Tribhuvan University

Faculty of Humanities and Social Sciences

Triton International College

SUPERVISOR'S RECOMMENDATION

I hereby recommend that this project prepared under my supervision by **Mr. Mahendra Singh Mahara (Exam Roll No: 52902098)** and **Mr. Bipin Rai (Exam Roll No: 52902093)** entitled "**Scrap Collection system (SCRAP-Z)**" in partial fulfillment of the requirements of BCA-IVth (Project-I) for the degree of Bachelor of Computer Application is recommended for the final evaluation.

…………………

SIGNATURE
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LETTER OF APPROVAL

This is to certify that this project prepared by **Mr. Mahendra Singh Mahara (Exam Roll no: 52902098) and Mr. Bipin Rai (Exam Roll no:52902093)** entitled "**Scrap Collection System (SCRAP-Z)**" in partial fulfillment of the requirements for the degree of BCA IVth (Project-1) has been evaluated. In our opinion it is satisfactory in the scope and quality as a project for the required degree.

SIGNATURE of Supervisor .... Mr. Basanta Chapagain Supervisor Department of BCA Triton International College	**SIGNATURE of HOD/Coordinator** .... Er. Shree Krishna Maharjan Coordinator Department of BCA Triton International College
SIGNATURE of Internal Examiner .... Examiner Department of BCA Tribhuvan University, Nepal	**SIGNATURE of External Examiner** ....

ABSTRACT

This project presents the design and implementation of a web-based scrap collection platform developed as part of the BCA 4th semester academic curriculum. The platform aims to facilitate the sale and collection of scrap items by connecting sellers and buyers (scrap collectors). Sellers can create accounts and list their scrap items for sale as requests on the platform. Buyers can view these requests and choose to accept, decline, or report them. Upon accepting a request, buyers gain access to the seller's contact details, enabling them to arrange for scrap collection directly. Declined requests are removed from the buyer's dashboard, while reported requests are directed to the admin dashboard for review and management. The admin has the authority to review reported requests and monitor user activities to ensure platform integrity and user compliance. This project demonstrates the practical application of web development technologies and provides a valuable solution for efficient scrap collection and recycling.

ACKNOWLEDGEMENT

We would like to express our deepest gratitude to our subject teachers, who have imparted invaluable knowledge and skills in various programming languages, enabling us to undertake and successfully complete this project. Our sincere thanks go to the Head of the BCA Department at Triton College, ER. Shree Krishna Maharjan Sir, for managing all the necessary arrangements and supporting our endeavors.

We are profoundly grateful to our supervisor and subject teacher, Basanta Chapagain, for his continuous guidance, encouragement, and supervision throughout the project creation process. His expertise and insights were instrumental in shaping our work.

Additionally, we extend our heartfelt thanks to our friends for their unwavering support and assistance during the project. Their collaboration and encouragement were vital to our success.

Lastly, we acknowledge the numerous online and offline educational resources that contributed significantly to our understanding and development of this project. These resources provided us with essential knowledge and tools, facilitating our progress and enhancing the quality of our work.

Mahendra Singh Mahara

52902098

Bipin Rai

52902093

Date: 2081-01-1

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CSS: Cascading Stylesheet

DFD: Data Flow Diagram

ER: Entity Relationship

HTML: Hyper Text Markup Language

JS: Java-Script

OS: Operating System

PHP: Hyper Text Preprocessor

RAM: Random Access Memory

SQL: Structured Query Language

ST-[Unique Identifier]: System Test with Unique Identifier of Modules

TC-AMM: Test cases for Administrative Management Module

TC-DMM: Test cases for Draft Management Module

TC-RMM: Test cases for Request Management Module

TC-RPM: Test cases for Report Management Module

TC-SMM: Test cases for Statistics Management Module

TC-TMM: Test cases for Transaction Management Module

TC-UMM: Test cases for User Management Module

UI: User Interface

VS: Visual Studio

XAMPP: Local server for X-operating system, Apache, MySQL, PHP, Perl

Chapter 1: Introduction

1.1 Introduction

"Scrap-Z" web application is a revolutionary initiative aimed at streamlining and enhancing the process of scrap material collection. Recognizing the growing importance of sustainable waste management, Scrap-Z serves as a digital platform connecting scrap collectors with individuals seeking to responsibly dispose of their scrap materials. This innovative solution addresses the need for an efficient and organized system to facilitate the collection and recycling of scrap, contributing significantly to environmental sustainability.

The web application offers a user-friendly interface that allows individuals to easily list or schedule and request scrap collection services. By simplifying the process for users to dispose of their scrap, Scrap-Z promotes responsible waste management practices. Simultaneously, the platform enables scrap collectors to access and respond to collection requests, creating a seamless and efficient connection between the two parties.

1.2 Statement of Problem

In today's market, several existing platforms allow users to list their scrap materials for sale. However, these platforms are often limited in their approach, as they typically rely on a closed system where only the platform's agent buyers are aware of the listed scrap. This creates a significant barrier for independent buyers who are not connected with these platforms, preventing them from accessing and purchasing the listed scrap materials.

This restricted access results in a lack of competition, which can lead to lower prices for sellers and reduced opportunities for buyers who are not part of the platform's network. Furthermore, the absence of a comprehensive system to connect individual buyers with sellers limits the efficiency and reach of scrap material transactions. Consequently, the current platforms do not fully address the needs of all stakeholders in the scrap material market. Which resulting in missed economic opportunities for small businesses and both parties.

1.3 Objectives

- **To connect scrap collectors and households**: Facilitate a seamless connection between scrap collectors and individual sellers, bridging the gap that traditional methods and existing platforms fail to address.
- **To increase collection area through digital integration**: Expand the reach of scrap collectors by integrating a digital platform that allows for broader and more efficient coverage of scrap collection areas.
- **To reduce time and costs for scrap collectors and sellers**: Streamline the scrap collection process, minimizing the time and expenses involved for both collectors and sellers through an efficient digital solution.

1.4 Project Scope and Limitations

The scope of the Scrap-Z web application encompasses the following aspects:

1.4.1 Scope of the System

The Scrap-Z platform was designed with a clear set of objectives to streamline the process of scrap collection and disposal. The scope of the system includes the following functionalities:

- **Individual Participation**: Allow individuals to create accounts, list their scrap materials, and manage their listings.
- **Connect Buyers and Sellers Directly:** Facilitate direct interactions between buyers and sellers for scrap collection and disposal.
- **Time and Cost Savings:** Save time and reduce costs for both buyers and sellers by providing a centralized platform for scrap transactions.
- **Expanded Collection Area:** Increase the collection area for scrap collectors, allowing them to access a broader market.
- **Versatile Scrap Handling:** Option for handle or sell any type of day-to-day produced scrap items, providing a platform for various scrap materials.
- **Market Expansion**: Increase economic opportunities for small businesses and independent collectors by connecting them with a wider range of sellers.
- **Platform Accessibility**: The platform is easy to navigate for both sellers and buyers, promoting widespread use and adoption.

1.4.2 Limitations of the System

Despite its good features and user-friendly design, the Scrap-Z platform has several limitations that impact its functionality and user experience:

- **No Mobile Application:** The platform currently lacks a dedicated mobile application, limiting access to desktop browsers only.
- **Absence of Real-Time Communication:** There is no real-time chat feature, which could facilitate instant communication between users.
- **Restricted Access for Unregistered Users:** Only registered users can view and create scrap collection requests, which may limit the reach of the platform.
- **No Integrated Payment Processing:** The platform does not support integrated payment processing, requiring users to handle payments externally.
- **Payment Features Not Implemented:** There is no transection or payment feature implemented for now so users may use the external ways to do payment transection between buyers and sellers.

These limitations present opportunities for future enhancements to improve the functionality and user experience of the Scrap-Z platform.

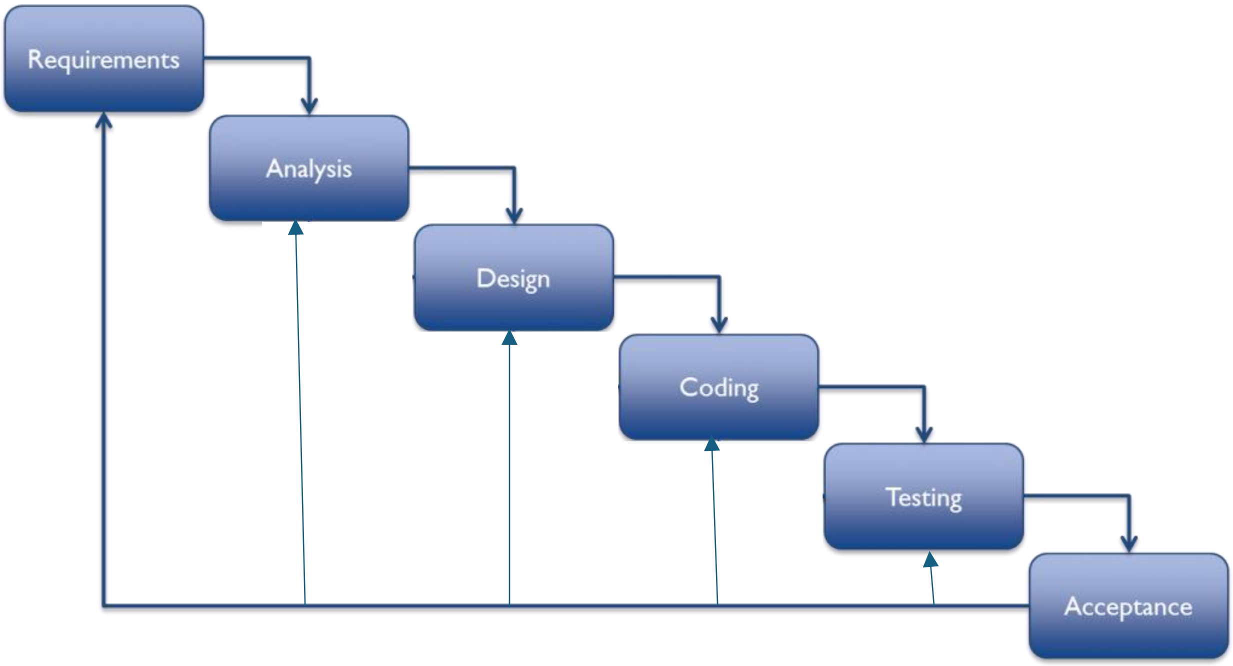
1.5 Development Methodology

The “Scrap-Z” system was developed using the Waterfall methodology. This methodology divides the software development process into sequential phases, with each phase serving as a foundation for the next. The Waterfall methodology follows a linear and structured approach, where progress flows steadily through these distinct phases:

1. **Planning**: In the planning phase, the project's objectives, scope, and feasibility were defined. Detailed project schedules and resource allocations were established to ensure a clear roadmap for development.
2. **Analysis**: During the analysis phase, the requirements for the system were gathered and thoroughly analyzed. This involved understanding the needs of both sellers and buyers, and documenting functional and non-functional requirements.
3. **System Design**: The system design phase was divided into two parts—logical and physical design. The logical design focused on the conceptual framework of the system, including data models and process flows. The physical design translated

these concepts into specific technologies and architectures, detailing the hardware and software specifications needed to implement the system.

4. **Implementation**: In the implementation phase, the system was built according to the design specifications. This involved coding the application, integrating various components, and setting up the necessary infrastructure to support the platform.
5. **Testing**: Rigorous testing was conducted to identify and resolve any issues or bugs. This phase ensured that the system met all the specified requirements and functioned correctly under different conditions.
6. **Deployment**: Finally, in the deployment phase, the Scrap-Z system was released for use. This phase included the installation of the system in the production environment, user training, and initial support to address any post-release issues.



