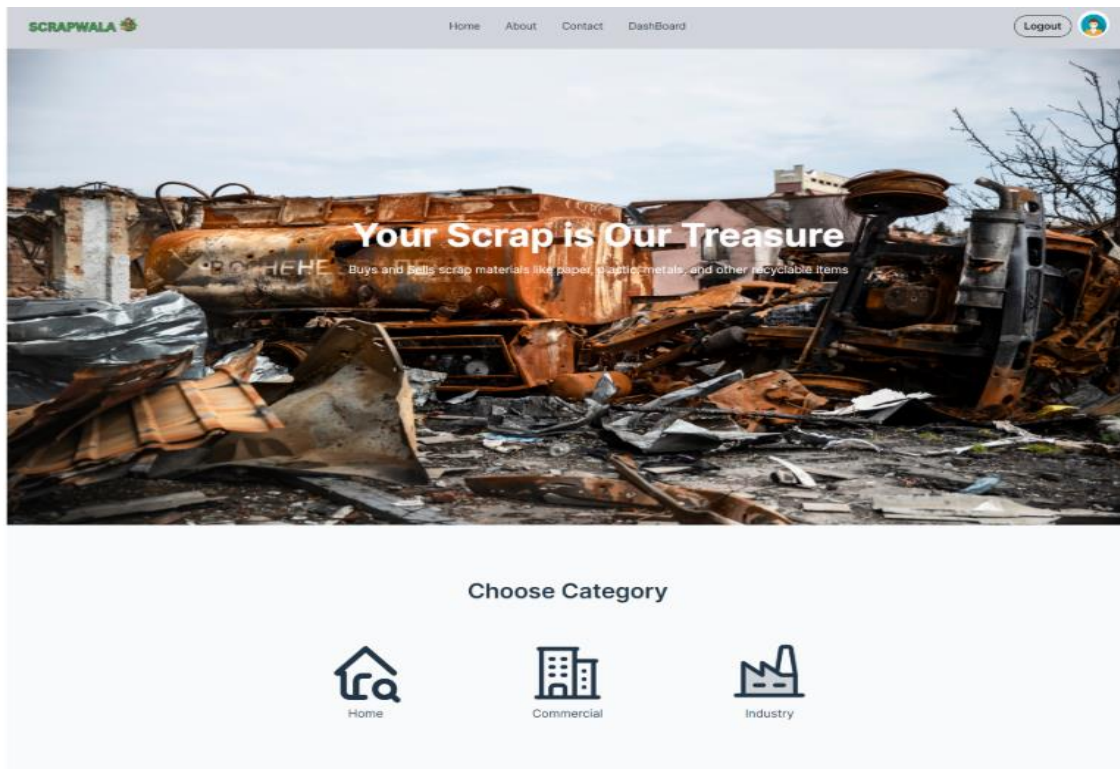


Figure 4.2.2: Home page.

The Scrapwala home page features a clear, user-friendly design with essential navigation links. The central banner highlights the mission of turning waste into resources. Users can select scrap categories (Home, Commercial, Industrial) via icons. Key sections include "About Us," "How It Works" (with process icons), and "Why Scrapwala?". Customer reviews add credibility, while the footer contains company info and social media links, providing a comprehensive, engaging user experience.