[Waterfall Software Development] (https://alliedcode.com/images/blog/waterfall-software-development.jpg)

Accessed: January 29, 2024

Figure 1.1: Waterfall Methodology

By following the Waterfall methodology, Scrap-Z was developed systematically, ensuring clear objectives, thorough requirements analysis, robust system design, rigorous testing, and successful deployment. This structured approach helped in delivering a reliable and user-friendly platform for connecting scrap buyers and sellers, fostering sustainability through efficient scrap material exchange.

1.6 Report Organization

This report is organized into five chapters:

- **Chapter 1: “Introduction”** – This chapter introduces the problem statement, objectives, development methodology, and the scope of the project.
- **Chapter 2: “Background Study and Literature Review”** – This chapter describes the background of the study and reviews the existing literature relevant to the project.
- **Chapter 3: “System Design”** – This chapter covers the functional and non-functional requirements, as well as the system feasibility.
- **Chapter 4: “Implementation and Testing”** – This chapter illustrates the methods and tools used to implement the project, along with the testing processes.
- **Chapter 5: “Conclusion and Future Works”** – The concluding chapter summarizes the successful completion of the project and discusses future endeavors and plans for its expansion.

Chapter 2: Background Study and Literature Review

2.1 Background Study:

The management and disposal of scrap materials have long been significant challenges in both urban and rural areas.

Traditionally, scrap collection involves individual collectors visiting homes and businesses, inquiring about scrap materials available for sale. This conventional method is time-consuming and often inefficient. This method misses economic opportunities for small businesses and households. The reviewed platforms do not offer an inclusive method for connecting individual buyers with sellers, focusing instead on larger entities and transactions.

With the increasing emphasis on sustainable waste management, there is a growing need for more organized and efficient systems to handle scrap materials. Current market platforms that facilitate scrap transactions often focus on large-scale operations, connecting only a limited group of buyers and sellers. These platforms typically cater to industrial needs and exclude smaller, individual transactions. This creates a gap in the market for a solution that can serve a broader audience, including independent buyers and individual sellers.

Existing platforms in India and Nepal cater predominantly to large-scale buyers and organized groups, neglecting the needs of individual sellers and buyers. This creates a barrier to a truly competitive and efficient marketplace. Scrap-Z aims to address these gaps by providing a comprehensive and accessible solution that connects individual sellers with a diverse range of buyers, enhancing the efficiency and inclusivity of the scrap material market.

Recognizing these issues, the development of a comprehensive digital platform like Scrap-Z becomes crucial. Scrap-Z aims to bridge the gap by creating an inclusive, user-friendly web application that connects individual sellers with a wide range of buyers, enhancing market transparency and competition. This platform not only promotes sustainable waste management practices but also supports small businesses and independent collectors by expanding their access to the market.

By integrating technology into the scrap collection process, Scrap-Z seeks to revolutionize the industry, making it more efficient, transparent, and accessible to all stakeholders. This study explores the development and implementation of such a platform, addressing the existing challenges and providing a sustainable solution for the future.

2.2 Literature Review

The recycling cycle, particularly in the steel industry, has seen a significant increase in the use of recycled scrap, largely driven by the availability of cheap automotive scrap. The efficiency of scrap collection significantly influences the amount and quality of recovered metal. Traditional manual scrap collection methods, although common, are labor-intensive and time-consuming. In contrast, automated solutions, such as robotic scrap collection, offer enhanced accuracy and efficiency, reducing the need for manual labor and expediting the collection process [1].

Despite existing e-waste management legislation in many countries, the management of these wastes remains inadequate. Globally, the scrap market supplies 40% of the ferrous material used in steelmaking, with prices set in the USA and influenced by dockside trading. Market behavior is characterized by episodic price fluctuations and seasonal variations, with no long-term correlation between scrap prices and energy prices [2].

In developing Scrap-Z, an analysis of existing Indian and Nepali scrap collection platforms was conducted to identify service gaps. These platforms include The Kabadiwala [3], ScrapUncle [4], ScrapVala [5], and Safai Mitra [6] in India, and Khaali Sisi [7] in Nepal. While these platforms provide digital solutions for scrap collection, they primarily focus on large-scale transactions, serving industries or organized groups. The closed systems of these platforms restrict access to listed scrap materials to only the platform's agents, thereby limiting competition and opportunities for independent buyers and small-scale sellers.

Chapter 3: System Analysis and Design

3.1 System Analysis

The system analysis of the system is done by conducting requirement analysis, feasibility analysis, data modeling and process modeling as follows:

3.1.1 Requirement Analysis

The requirement analysis phase was crucial in the development of the Scrap-Z platform, as it helped identify and document the necessary features and functionalities that the system needed to meet the users' needs. This phase involved gathering detailed information about what the system should do (functional requirements) and the constraints under which it must operate (non-functional requirements). Understanding these requirements ensured that the final product aligned with user expectations and performed effectively within its intended environment.

3.1.1.1 Functional Requirements

Functional requirements specified what the system should do and the specific behaviors or functions it needed to support. For Scrap-Z, these requirements included:

1. **User Registration and Authentication**:
   - The system allowed users (sellers and buyers) to create accounts.
   - The system provided login and authentication features to ensure secure access.
2. **Scrap Listing Management**:
   - Sellers were able to create, edit, and delete scrap listings.
   - Listings included details such as type of scrap, quantity, and location.
3. **Request Handling**:
   - Buyers were able to view and accept, decline, or report scrap listings.
   - Accepted requests provided buyers with the seller's contact details for direct communication.
4. **Admin Management**:
   - Admins were able to review and manage reported listings.
   - Admins had the ability to view and delete user profiles and listings.

5. **Notification System**:
   - The system notified users of relevant actions, such as acceptance of a request or reporting of a listing.
6. **Category and Filter**:
   - Users or buyers can view categorized and filtered scrap listings based on various criteria (e.g., type of scrap, location).

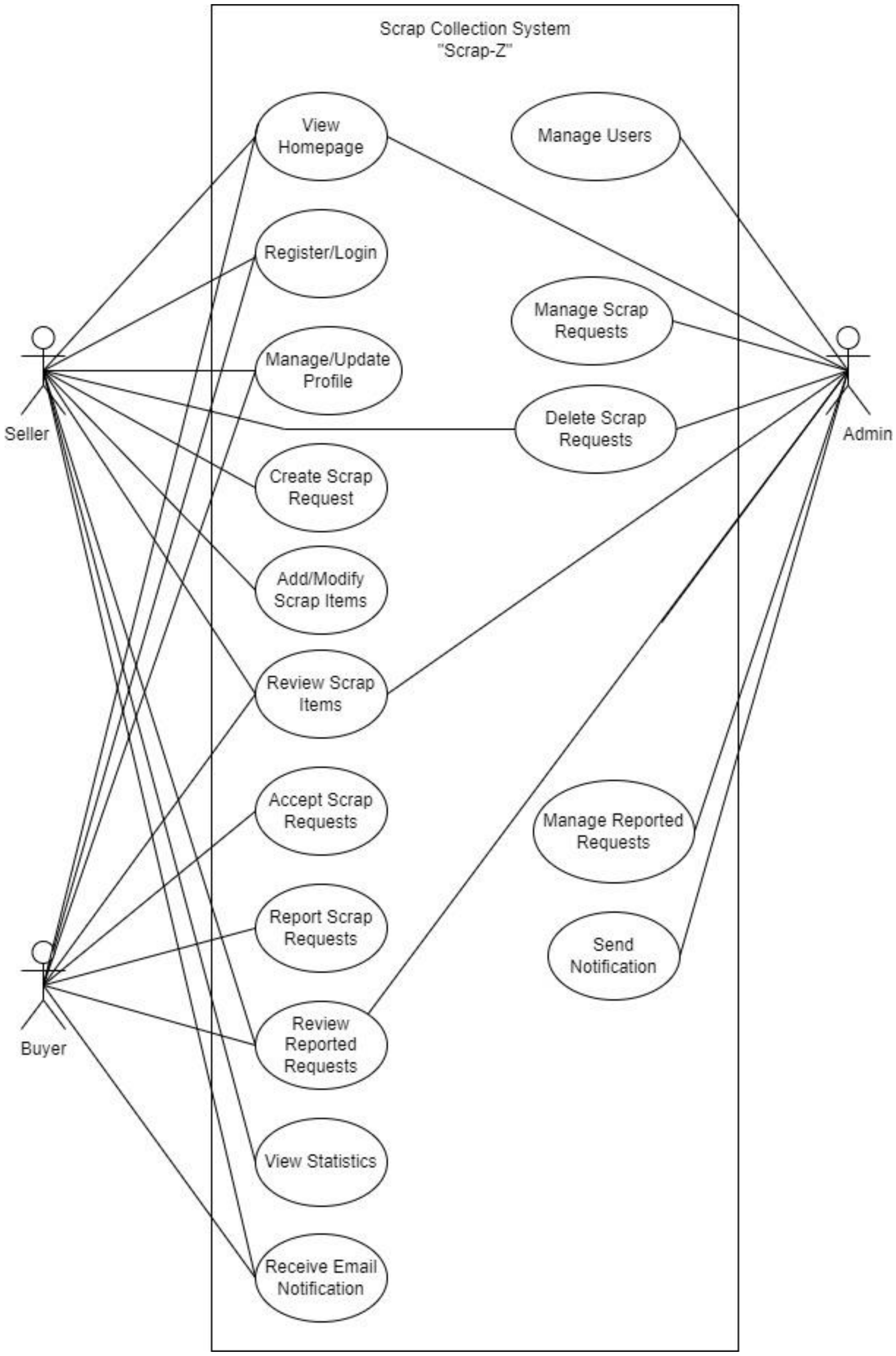


Figure 3.1 Use Case Diagram of Scrap-Z Project

3.1.1.2 Non-Functional Requirements

Non-functional requirements defined the system's quality attributes, including performance, usability, reliability, and security. For Scrap-Z, these requirements included:

1. **Performance**:

   - The system handled multiple user requests efficiently without significant delays.
   - The platform supported a large number of concurrent users.

2. **Usability**:

   - The user interface was intuitive and easy to navigate for both sellers and buyers.
   - The platform provided clear instructions and feedback to users during interactions.
   - The system shall require a localhost server, database server and a web browser to run successfully.

3. **Reliability**:

   - The platform reliably presented accurate and up-to-date scrap listings, allowing buyers to trust the information provided and make informed decisions.
   - Data integrity was maintained, ensuring that user data and listings were not lost or corrupted.

4. **Security**:

   - User data was protected through encryption and secure authentication methods.
   - The system had measures in place to prevent unauthorized access and data breaches.
   - The user password shall be in encrypted format in the database.
   - Every user shall have a unique Session while logging into the system.

5. **Scalability**:

- The platform was designed to scale with an increasing number of users and listings.
- It supported future enhancements and additional features without requiring major redesigns.

6. **Maintainability**:

- The system was easy to maintain, with clear documentation and modular design.
- Admins were able to manage and update the platform with minimal effort.

By clearly defining these functional and non-functional requirements, the Scrap-Z platform aimed to deliver a robust, efficient, and user-friendly solution for connecting scrap buyers and sellers, promoting sustainable waste management, and enhancing market transparency.

3.1.2 Feasibility Study

The feasibility study for the Scrap-Z project was conducted to determine the practicality and viability of developing the platform. This involved analyzing various aspects, including technical, economic, operational, and schedule feasibility, to ensure the project could be successfully implemented within the given constraints and resources.

3.1.2.1 Technical Feasibility

The technical feasibility of the Scrap-Z web application was favorable. The project was developed using languages such as HTML5, CSS3, JavaScript, and PHP, along with tools like PHP Composer, Leaflet-Map CDN, Font-Awesome CDN, Google Fonts, and AJAX. Since all these technologies could run on modern systems and devices that support web browsers, the project was considered technically feasible. To develop this platform, we don’t need high performance or premium hardware and software. Code editor such as VS code and devices browser easily capable to handle our platform. Based on these considerations, it was determined that the technical resources available were sufficient to develop the Scrap-Z platform effectively.

3.1.2.2 Operational Feasibility

From an operational standpoint, Scrap-Z was feasible as it addressed existing challenges in the scrap collection process. The system's user-friendly interface enhanced accessibility for both scrap collectors and individuals, reducing the learning curve and ensuring effortless operation without extensive training or technical expertise. By adopting a design similar to popular social media platforms, users are more likely to find the interface intuitive and easy to navigate. This familiarity reduces the learning curve and enhances user adoption. The platform used plain programming languages without frameworks or libraries, avoiding confusion and ensuring understanding. Most users were able to become proficient within minutes, significantly reducing training time and costs.

3.1.2.3 Economic Feasibility

The economic feasibility of the Scrap-Z project was also favorable. As a college project, most resources used were free, and the required costs were manageable. The initial development costs were low, and the potential benefits outweighed the investment. The system's mostly used components are provided by open-source technologies, which are free. and by running on local machines and utilizing a lightweight design, the project minimized resource requirements, reducing ongoing maintenance and licensing fees.

3.1.2.4 Schedule Feasibility

The schedule feasibility of Scrap-Z was reasonable, considering the defined project scope and well-structured development plan. Key milestones, such as system design, implementation, testing, and deployment, were outlined with realistic timelines. Regular progress assessments and feedback loops were implemented to ensure that the project stayed on track. We highly committed to meeting with the project supervisor to ensure the completion of the project within the specified deadlines. Given the low requirements for this project and the employment of the Waterfall model, the project was confidently completed within the specified timeframe.

GANTT CHART / PROJECT PLAN										
ID	TITLE	Magh			Falgun			Chaitra		
		1-10	11-20	21-29	1-10	11-20	21-30	1-10	11-20	21-30
1	Analysis	🟦								
2	Design		🟩	🟩						
3	Implementation				🟪	🟪	🟪	🟪		
4	Testing								⬛	
5	Documentation	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨
6	Review									🟥

Figure 3.2: Gantt Chart of Scrap-Z Project

3.1.3 Data Modeling (ER Diagram):

Data modeling for the Scrap-Z platform involved designing a structured and organized schema to manage the information related to users, requests, transactions, and administrative actions. The database schema was implemented using SQL, with multiple tables to ensure data integrity, normalization, and efficient access. Below is an overview of the data modeling approach used for Scrap-Z, including the Entity-Relationship (ER) diagram. The ER diagram visually represents the relationships between different entities in the Scrap-Z database. Each entity corresponds to a table, and the relationships indicate how the tables interact with each other. The ER diagram for Scrap-Z includes the following entities:

1. **Admins**
2. **Users**
3. **UserContacts**
4. **Requests**
5. **ScrapItems**
6. **Transactions**
7. **RequestReports**

8. **AdminActions**
9. **UserActivities**

The relationships between these entities are established through foreign keys, ensuring referential integrity.

Below is the ER diagram for the Scrap-Z database:

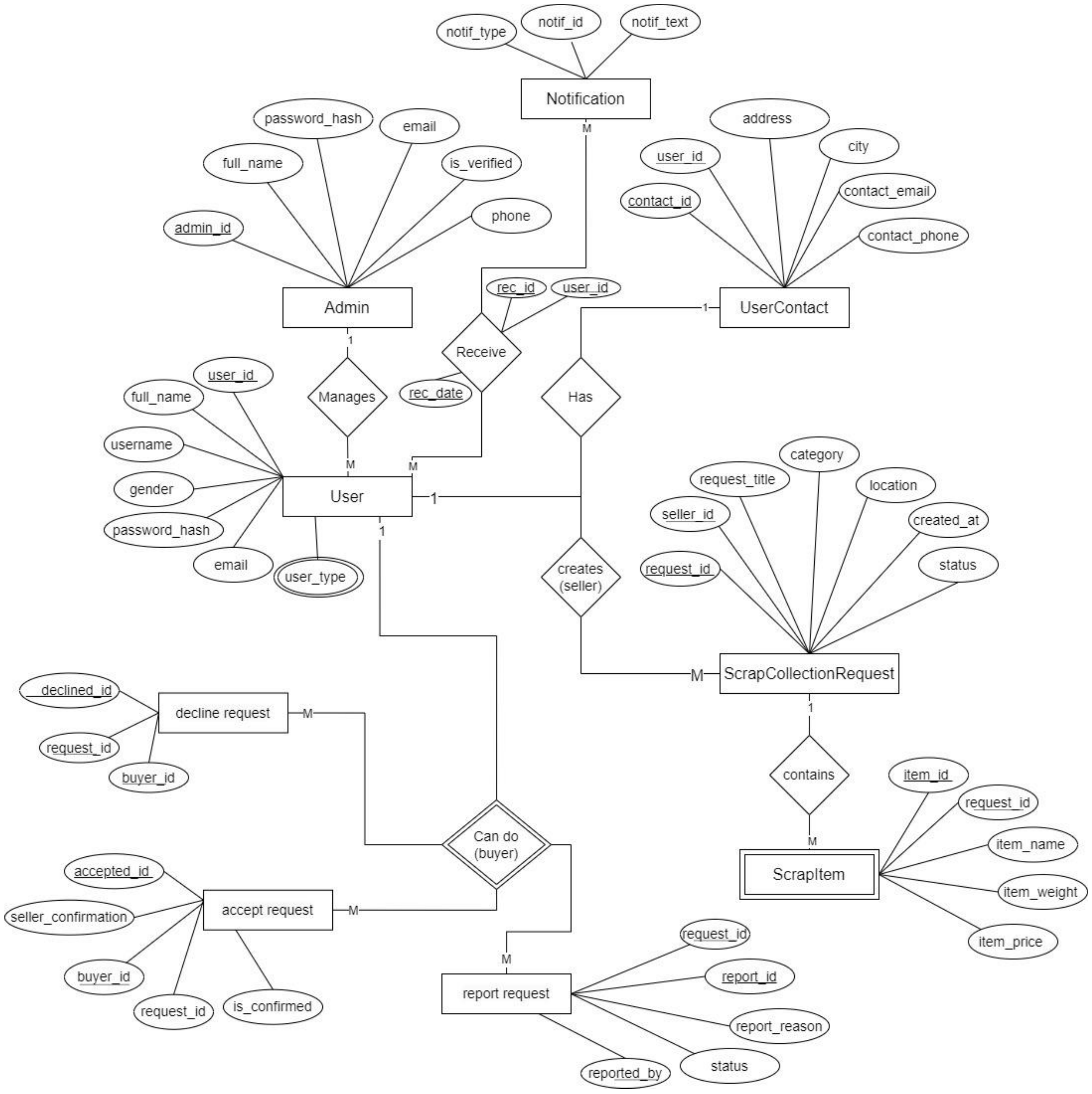


Figure 3.3: ER Diagram of Scrap-Z Project

The data modeling process for Scrap-Z involved designing a comprehensive and efficient database schema to manage the platform's data. The use of relational tables and foreign keys ensured data integrity and facilitated easy access to information. The ER diagram provided a clear visualization of the relationships between different entities, which guided the implementation of the database schema. This structured approach enabled the successful implementation and deployment of the Scrap-Z platform, meeting the requirements of users and administrators effectively.

3.1.4 Process Modeling (DFD)

Process modeling for the Scrap-Z platform was conducted to visualize and understand the flow of information and interactions within the system. The primary tool used for this purpose was the Data Flow Diagram (DFD), which illustrates how data moves through the system, the processes that transform the data, and the external entities that interact with the system. Additionally, a context diagram was created to provide a high-level overview of the system's interactions with external entities.

3.1.4.1 Level 0 DFD or Context Diagram:

The context diagram provides a high-level view of the Scrap-Z system, showing its interactions with external entities such as sellers, buyers, and administrators.

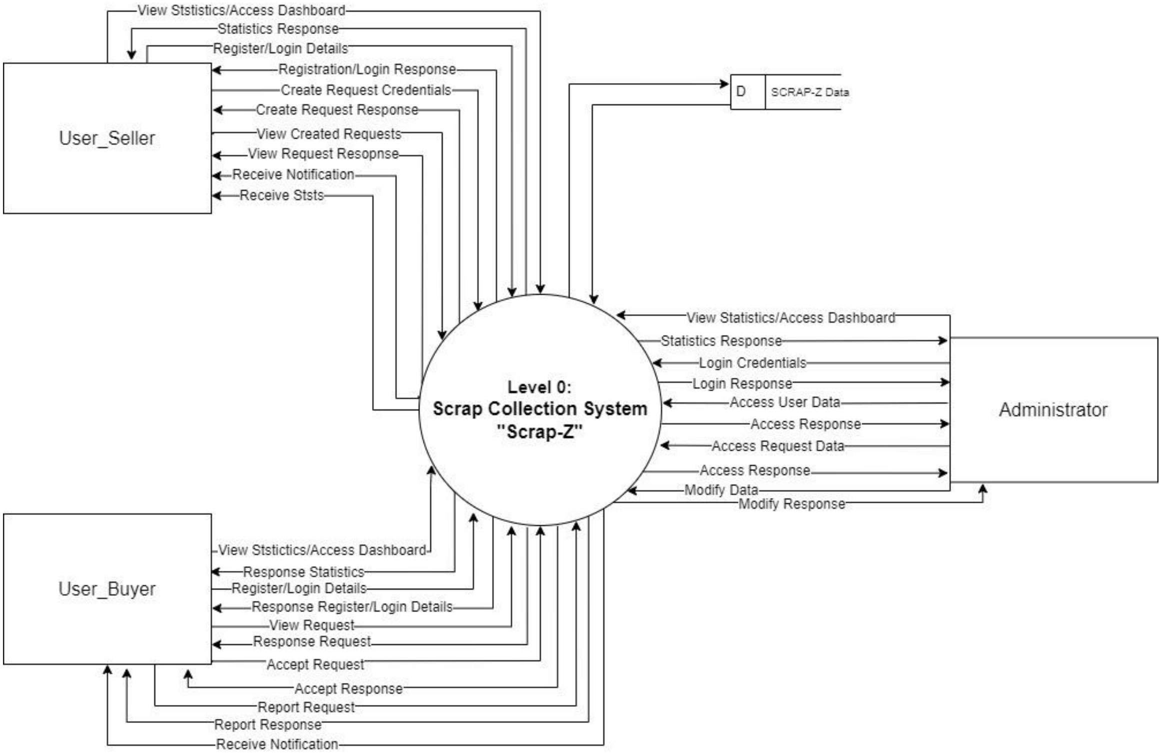


Figure 3.4: Context or Level 0 DFD of Scrap-Z Project

3.1.4.2 Level 1 DFD:

The Level 1 DFD for Scrap-Z shows the main processes and data stores involved in the system.