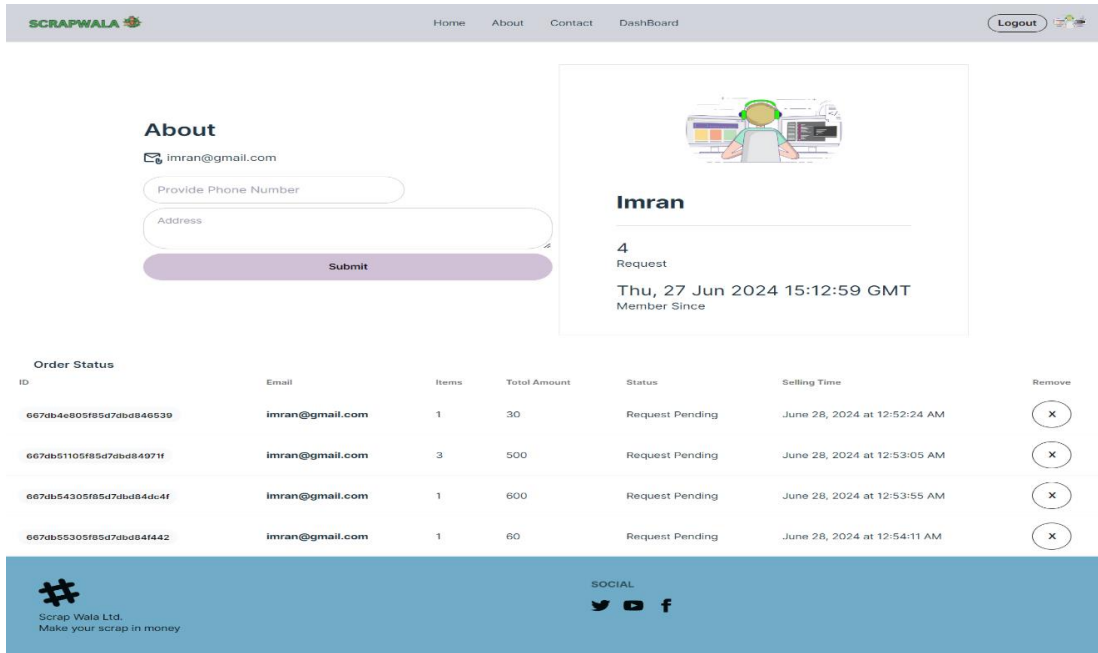


Figure 4.2.3: User account.

This webpage is scrapwala User page, here we can find order details and user details.

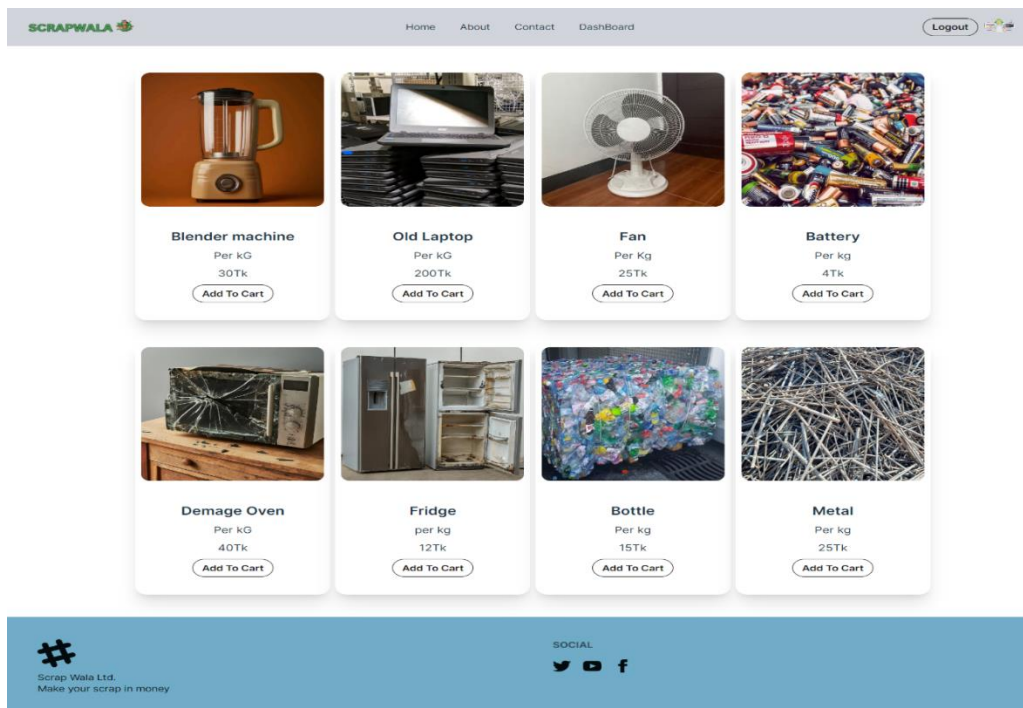


Figure 4.2.4: Product page.

Here user can find category-based products, user can also select product and add to cart for pick up request.