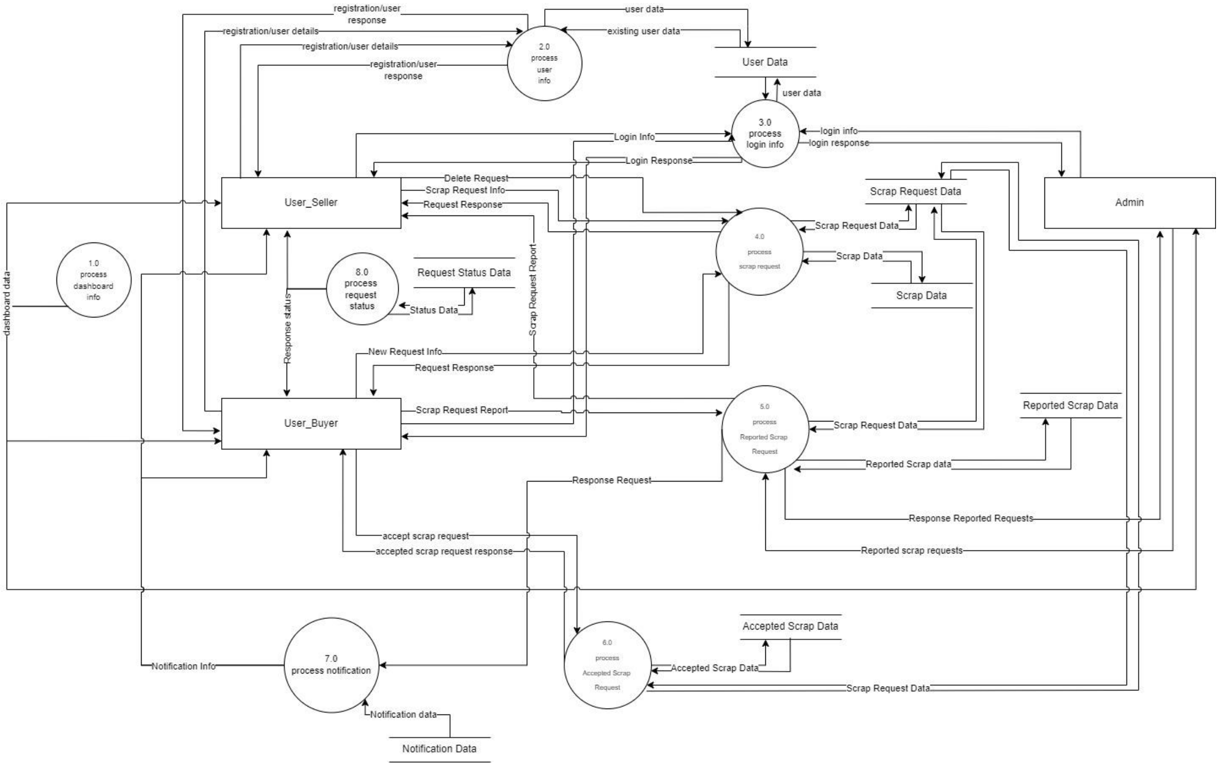


Figure 3.5: Level 1 DFD of Scrap-Z Project

The process modeling of Scrap-Z involved creating a context diagram and detailed Data Flow Diagrams (DFDs) to represent the system's interactions and data flow. These diagrams provided a clear and structured visualization of how data moves through the system, the processes that handle the data, and the interactions between different entities. This modeling approach ensured a comprehensive understanding of the system's functionality and facilitated effective development and implementation.

3.2 System Design

3.2.1 High Level Design

The high-level design of Scrap-Z outlines the major components and their interactions within the system, providing a comprehensive overview of the system architecture. This design phase was crucial in ensuring a robust and scalable solution for the scrap collection platform. The High-level System Flow Chart is given below:

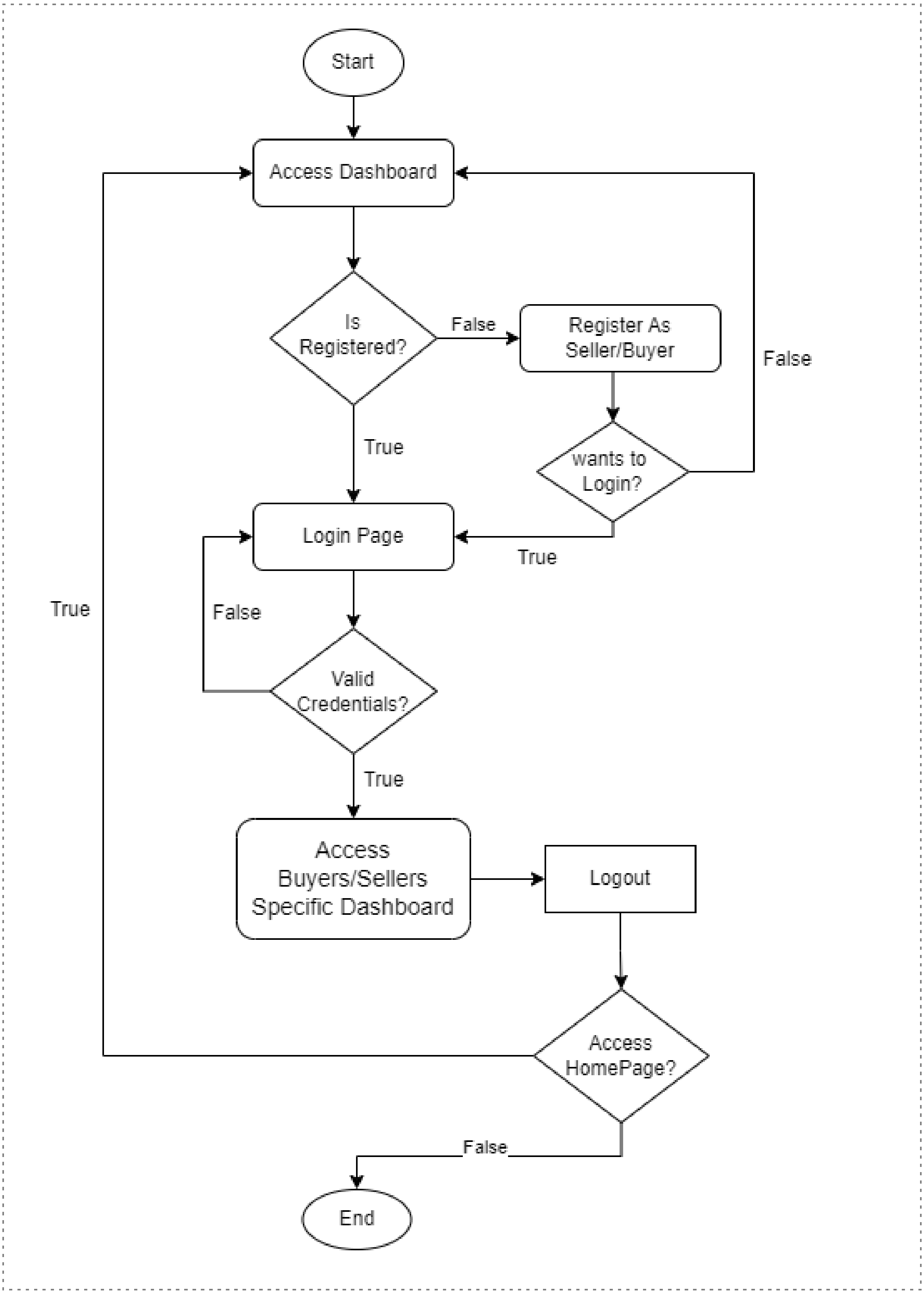


Figure 3.6: High Level System Flow Chart of Scrap-Z Project

3.2.2 Architectural Design

The architectural design of the Scrap-Z platform follows a three-tier architecture comprising the Presentation Tier, Logic Tier, and Data Tier.

- **Presentation Tier**: This tier is responsible for interacting with the user through the web interface. It is developed using HTML5, CSS3, JavaScript, Leaflet-Map CDN, Font-Awesome CDN, and Google Fonts.
- **Logic Tier**: This tier contains the core application logic and processes requests from the Presentation Tier. It is implemented using PHP and PHP Composer.
- **Data Tier**: This tier manages the database and handles data storage and retrieval. It uses MySQL as the database management system.

The architecture ensures separation of concerns, enabling easier maintenance, scalability, and enhanced security.

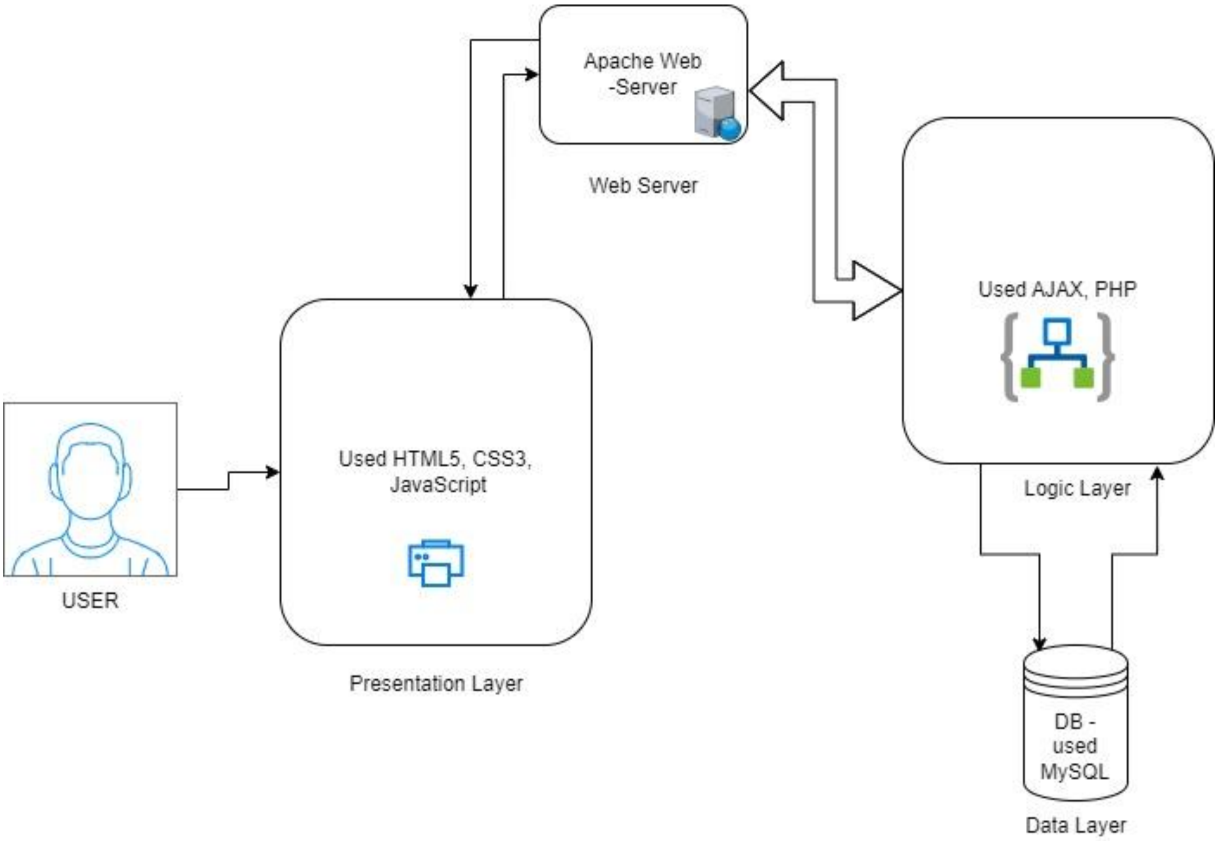


Figure 3.7: Architectural Design of Scrap-Z Project

3.2.3 Database Schema Design

The database schema design for the Scrap-Z platform involves defining the structure of the database, including the tables, fields, and relationships between them. The schema ensures that all necessary data is stored efficiently and can be retrieved and manipulated as needed. The database schema of Scrap-Z is given below:

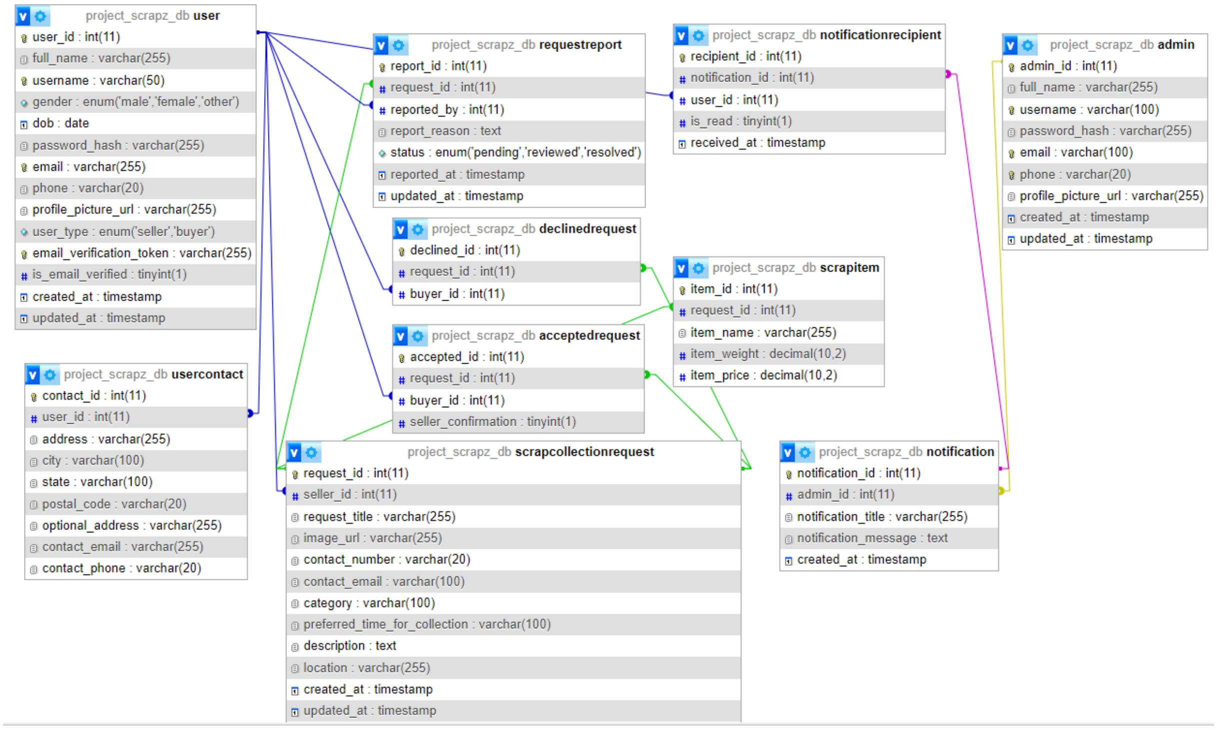


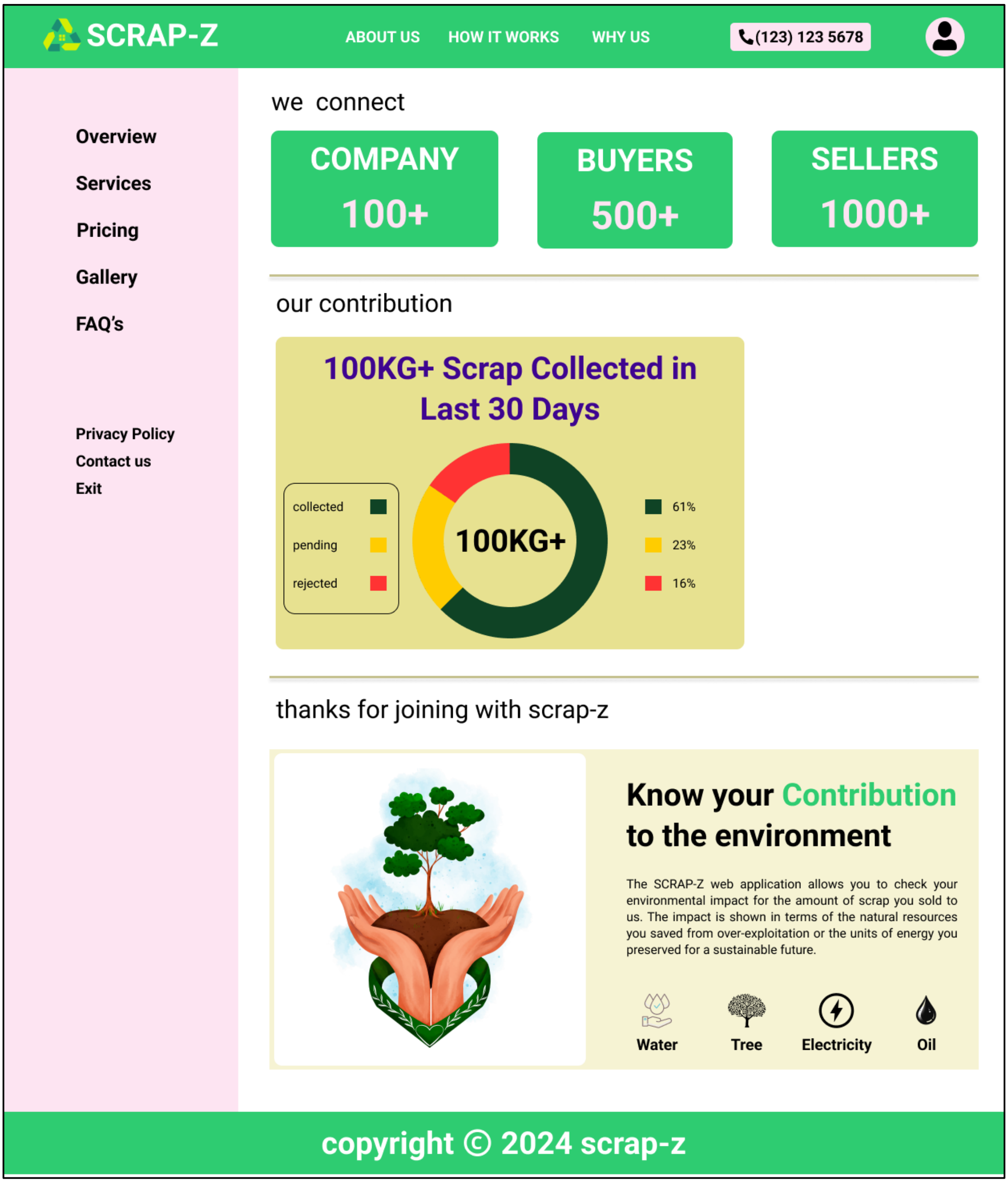
Figure 3.8: Database Schema of Scrap-Z Project

3.2.4 Interface Design (UI Interface / Interface Structure Diagrams)

The user interface design focuses on simplicity and usability, ensuring that users can easily navigate and perform necessary actions. The primary interfaces include:

- **Registration and Login Pages**: Users can register and log in to their accounts.
- **Dashboard**: Users can view and manage their scrap requests.
- **Request Creation Page**: Sellers can create new scrap requests.
- **Request Viewing Page**: Buyers can view available scrap requests.
- **Admin Dashboard**: Admins can manage user profiles, requests, and reports.

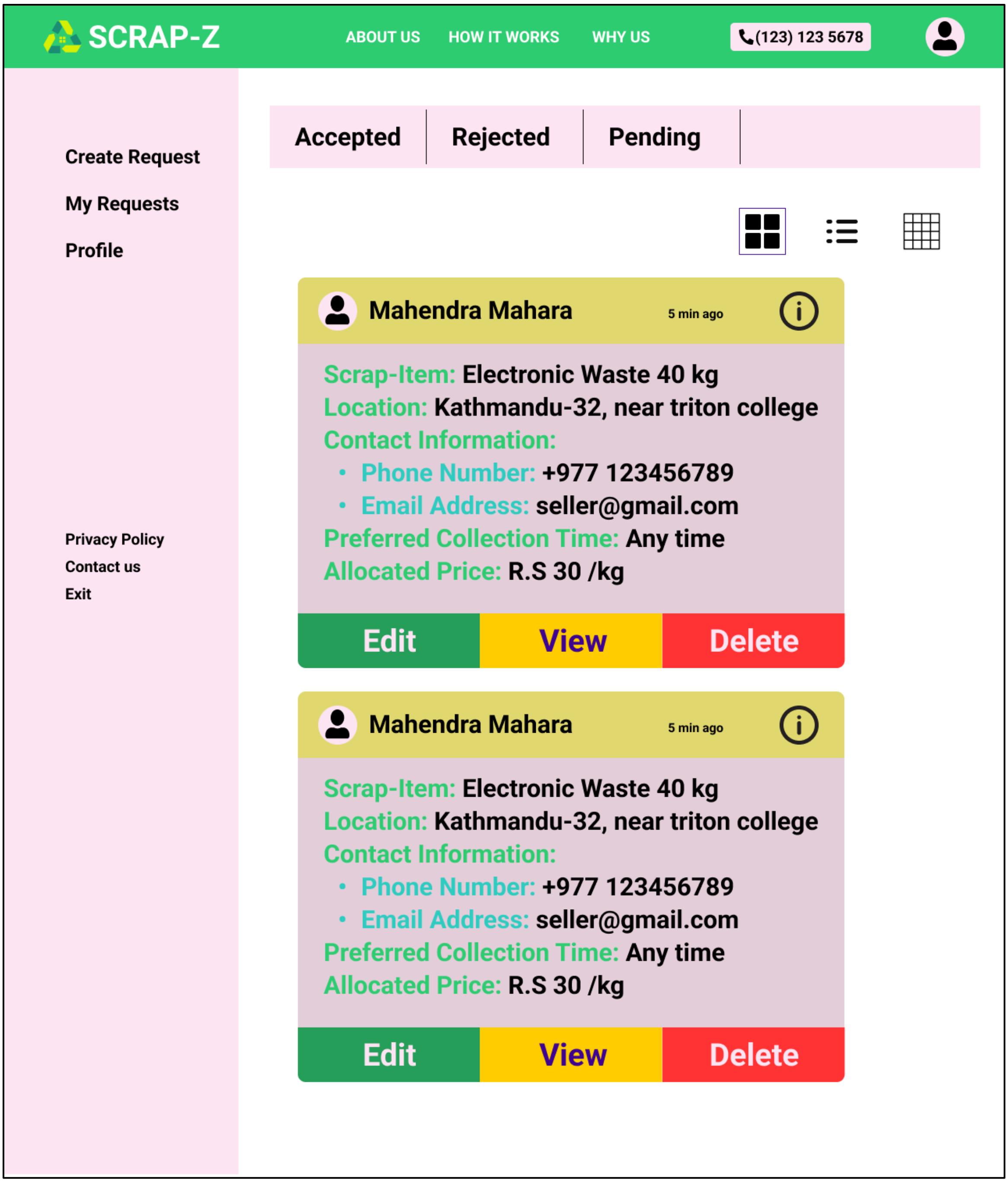
The interface design was implemented using HTML5, CSS3, JavaScript, and AJAX to provide a dynamic and responsive user experience.



Know your Contribution to the environment

The SCRAP-Z web application allows you to check your environmental impact for the amount of scrap you sold to us. The impact is shown in terms of the natural resources you saved from over-exploitation or the units of energy you preserved for a sustainable future.