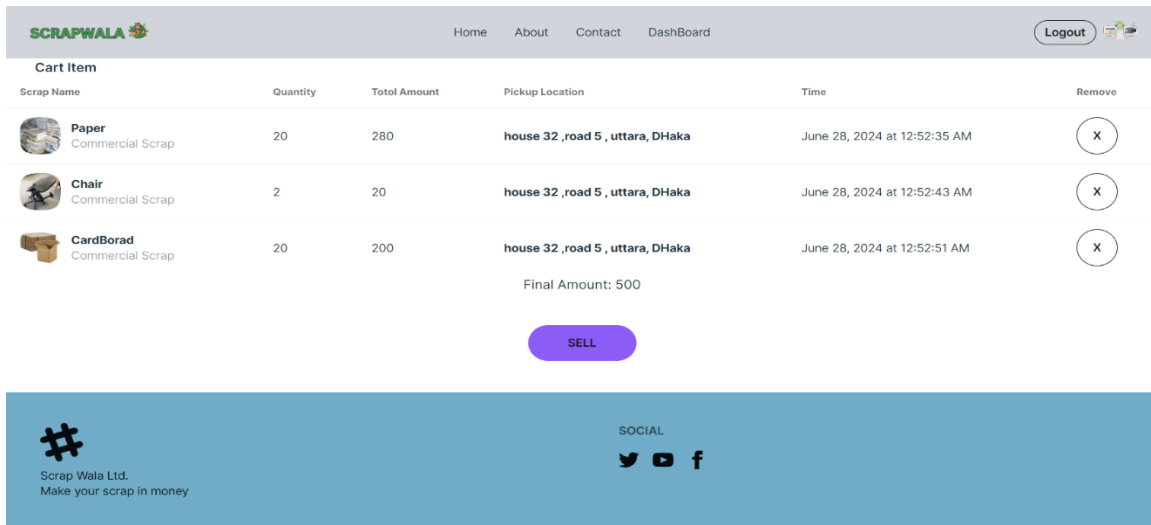


Figure 4.2.5: Cart Option

This page shows after user select product from category page and proceed to sell their product.



Figure 4.2.6: Admin Dashboard.

The Scrapwala admin dashboard features a welcoming interface with a friendly character image and easy navigation via a sidebar with options for managing categories, buyer information, members, scrap, and sales. The layout ensures efficient admin access to various platform functions. A "Back to Home" button quickly returns to the main page.

Add Category Add Buyer Info Categories Member Management Scrap Management Scrap Sell Buyers Info Back To Home	SCRAP MANAGEMENT HOME / DASHBOARD / SCRAP MANAGEMENT							
	Order Status Collected: 6 Request Pending: 0 Request Accepted: 1 Man Approching: 3							
	ID	Seller Name	Seller Email	Items	Total Amount	Status	Selling time	Remove
	667dafef05f85d7dbd7edc35	enamul@gmail.com	Enamul	2	308	Man Approching Update	June 28, 2024 at 12:27:11 AM	X
	667daf3005f85d7dbd7edc46	enamul@gmail.com	Enamul	2	1009.2	Collected Update	June 28, 2024 at 12:28:00 AM	X
	667daf5d05f85d7dbd7edc56	enamul@gmail.com	Enamul	3	699.75	Collected Update	June 28, 2024 at 12:28:45 AM	X
	667dafad05f85d7dbd7edc70	maruf@gmail.com	Maruf	3	305	Request Accepted Update	June 28, 2024 at 12:30:05 AM	X
	667dafbe05f85d7dbd7edc7d	maruf@gmail.com	Maruf	1	400	Man Approching Update	June 28, 2024 at 12:30:22 AM	X
	667dafce05f85d7dbd7edc88	maruf@gmail.com	Maruf	1	249.75	Collected Update	June 28, 2024 at 12:30:38 AM	X
	667db04a05f85d7dbd7efdd4	nayem@gmail.com	Nayem	2	949.84	Man Approching Update	June 28, 2024 at 12:32:42 AM	X
	667db05a05f85d7dbd7efde0	nayem@gmail.com	Nayem	1	700	Collected Update	June 28, 2024 at 12:32:58 AM	X
	667db06e05f85d7dbd7efdeb	nayem@gmail.com	Nayem	1	400	Collected Update	June 28, 2024 at 12:33:18 AM	X
	667db07005f85d7dbd7efdf6	nayem@gmail.com	Nayem	1	100	Collected Update	June 28, 2024 at 12:33:33 AM	X

Figure 4.2.7: Scrap management.

This page is scrapwala order management where admin can manage order and do further processing.

Add Category Add Buyer Info Categories Member Management Scrap Management Scrap Sell Buyers Info Back To Home	SCRAP SELL HOME / DASHBOARD / SCRAP SELL			
	Total Scrap Collected			
	Home Scrap Total Quantity: 47.46 kg Total Price: 1948.7 tk	Commercial Scrap Total Quantity: 101 kg Total Price: 810 tk	Industrial Scrap Total Quantity: 20 kg Total Price: 400 tk	
	Title	Type	KG	Price Tk
	Demage Oven	Home	24.98	999.2
	Chair	Commercial	1	10
	Bottle	Home	5	75
	Metal	Home	4.99	124.75
	Old Laptop	Home	2.5	500
	Metal	Home	9.99	249.75
	Paper	Commercial	50	700
	Electric wire	Industrial	20	400
	Retail Shelving	Commercial	50	100

Figure 4.2.8: Scrap Sell page.