Figure 3.9: Dashboard Page of Scrap-Z Project using Figma



Mahendra Mahara 5 min ago

Scrap-Item: Electronic Waste 40 kg
Location: Kathmandu-32, near triton college
Contact Information:

- Phone Number: +977 123456789
- Email Address: seller@gmail.com

Preferred Collection Time: Any time
Allocated Price: R.S 30 /kg

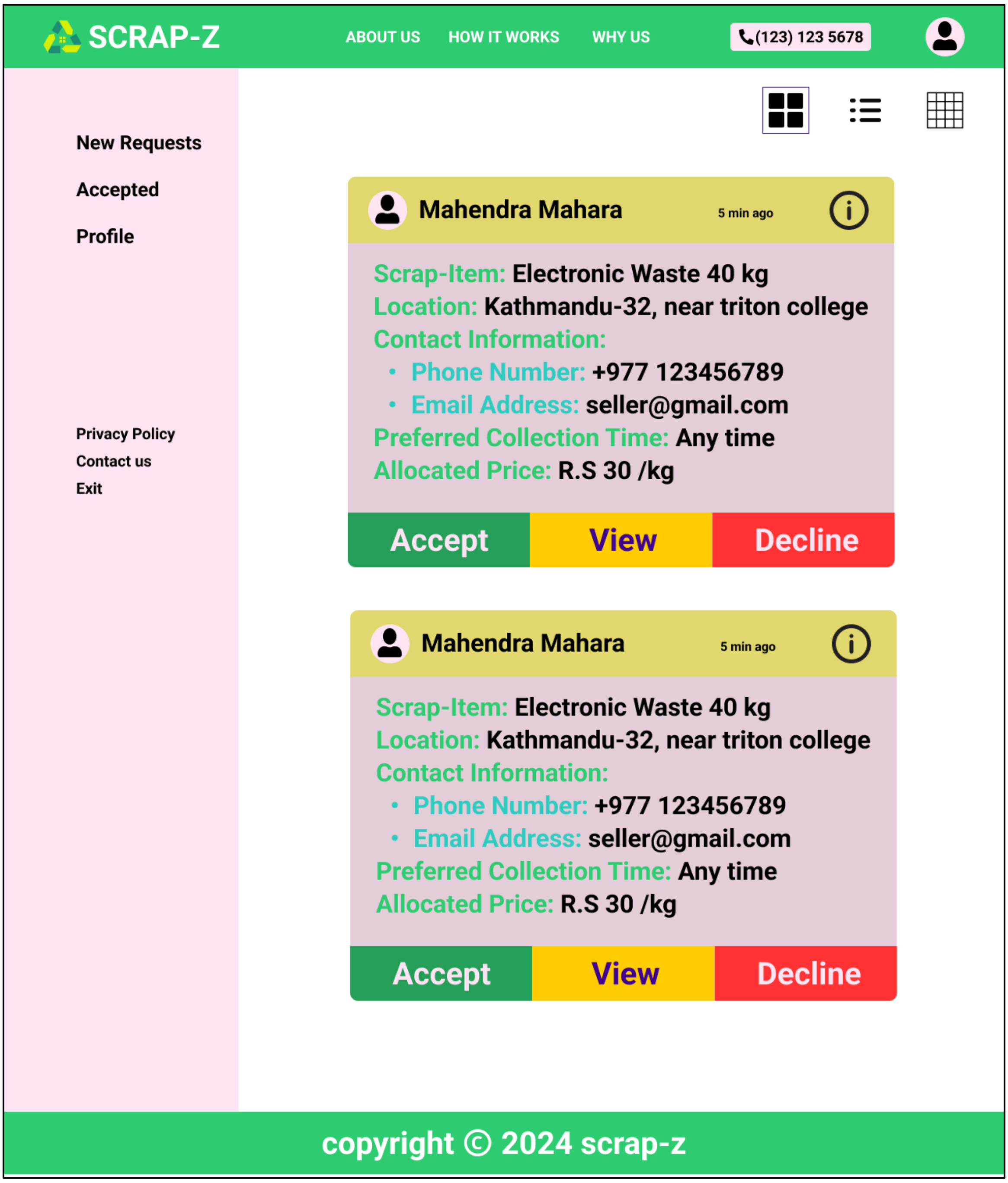
Mahendra Mahara 5 min ago

Scrap-Item: Electronic Waste 40 kg
Location: Kathmandu-32, near triton college
Contact Information:

- Phone Number: +977 123456789
- Email Address: seller@gmail.com

Preferred Collection Time: Any time
Allocated Price: R.S 30 /kg

Figure 3.10: Seller Dashboard Page of Scrap-Z Project using Figma.



Mahendra Mahara 5 min ago

Scrap-Item: Electronic Waste 40 kg
Location: Kathmandu-32, near triton college
Contact Information:

- Phone Number: +977 123456789
- Email Address: seller@gmail.com

Preferred Collection Time: Any time
Allocated Price: R.S 30 /kg

Mahendra Mahara 5 min ago

Scrap-Item: Electronic Waste 40 kg
Location: Kathmandu-32, near triton college
Contact Information:

- Phone Number: +977 123456789
- Email Address: seller@gmail.com

Preferred Collection Time: Any time
Allocated Price: R.S 30 /kg

Figure 3.11: Buyer Dashboard Page of Scrap-Z Project using Figma.

Chapter 4: Implementation and Testing

4.1 Implementation

In this stage, physical system specifications are converted into working and reliable solution. This is a stage where the system is developed. On the receiving the system design documents, the work is divided in modules/units and actual coding is started. It is flowed by testing. Several tools are used in this phase if software development.

4.1.1 Tools Used

The development of the Scrap-Z platform utilized various tools and technologies to ensure a robust, scalable, and user-friendly system. Below is a list of the primary tools and technologies used:

1. **CASE Tools**:

Table 4.1: Case Tools Used for Scrap-Z Platform Development

Tools	Purposes
Figma	For UI/UX design and prototyping.
Draw.io, Visual Paradigm	For system design and modeling.

2. **Development Tools:**

Table 4.2: Development Tools Used for Scrap-Z Platform Development

Tools	Purposes
phpMyAdmin	For database management and SQL query execution.
GitHub	For version control and collaboration.
Visual Studio Code (VS-Code), Sublime Text	For coding, compile and debugging the application.
Chrome Browser, Microsoft Edge	For testing and debugging the web application.

XAMPP	For creating a local web server to test the application in a development environment.

3. **Programming Languages**:

Table 4.3: Programming Language Used for Scrap-Z Platform Development

Language	Purposes
HTML5	For Framing of the application and structuring web content.
CSS3	For styling or designing web pages.
JavaScript	For add dynamic content and interactivity or Client-side Functionality of the application.
PHP	For server-side scripting and backend logic.
AJAX	For asynchronous web requests, data transfer and server interaction through client side.

4. **Database Platforms:**

Table 4.4: Data Storage Used for Scrap-Z Platform Development

Database Tools and Languages	Purposes
MySQL, MariaDB	For storing and managing data related to users, listings, and transactions.
Local Storage	For saving draft scrap requests on the client-side for persistence across sessions.
Indexed-DB	For storing larger and more complex draft requests on the client-side, providing a more robust storage solution than LocalStorage.

Session, Cookies	For maintaining user sessions and storing temporary data such as user preferences and login status.

5. **Other Tools**

Table 4.5: Other Tools Used for Scrap-Z Platform Development

Tools	**Purposes**
Leaflet-Map CDN	For integrating interactive maps to display/choose locations of scrap items collection.
Google Fonts CDN	For enhancing the visual appeal with custom fonts.
Font-Awesome Icons CDN	For adding scalable vector icons and social logos to the user interface.

4.1.2 Implementation Details of Modules

The implementation of Scrap-Z involved the development of several key modules, each handling specific functionalities. Below are the descriptions of these modules and their key procedures/functions:

1. **User Management Module:**
   - **Register User:** Handles user registration by validating input data and storing user information in the database.
   - **Login User:** Authenticates users by verifying credentials against the stored data.
   - **Update User Profile:** Allows users to update their profile information.
   - **Delete User Profile:** Deletes user profiles and associated data from the system.
2. **Request Management Module:**
   - **Create Request:** Enables sellers to create new scrap requests by providing necessary details.
   - **View Requests:** Allows users to view a list of available scrap requests.
   - **Update Request:** Enables sellers to update the details of their existing requests.

- **Delete Request:** Allows sellers to delete their requests.
- **Draft Request:** Provides functionality to save requests as drafts, allowing sellers to complete and publish them later.

3. **Transaction Management Module:**
   - **Accept Request:** Allows buyers to accept scrap requests and initiate transactions.
   - **Confirm Transaction:** Enables sellers to confirm the completion of a transaction.
   - **View Transactions:** Allows users to view their transaction history.
4. **Report Management Module:**
   - **View Reported Requests:** Allows users to view reported requests.
   - **Report Request:** Enables users to report inappropriate or problematic requests.
   - **Appeal Report:** Provides a mechanism for users to appeal against reported requests.
5. **Admin Management Module:**
   - **Review Reports:** Enables admins to review reported requests and take appropriate actions.
   - **Manage Users:** Allows admins to manage user profiles and perform administrative actions.
   - **View Platform Activities:** Provides admins with an overview of platform activities and user interactions.
6. **Draft Management Module:**
   - **Create Draft:** Enables users to save incomplete requests as drafts.
   - **View Drafts:** Allows users to view and manage their draft requests.
   - **Publish Draft:** Provides functionality to publish a draft request as an active listing.
7. **Statistics Module:**
   - **Platform Statistics:** Displays statistics on the total number of users, total connected persons, and other platform-wide metrics.
   - **User Statistics:** Shows individual user statistics, including total transactions, completed requests, and other relevant metrics.

By integrating these modules, the Scrap-Z platform ensured a comprehensive and efficient experience for all users, from creating and managing requests to handling transactions and monitoring platform activities.

4.2 Testing

Unit testing focuses on verifying the functionality of individual components/modules of the Scrap-Z platform. Below are some of the test cases used for unit testing:

Table 4.6: Test Cases for User Management Module of Scrap-Z

ID	Test Case Description	Tested Data	Expected Result	Actual Result	Test Result
TC-UMM-1	User Registration	Test user registration with valid data such as full name, password	Each step involves input fields; Fields show error message if the data isn't inserted according to rule	When inserted random illegal input the module shows error	Pass
TC-UMM-2	User Login	Inserted Registered Email Id and Password	Login the system go to their dashboard according to user type	The system logged in and displayed user-specific dashboard	Pass
TC-UMM-3	User Login	Inserted wrong random email address and random password	Display login error and the system should not show user-specific dashboard	The system showed error and did not log in the user-specific dashboard	Pass
TC-UMM-4	Profile Update	View and Update profile information	Under user dashboard when clicking profile option the previously inserted data will be shown and user can edit profile information	User's Data displayed and data updated successfully	Pass

TC-UMM-5	Delete Profile	Delete all user’s data from database	Delete user profile with all dependencies such as created associated requests and stats	User’s data and associated dependencies deleted successfully	Pass

Table 4.7 Test Cases for Request Management Module of Scrap-Z

ID	Test Case Description	Tested Data	Expected Result	Actual Result	Test Result
TC-RMM-1	Create Request	Provide necessary details for a scrap request	Request should be successfully created	Request created successfully	Pass
TC-RMM-2	View Requests	View list of available scrap requests	List of requests should be displayed	Requests displayed successfully	Pass
TC-RMM-3	Update Request	Update the details of an existing request	Request should be successfully updated	Request updated successfully	Pass
TC-RMM-4	Delete Request	Delete an existing request	Request should be successfully deleted	Request deleted successfully	Pass
TC-RMM-5	Draft Request	Save a request as a draft	Draft should be successfully saved	Draft saved successfully	Pass

Table 4.8 Test Cases for Transaction Management Module

ID	Test Case Description	Tested Data	Expected Result	Actual Result	Test Result
TC-TMM-1	Accept Request	Buyer accepts a scrap request	Request should be successfully accepted	Request accepted successfully	Pass
TC-TMM-2	Confirm Transaction	Seller confirms the completion of a transaction	Transaction should be successfully confirmed	Transaction confirmed successfully	Pass
TC-TMM-3	View Transactions	View transaction history	Transaction history should be displayed	Transaction history displayed successfully	Pass

Table 4.9 Test Cases for Report Management Module of Scrap-Z

ID	Test Case Description	Tested Data	Expected Result	Actual Result	Test Result
TC-RPM-1	Report Request	Report a problematic request	Request should be successfully reported	Request reported successfully	Pass
TC-RPM-2	View Reported Requests	View list of reported requests	Reported requests should be displayed	Reported requests displayed successfully	Pass
TC-RPM-3	Appeal Report	User appeals against a reported request	Appeal should be processed correctly	Appeal processed successfully	Pass

Table 4.10: Test Cases for Admin Management Module of Scrap-Z

ID	Test Case Description	Tested Data	Expected Result	Actual Result	Test Result
TC-AMM-1	Review Reports	Admin reviews reported requests	Reports should be reviewed and actions taken	Reports reviewed and actions taken	Pass
TC-AMM-2	Manage Users	Admin manages user profiles	Admin should be able to manage users effectively	Users managed successfully	Pass
TC-AMM-3	View Platform Activities	Admin views platform activities	Platform activities should be displayed	Platform activities displayed successfully	Pass

Table 4.11: Test Cases for Draft Management Module of Scrap-Z

ID	Test Case Description	Tested Data	Expected Result	Actual Result	Test Result
TC-DMM-1	Create Draft	Save a request as a draft	Draft should be successfully created	Draft created successfully	Pass
TC-DMM-2	View Drafts	View list of draft requests	Draft requests should be displayed	Draft requests displayed successfully	Pass
TC-DMM-3	Publish Draft	Publish a draft request	Draft should be successfully published	Draft published successfully	Pass

Table 4.12: Test Cases for Statistics Module of Scrap-Z

ID	Test Case Description	Tested Data	Expected Result	Actual Result	Test Result
TC-SMM-1	Platform Statistics	Display platform statistics	Platform statistics should be displayed correctly	Platform statistics displayed correctly	Pass
TC-SMM-2	User Statistics	Display user statistics	User statistics should be displayed correctly	User statistics displayed correctly	Pass

4.2.2 Test Cases for System Testing

System testing involves testing the complete system to ensure it meets the specified requirements and functions correctly. Below are some of the test cases used for system testing:

Table 4.13: System Test Cases

ID	Test Case Description	Test Data	Expected Result	Actual Result	Test Result
ST-UM-001	Test end-to-end user registration and login process	Valid registration details	User should be successfully registered and logged in	User registered and logged in successfully	Pass
ST-UM-002	Test updating and deleting a user profile	User profile data	User profile should be updated and then deleted	User profile updated and deleted successfully	Pass
ST-RM-001	Test creating, viewing, updating, and deleting requests	Request data	Requests should be created, viewed, updated,	Requests managed successfully	Pass

			and deleted successfully		
ST-TM-001	Test the complete transaction workflow from request acceptance to confirmation	Request ID, Buyer ID, Seller ID	Transactions should be processed successfully from acceptance to confirmation	Transactions processed successfully	Pass
ST-RPM-001	Test reporting a request and reviewing it as an admin	Report data	Requests should be reported and reviewed successfully	Requests reported and reviewed successfully	Pass
ST-RPM-002	Test the appeal process for reported requests	Appeal data	Appeals should be processed correctly	Appeals processed successfully	Pass
ST-DM-001	Test creating, viewing, and publishing draft requests	Draft request data	Draft requests should be managed and published successfully	Draft requests managed and published successfully	Pass
ST-SM-001	Test the display of platform and user statistics	N/A	Statistics should be displayed correctly	Statistics displayed correctly	Pass
ST-AM-001	Test admin reviewing reports and managing users	Admin actions data	Admin should be able to review reports and manage users effectively	Reports reviewed and users managed successfully	Pass
ST-AD-001	Test admin access to admin dashboard	Admin Dashboard URL	Admin should access admin dashboard successfully	Admin accessed admin	Pass

				dashboard successfully	
ST-AD-002	Test invalid access to admin dashboard by a regular user	Admin Dashboard URL	Should redirect to login page	Redirected to login page	Pass
ST-AD-003	Test invalid access to admin dashboard by a buyer	Admin Dashboard URL	Should redirect to login page	Redirected to login page	Pass
ST-AD-004	Test invalid access to admin dashboard by a seller	Admin Dashboard URL	Should redirect to login page	Redirected to login page	Pass
ST-CR-001	Test create request page	Create Request URL	Should display create request form	Create request form displayed	Pass
ST-VR-001	Test view requests page	View Requests URL	Should display list of requests	List of requests displayed	Pass
ST-US-001	Test user statistics page	User Statistics URL	Should display user statistics	User statistics displayed	Pass
ST-AD-005	Test valid admin login	Valid admin credentials	Should set session and redirect to admin dashboard	Session set and redirected to admin dashboard	Pass
ST-AD-006	Test admin logging out	Admin logout action	Should clear session and redirect to login page	Session cleared and redirected to login page	Pass

These testing cases ensured that the Scrap-Z platform was met all specified requirements.

Chapter 5: Conclusion and Future Recommendations

5.1 Outcomes

The Scrap-Z project successfully created a digital platform that streamlined the process of scrap material collection. This platform facilitated a more efficient connection between scrap collectors and individuals seeking to dispose of their scrap responsibly. Users could easily create, view, and manage scrap requests, while scrap collectors could access and respond to these requests seamlessly. The platform also provided an administrative interface to manage users and oversee the reported requests. Overall, the development and implementation of Scrap-Z demonstrated the potential of digital solutions in enhancing sustainability through effective waste management.

5.2 Conclusion

In summary, Scrap-Z emerged as a user-friendly web application aimed at revolutionizing the scrap collection process. By addressing the inefficiencies and limitations of traditional methods, it provided a robust solution that connected individual buyers directly with sellers. The project documentation highlighted the development process, including the technical challenges and solutions implemented. Scrap-Z not only facilitated better communication and transaction efficiency but also contributed to environmental sustainability by promoting the responsible disposal of scrap materials. The success of Scrap-Z underscored the importance of integrating digital innovations in traditional sectors for improved outcomes.

5.3 Future Recommendations

- **Mobile Application Development**: To enhance accessibility and convenience, developing a mobile application would allow users to manage scrap requests on the go.
- **Real-Time Transactions**: Integrating real-time transaction processing would enhance the immediacy and reliability of financial exchanges between sellers and buyers, providing a seamless and secure payment experience.
- **Real-Time Chat Integration**: Adding a real-time chat feature would facilitate immediate communication between sellers and buyers, improving coordination.

- **Guest User Access**: Allowing guest users to view and interact with scrap requests could broaden the user base and encourage more transactions.
- **Backup and Recovery Options**: Implementing backup solutions for deleted requests and profiles would ensure data safety and recovery in case of accidental deletions.
- **Enhanced Admin Tools**: Providing more dynamic tools for admins to manage content and features, similar to a CMS, would allow for more flexibility and customization.
- **Improved Sorting Mechanisms**: Refining the request sorting system to ensure new requests are easily visible, even with a high volume of daily entries, would improve user experience and engagement.

By addressing these areas, Scrap-Z could further enhance its functionality and user satisfaction, establishing itself as a leading platform in the scrap collection industry.

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[4] "Scrap Uncle," [Online]. Available: https://www.scrapuncle.com.

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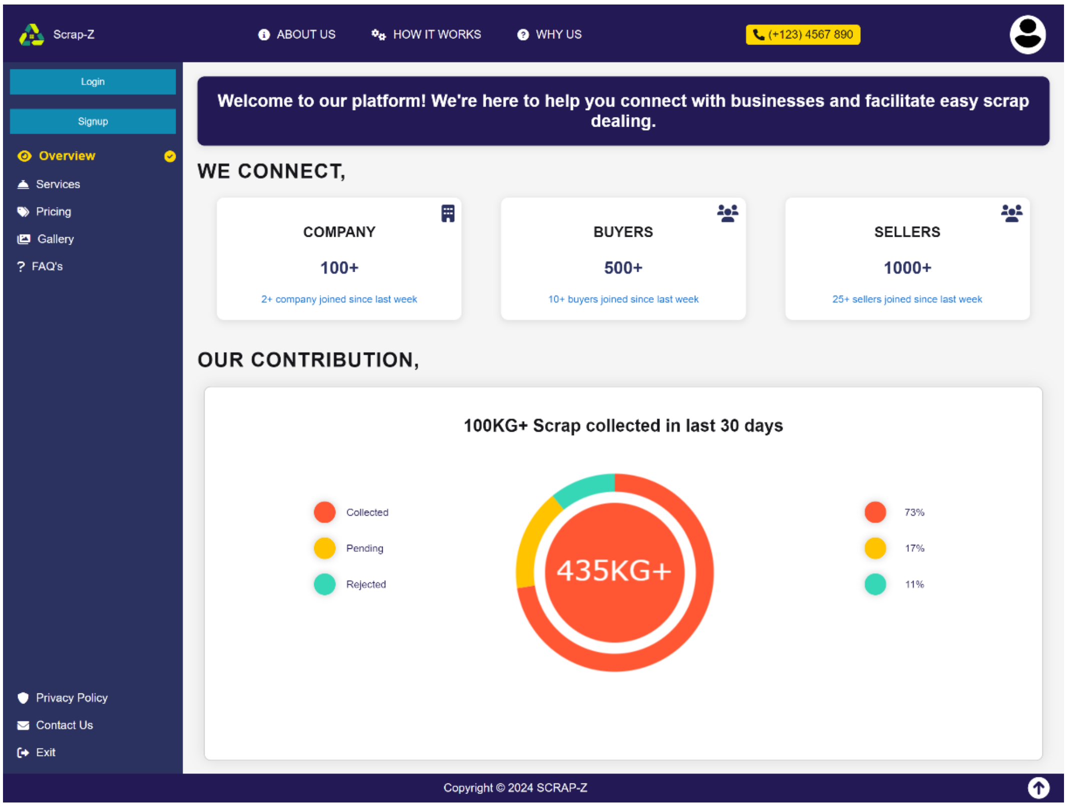
[7] "Khali Sisi," [Online]. Available: https://www.khaalisisi.com.

Appendices



Welcome to our platform! We're here to help you connect with businesses and facilitate easy scrap dealing.

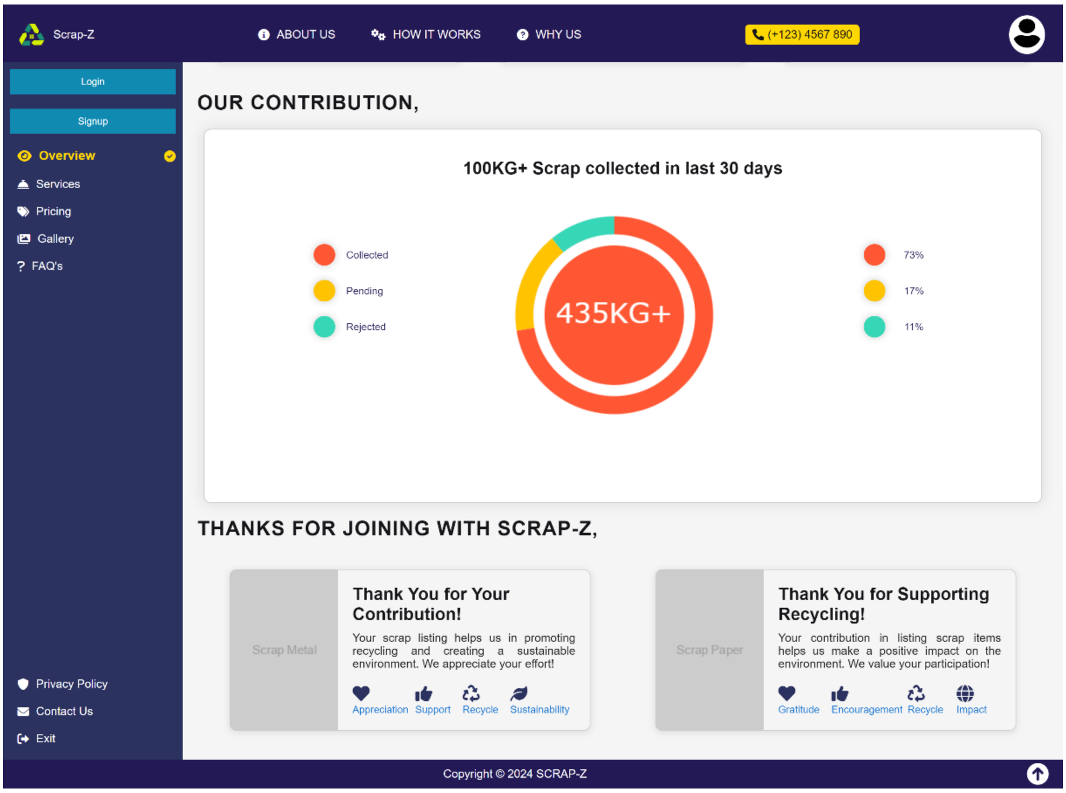
WE CONNECT,

COMPANY	BUYERS	SELLERS
100+	500+	1000+
2+ company joined since last week	10+ buyers joined since last week	25+ sellers joined since last week

OUR CONTRIBUTION,

100KG+ Scrap collected in last 30 days

Copyright © 2024 SCRAP-Z



OUR CONTRIBUTION,

100KG+ Scrap collected in last 30 days

THANKS FOR JOINING WITH SCRAP-Z,

Thank You for Your Contribution!