The Scrap Sell page shows how many scraps were collected from the user based on category, kg and amount price.

	BUYERS INFO							
	HOME / DASHBOARD / BUYERS INFO							
Add Category								
Add Buyer Info								
Categories								
Member Management								
Scrap Management								
Scrap Sell								
Buyers Info								
Back To Home	Home Scrap		Commercial Scrap			Industrial Scrap		
	Total Quantity: 4 kg		Total Quantity: 26 kg			Total Quantity: 20 kg		
	Total Price: 2500 tk		Total Price: 8735 tk			Total Price: 8000 tk		
	Total Profit: 2000 tk		Total Profit: 2615 tk			Total Profit: 12000 tk		
	Name	Phone & Address	Scrap Type	Scrap Category	Quantity	Price	Sell Price	Profit
	Date							
	Dehan	01963528988 225, khilgaon, tilpapara, 1219 ,Dhaka	Home	Demage Oven	1 KG	1000TK	1500TK	500TK
								June 28, 2024 at 12:37:00 AM
	Aziz	01963528977 225, khilgaon, tilpapara, 1219	Commercial	Paper	25 KG	349TK	450TK	2525TK
								June 28, 2024 at 12:39:00 AM
	Azhar	40320384999 4829 BLACKWELL STREET	Industrial	Electric wire	20 KG	400TK	1000TK	12000TK
								June 28, 2024 at 12:39:00 AM
	Azhar	019635289444 225, khilgaon, tilpapara, 1219 ,Dhaka	Home	Old Laptop	3 KG	500TK	1000TK	1500TK
								June 28, 2024 at 12:40:00 AM
	Imon	01963528999 150, motijheel c/a, 1000 Dhaka	Commercial	Chair	1 KG	10TK	100TK	90TK
								June 28, 2024 at 12:41:00 AM

Figure 4.2.7: Buyer info.

The Buyers Info section of the Scrapwala admin dashboard provides summaries of home, commercial, and industrial scrap transactions, including quantities, prices, and profits. A detailed table lists buyer information, such as names, contact details, scrap types, and transaction specifics. This layout allows admins to monitor and manage buyer transactions and scrap sales efficiently.

4.3 System Testing

An organized strategy is used in the testing implementation for " Scrapwala - Online Based Scrap Management System Service (SMSS)" to guarantee the platform's performance, security, usability, and usefulness. This is a summary of the testing protocols:

A. Testing Types:

- ❖ **Unit testing:** Check that individual parts, features, and modules operate as intended.
- ❖ **Integrity testing:** Examine how different modules interact to ensure functionality and integration go smoothly.

- ❖ **System Testing:** Verify that the behavior and general functionality of the system are by the specified criteria.
- ❖ **User Acceptance Testing (UAT):** Involve stakeholders in scenario-based testing based on real-world scenarios to ensure the platform fulfills user demands.
- ❖ **Security testing:** Conduct security assessments to find weaknesses and ensure a strong defense against attacks.
- ❖ **Performance testing:** Check the responsiveness and stability of the system by measuring its performance under varied loads.

B. Testing Procedures:

- ❖ **Test Case Development:** Create comprehensive test cases covering all functionalities, edge cases, and user scenarios.
- ❖ **Execution and Reporting:** Systematically Execute test cases, record results, and generate reports detailing pass/failed scenarios.
- ❖ **Bug Tracking:** Bug tracking tools log and monitor identified issues, assign priorities, and track resolutions.
- ❖ **Regression Testing:** After bug fixes or new feature implementations, perform regression testing to ensure existing functionalities remain unaffected.
- ❖ **User Feedback Incorporation:** Integrate user feedback from UAT into testing cycles to address user experience issues and enhance usability.

4.4 Summary

The implementation of the Scrapwala platform involves several key phases. **Prototype Design** focuses on creating detailed UI/UX designs for a user-friendly interface. **Database Implementation** establishes a structured data model to manage admins, agents, users, and transactions efficiently. **Front-end Design** ensures a visually appealing and intuitive interface, facilitating easy navigation and user interaction. **System Testing** rigorously checks all components, including unit, integration, functional, performance, and security testing, to ensure the platform is robust, efficient, and secure before deployment.

CHAPTER 5

Result and Analysis

5.1 Overview

We successfully implemented the Scrapwala platform, achieving a user-friendly interface validated through extensive user testing. Our robust database design ensures efficient management of all operations, while our responsive front-end design guarantees compatibility across various devices, enhancing user experience. Comprehensive system testing confirmed the platform's reliability, performance, and security. Our performance tests demonstrated its ability to handle high traffic and stress conditions effectively. Overall, we are confident that the platform is ready for deployment, promising significant improvements in scrap management efficiency.

5.2 Experimental

We conducted performance testing to ensure the Scrapwala platform operates efficiently under various conditions. Our focus areas included:

- ❖ **Load Testing:** We simulated multiple users accessing the platform simultaneously to evaluate its response times and overall performance. The platform successfully handled peak loads, maintaining swift response times and stable operation.
- ❖ **Stress Testing:** We pushed the platform beyond its average operational capacity to identify its breaking point and assess its recovery mechanisms. The platform demonstrated resilience by gracefully managing high stress levels and recovering without significant downtime.
- ❖ **Scalability Testing:** We increased the load progressively to assess the platform's scalability. The platform-maintained performance and responsiveness, proving its ability to scale up effectively.
- ❖ **Latency Testing:** We measured the delay between user actions and system responses to ensure real-time interactivity. The platform exhibited minimal latency, providing a seamless user experience.

5.3 Performance

Our system performance testing aimed to ensure optimal efficiency across various metrics:

- ❖ **Response Time:** The platform maintained fast response times during peak usage, ensuring a smooth user experience.
- ❖ **Throughput:** We validated the platform's ability to process a high volume of transactions, confirming its effectiveness in handling large-scale operations.
- ❖ **Resource Utilization:** By monitoring CPU, memory, and network usage, we ensured efficient resource management. The platform demonstrated balanced resource utilization, preventing bottlenecks and ensuring consistent performance.
- ❖ **Error Rate:** We evaluated the frequency of errors during operation. The platform maintained a low error rate, indicating high reliability and stability.

5.4 Summary

Through our comprehensive testing process, we ensured the Scrapwala platform was robust, efficient, and ready for deployment. Performance and system performance testing demonstrated the platform's ability to handle high traffic, stress conditions, and large-scale operations while maintaining fast response times and low error rates. We are confident that the platform will significantly enhance scrap management processes, providing a reliable and user-friendly service.

CHAPTER 6

Impact on Society, Environment and Sustainability

6.1 Impact on Life

Our Scrapwala platform profoundly impacts daily life by transforming how scrap materials are managed. Key impacts include:

- ❖ **Convenience:** Simplifies the process of selling, collecting, and recycling scrap, reducing the burden on individuals and businesses to manage waste.
- ❖ **Cleaner Environments:** Leads to cleaner living and working spaces by encouraging efficient waste management.
- ❖ **Financial Incentives:** Provides additional income opportunities for users by offering fair compensation for scrap materials.
- ❖ **Encouragement of Responsibility:** Fosters a sense of responsibility towards waste management among individuals and communities.
- ❖ **Improved Quality of Life:** The combination of cleaner environments and financial benefits improves participants' overall quality of life.

6.2 Impact on Society & Environment

The introduction of Scrapwala significantly impacts society and the environment through the following:

- ❖ **Reduction in Landfill Waste:** Promotes efficient recycling of scrap materials, decreasing the volume of waste sent to landfills and reducing associated environmental hazards.
- ❖ **Pollution Reduction:** This helps lower pollution levels by ensuring proper disposal and recycling of materials and protecting natural habitats and biodiversity.
- ❖ **Cultural Shift:** Encourages a culture of recycling and environmental responsibility within communities, promoting collective action towards sustainability.
- ❖ **Economic Growth:** Creates job opportunities for agents and recycling vendors, stimulating local economies and supporting community development.

- ❖ **Resource Conservation:** Contributes to conserving natural resources by recycling scrap materials, reducing the need for raw material extraction and manufacturing.

6.3 Ethical Aspects

We are committed to maintaining high ethical standards throughout Scrapwala's operation. Our platform ensures transparency in transactions, provides fair compensation for scrap materials, and builds trust with our users. We respect user privacy, ensure that all personal data is handled securely, and comply with data protection regulations. Our commitment to environmental ethics drives us to continually seek ways to reduce our carbon footprint and promote sustainable practices. We ensure that Scrapwala operates with integrity and social responsibility by aligning our operations with ethical principles.

6.4 Sustainability Plan

Our sustainability plan focuses on long-term environmental and social benefits. We aim to continuously improve our recycling processes to increase efficiency and reduce waste. Partnering with local and international recycling organizations lets us stay updated with the latest sustainable practices and technologies. We plan to implement educational programs to raise awareness about the importance of recycling and sustainable living. By actively engaging with communities, we aim to foster a culture of environmental stewardship. Additionally, we are committed to offsetting carbon emissions and investing in renewable energy sources to power our operations.

6.5 Summary

By encouraging effective and moral scrap management techniques, we enhance people's lives, society, and the environment through the Scrapwala platform. Our dedication to sustainability ensures that we keep coming up with new ideas and ways to streamline our operations, promoting an environmentally conscious culture. By offering cash incentives and job possibilities, we help local communities and promote economic progress. Scrapwala is a movement towards a cleaner, more sustainable future and a platform.

CHAPTER 7

Conclusion and Future Work

7.1 Conclusions

A major step towards revolutionizing scrap management has been taken with the creation of "Scrapwala - Online Based Scrap Management System Service". For system administrators, and consumers alike, the platform seeks facilitate the buying, recycling, and selling of various types of scrap. The system provides a convenient and efficient way for customers to sell their scrap by requesting pickups through the website. Through the provision of a cohesive, user-friendly interface, tailored suggestions, and strong security protocols, the platform caters to a wide range of user requirements while placing a premium on data privacy and moral behavior.

Scrapwala is an online platform that facilitates the buying and selling of scrap materials, promoting recycling, economic opportunities, and environmental sustainability. As Scrapwala continues to evolve and adapt to user needs, it holds the potential to become a cornerstone in the transition towards a more sustainable future. With its user-centric design and commitment to efficiency, Scrapwala stands as a beacon of progress in the journey towards responsible waste management and environmental stewardship.

7.2 Further Suggested Works

In the future, Scrapwala has various options to improve its influence and efficacy:

- ❖ **Mobile Application Development:** Producing a specific mobile application to make it simpler for clients and representatives to access and utilize, enhancing accessibility and user experience.
- ❖ **IoT Integration:** Increasing operational efficiency and transparency using Internet of Things (IoT) devices to track scrap collection and recycling activities in real time.
- ❖ **Data Analytics and Insights:** Using cutting-edge data analytics to get practical information about consumer behavior, scrap trends, and operational performance to improve decision-making.

- ❖ **Programs for Community Engagement:** Start campaigns to inform and involve nearby communities in environmentally responsible waste management techniques to promote environmental stewardship.
- ❖ **Expanded Service Offerings:** Broadening the scope of services to cover waste streams other than conventional scrap materials, like organic and electronic trash (e-waste).
- ❖ **Green Certification:** Seeking accreditations and support from environmental bodies to verify Scrapwala's dedication to sustainability and moral business conduct.

7.3 Limitations/ Conflict of Interests

While Scrapwala works to advance environmentally sustainable practices and moral scrap management, it encounters several obstacles and issues.

- ❖ **Regulatory Compliance:** Complying with the many legal frameworks that regulate recycling and waste management procedures in various jurisdictions and areas.
- ❖ **Technology Dependencies:** Dependence on internet connectivity and technology infrastructure can be problematic in places where access to digital resources is scarce.
- ❖ **Operational logistics:** Handling the intricate logistics of recycling, transportation, and scrap collection, particularly in crowded urban settings.
- ❖ **Competitive Environment:** Handling rivalry from reputable garbage management firms and neighborhood scrap dealers while balancing affordable prices and environmentally friendly operations.
- ❖ **Conflict of Interest:** Reducing the possibility of conflicts of interest between preserving environmental integrity and increasing profits and making sure that business activities are transparent.
- ❖ **Customer behavior:** Considering how different consumers are in their awareness and adoption of recycling methods impacts participation rates and overall operational effectiveness.

Scrapwala can maintain its innovative and leadership position in sustainable scrap management by taking proactive measures to overcome these constraints and difficulties. This will result in favorable effects on the environment and society and long-term company viability.

Reference

- বাংলাদেশে ইলেকট্রনিকস, গাড়ি, প্রপার্টি এবং চাকরি Bikroy. Available at: <https://bikroy.com/bn> (Accessed: 25 February 2024).
- E-commerces and re-commerce marketplace in Bangladesh: Buy, sell, or swap from swap.com.bd (no date) E-commerces and Re-commerce Marketplace in Bangladesh: Buy, Sell, or Swap from Swap.com.bd. Available at: <https://swap.com.bd/> (Accessed: 25 February 2024).
- A House of Complete Environment Management Adroit Environment Consultants Limited. Available at: <https://aecl-bd.org/> (Accessed: 26 February 2024).
- Sayeda Shahpara Shah and Syed Saad Andaleeb (2022) Dhaka has a waste management problem, The Daily Star. Available at: <https://www.thedailystar.net/opinion/views/news/dhaka-has-waste-management-problem-3079156> (Accessed: 26 February 2024).
- Dhaka suffers due to poor waste management - The Daily Observer. Available at: <https://www.observerbd.com/news.php?id=415203> (Accessed: 26 February 2024).
- প্লাস্টিক খাতে ১৫ লাখ মানুষের জীবিকা | plastic recycling | ekhon TV (2024) YouTube. Available at: <https://www.youtube.com/watch?v=7CH7tSrriG8> (Accessed: 28 May 2024).
- Scrap recycling business in Bangladesh || স্ক্রাপ রিসাইক্লিং বিজনেস ইন বাংলাদেশ (2021) YouTube. Available at: <https://www.youtube.com/watch?v=I-ySuMszf2U> (Accessed: 28 March 2024).
- বেচারাম দেউড়ির মেটাল মার্কেট: যেখানে ধুলাও বিক্রি হয় | metal market | scrap | The Business Standard (2023) YouTube. Available at: <https://www.youtube.com/watch?v=GpXeXHFeSsw> (Accessed: 28 May 2024).
- #1 - Node.js নিয়ে একটি ছোট্ট গল্প - Node.js tutorial bangla | express.js tutorial bangla (2020) YouTube. Available at: <https://www.youtube.com/watch?v=WC-g0JtEIwM> (Accessed: 28 June 2023).
- (2020) Free react JS tutorial - perfect react JS course for beginners | Udemy. Available at: <https://www.udemy.com/course/perfect-react-js-course/> (Accessed: 28 June 2023).
- Bangladesh sees imported scrap hike amid surging freight (2024) Kallanish Commodities. Available at: <https://www.kallanish.com/en/news/steel/market-reports/article-details/bangladesh-sees-rise-in-imported-scrap-prices-amid-freight-surge-0624/> (Accessed: 28 June 2024).

Appendix A

Course Outcomes, Complex Engineering Problems (EP) and Complex Engineering Activities (EA) Addressing

Title: Online-Based Scrap Management System Service (Scrapwala)

Students ID: 201-15-3559

CO Description for FYDP

CO	CO Descriptions	PO
Phase -I		
CO1	Integrate recently gained and previously acquired knowledge to identify a web-based travel management problem for the Final Year Design Project (FYDP)	PO1
CO2	Analyze different aspects of the goals in designing a solution for this FYDP	PO2
CO3	Explore diverse problem domains through a literature review, delineate the issues, and establish these goals for the FYDP	PO4
CO4	Perform economic evaluation and cost estimation and employ suitable project management procedures throughout the development life cycle of the FYDP	PO11
Phase -II		
CO5	Design and develop technical solutions and system components or processes that meet specified requirements, ensuring compliance with public health and safety standards, as well as considering cultural, socioeconomic, and environmental factors in this FYDP	PO3
CO6	Choose and apply appropriate methodologies, resources, and contemporary engineering and IT technologies to address complex engineering processes, encompassing prediction and modeling, while adhering to relevant constraints in this FYDP	PO5
CO7	Analyze societal, health, safety, legal, and cultural considerations, along with associated responsibilities, in the context of professional engineering practice and the resolution of this problem, employing logical reasoning guided by contextual understanding.	PO6
CO8	Comprehend and evaluate the enduring sustainability and impact of professional engineering endeavors in addressing intricate engineering challenges within social and environmental frameworks.	PO7

CO9	Implement ethical principles and adhere to professional standards and norms in this FYDP	PO8
CO10	Capable of operating proficiently both individually and as a team member or leader across diverse teams and interdisciplinary settings in this FYDP.	PO9
CO11	Proficiently communicate with the engineering community and broader society regarding complex engineering endeavors, including the ability to comprehend and generate comprehensive reports and design documentation, as well as provide and receive clear instructions throughout this FYDP.	PO10
CO12	Acknowledge the importance of self-directed and life-long learning within the evolving landscape of technology and possess the readiness and capability to engage in lifelong learning endeavors.	PO12

Addressing CO (1 to 8), Knowledge Profile (K), Attainment of Complex Engineering Problems (EP), and Attainment of Complex Engineering Activities (EA)

Addressing CO (1 to 8), Knowledge Profile (K), Attainment of Complex Engineering Problems (EP):

SN	EP Definition	Attainment	CO	Justification (with Knowledge Profile)	References
1.	EP1: Depth of Knowledge required	Yes	CO1, CO2, CO3, CO5, CO6, CO7 and CO8	Our project needs the proper security information and need proper knowledge about how to organize buttons accordingly K3 and K4.	Page no: [5,16] Section: [1.5,3.3]
				Our project requires the integration of different components. We are attaching the use case and activity diagrams K6 and K7.	Page no: [10.16], Section: [2.4,3.3]

				We have done studied Birkoy, swap Websites in BD	Page no: [8] Section: [2.2]
2.	EP2: Range of Conflicting Requirements	Yes	CO2, and CO7	We have no reference to the specific scrap service, though we found a Facebook group with a similar service and were inspired by it.	Page no: [10] Section: [2.4]
3.	EP3: Depth of analysis required	Yes	CO2, and CO6	Besides many programming languages and frameworks, we chose node.js, react, and express.js for our project because of interactive user interfaces, server-side runtime, handling routing, and middleware.	Page no: [16], Section: [3.3]
4.	EP4: Familiarity of Issues	Yes	CO8	To understand and study the scrap market and business for our project, we needed to investigate various aspects we needed to be more familiar with. Specifically, we must figure out environmental development and sustainability.	Page no: [5], Section: [1.5]

5.	EP5: Extends of application codes	No	CO5	N/A	N/A
6.	EP6: Extends of stakeholders involved and conflicting requirements	No	CO8	We have visited and met with local scrap sellers and environmental experts as part of our project. The purpose is to understand how we can measure scrap management and increase environmental awareness.	Page no: [10] Section: [2.4]
7.	EP7: Interdependence	Yes	CO5	Our project comprises several subsystems that depend on each other. These include recycling or reusing, security, user trust, and developing a front-end and back-end website.	Page no: [16], Section: [3.3]

Addressing CO11 with Complex Engineering Activities (EA) [Some or all of the following]:

SN	EA Definition	Attainment	CO	Justification	References
1.	EA1: Range of resources	Yes	CO11	The development of this system leverages a skilled team across domains, meticulous financial resource allocation for infrastructure, marketing, and development, and utilizes tools like node.js. Visual Studio Code, and various programming languages, frameworks, and databases for effective execution.	Page no: [16], Section: [3.3]
2.	EA2: Level of interaction	No		N/A	N/A
3.	EA3: Innovation	No		N/A	N/A

4.	EA4: Consequences for society and the environment	Yes		Innovative scrap management reduces waste, promotes recycling, and conserves resources, contributing to environmental sustainability. Society benefits through cleaner environments and enhanced awareness of sustainable practices.	Page no: [2], Section: [1.2]
5.	EA-5: Familiarity	Yes		The Comparative Analysis for "Scrapwala" evaluates market competitors like Expedia and bikroy.com to highlight scrapwala unique features, security, personalization, and customer engagement, enriching market understanding and informing strategic decisions for enhanced competitiveness and value proposition.	Page no: [9-10], Section: [2.3]

Addressing CO (4, 9, 10, and 12):

SN	COs	Attainment	Justification	References
1	CO4	Yes	The project captures CO4 by integrating financial management practices, including budgeting, resource allocation, cost management, and risk mitigation, ensuring efficient fund distribution, monitoring expenditures, and identifying optimization areas while maintaining quality.	Page no: [17], Section: [3.4]
2	CO9	Yes	The project upholds ethical practices by prioritizing user privacy, maintaining transparency in data usage, providing fair	Page no: [31], Section:

			suggestions, respecting cultural sensitivities, and promoting accessibility, fostering trust, transparency, and integrity among stakeholders.	[6.3]
3	CO10	No	N/A	N/A
4	CO12	Yes	The project's implementation phase emphasizes lifelong learning through diverse testing protocols, automated frameworks, and CI/CD, ensuring ongoing improvement and adaptation to emerging tech trends, with results analysis refining the platform for enhanced effectiveness.	Page no: [26], Section: [4.3]

ORIGINALITY REPORT

10%
SIMILARITY INDEX

6%
INTERNET SOURCES

0%
PUBLICATIONS

5%
STUDENT PAPERS

PRIMARY SOURCES

1	dspace.daffodilvarsity.edu.bd:8080 Internet Source	5%
2	Submitted to Daffodil International University Student Paper	4%
3	Submitted to North South University Student Paper	<1%
4	isags-unasul.org Internet Source	<1%
5	www.lumiproxy.com Internet Source	<1%
6	123dok.com Internet Source	<1%
7	fastercapital.com Internet Source	<1%

Exclude quotes Off

Exclude matches Off

Exclude bibliography Off