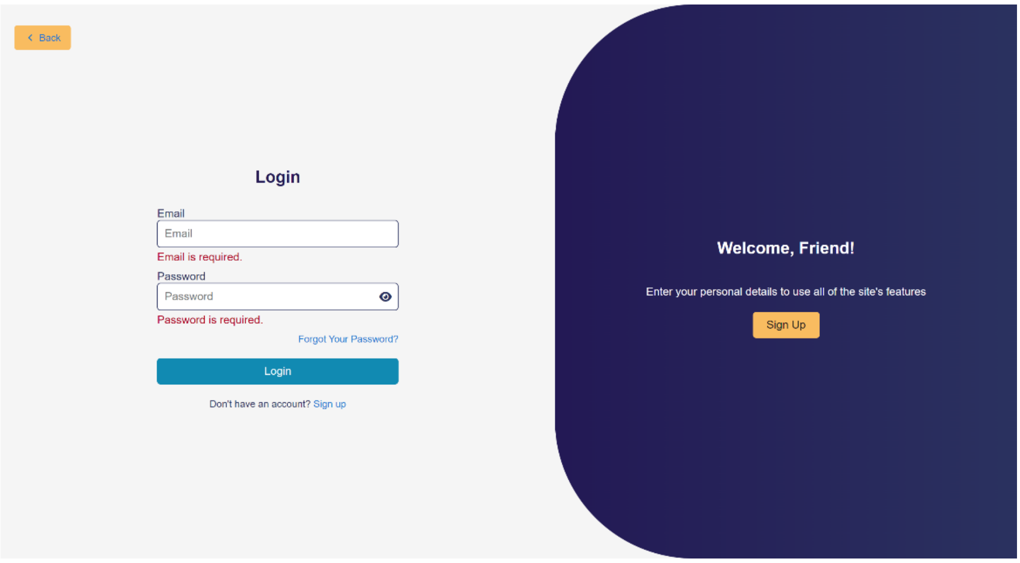
Your scrap listing helps us in promoting recycling and creating a sustainable environment. We appreciate your effort!

Thank You for Supporting Recycling!

Your contribution in listing scrap items helps us make a positive impact on the environment. We value your participation!

Copyright © 2024 SCRAP-Z

DashBoard Page



‹ Back

Login

Email

Email

Email is required.

Password

Password

Password is required.

Forgot Your Password?

Login

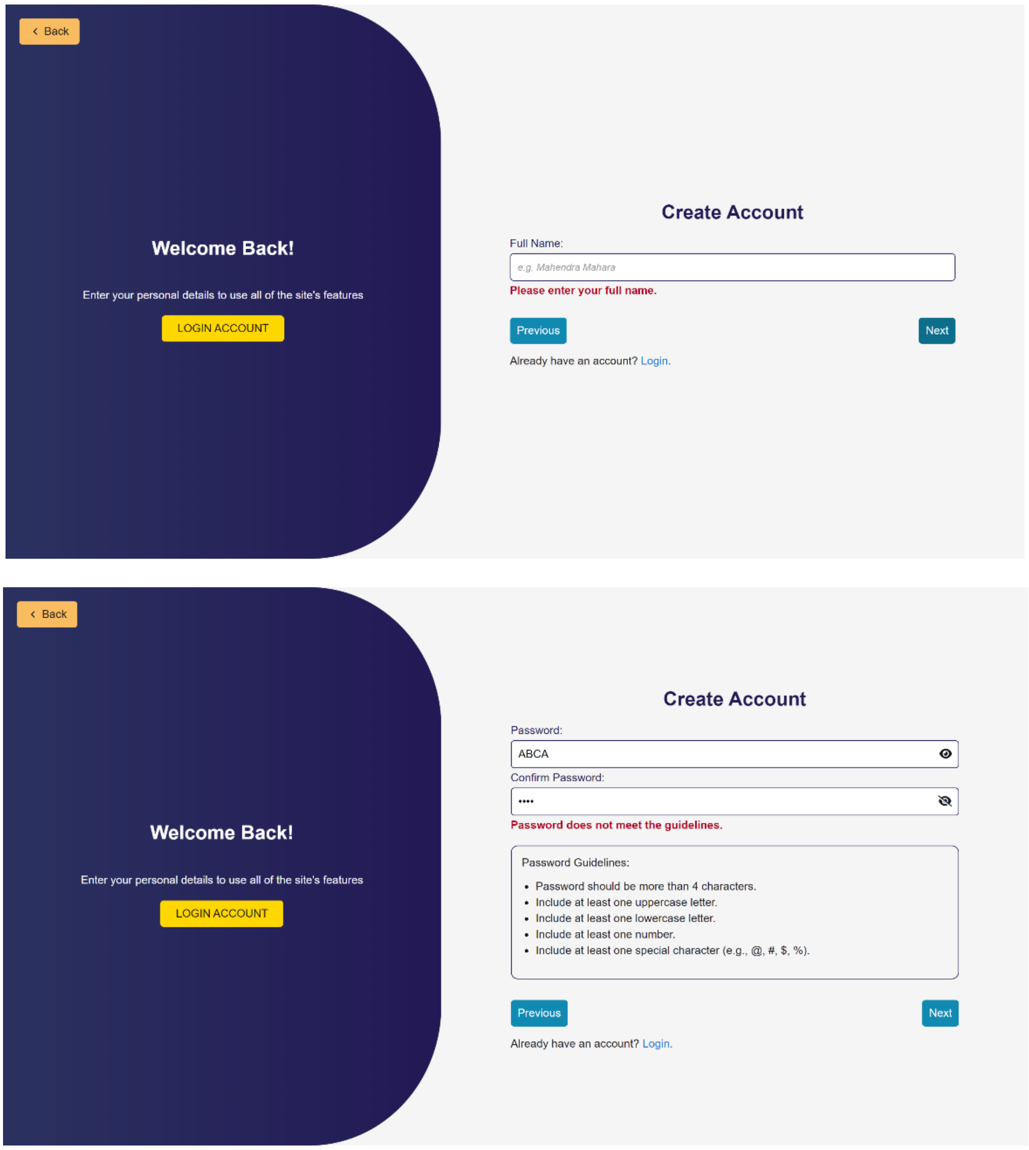
Don't have an account? Sign up

Welcome, Friend!

Enter your personal details to use all of the site's features

Sign Up

Login Page



‹ Back

Welcome Back!

Enter your personal details to use all of the site's features

LOGIN ACCOUNT

Create Account

Full Name:

e.g. Mahendra Mahara

Please enter your full name.

Previous

Next

Already have an account? Login.

‹ Back

Welcome Back!

Enter your personal details to use all of the site's features

LOGIN ACCOUNT

Create Account

Password:

ABCA

Confirm Password:

••••

Password does not meet the guidelines.

Password Guidelines:

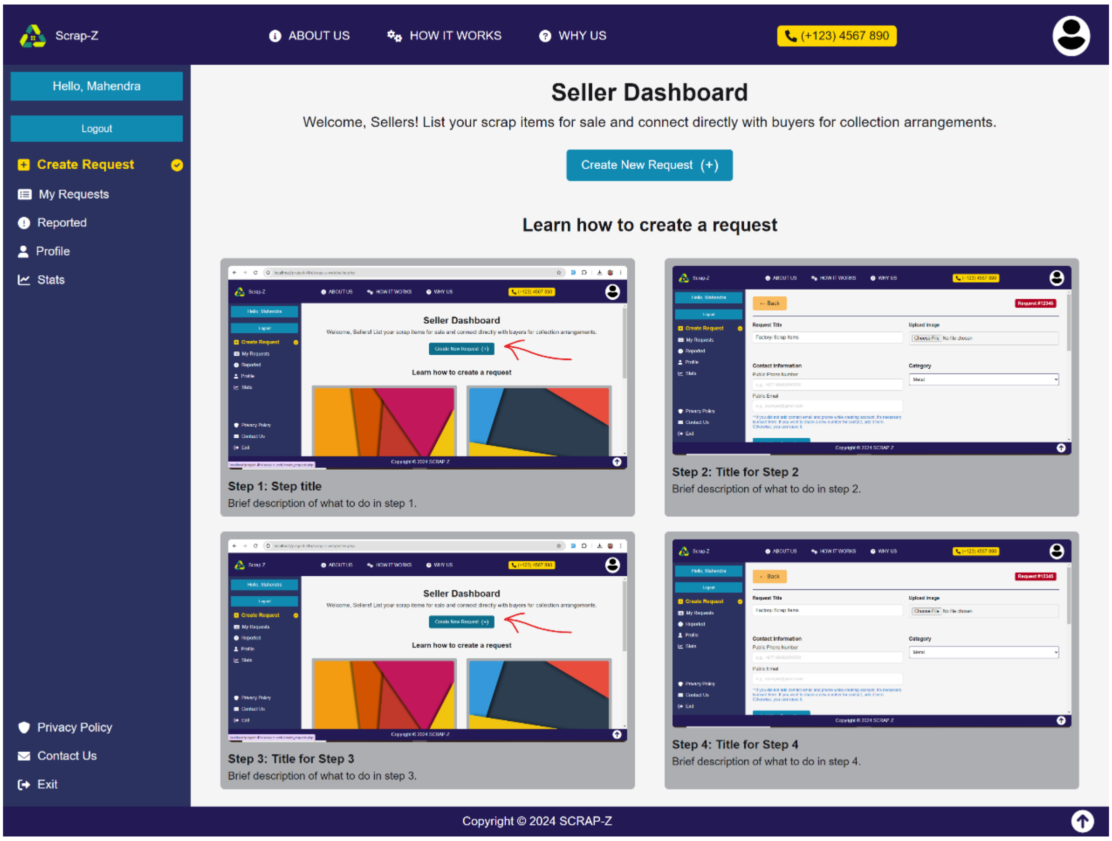
- Password should be more than 4 characters.
- Include at least one uppercase letter.
- Include at least one lowercase letter.
- Include at least one number.
- Include at least one special character (e.g., @, #, $, %).

Previous

Next

Already have an account? Login.

Signup Page



Seller Dashboard

Welcome, Sellers! List your scrap items for sale and connect directly with buyers for collection arrangements.

Learn how to create a request

Step 1: Step title
Brief description of what to do in step 1.

Step 2: Title for Step 2
Brief description of what to do in step 2.

Step 3: Title for Step 3
Brief description of what to do in step 3.

Step 4: Title for Step 4
Brief description of what to do in step 4.

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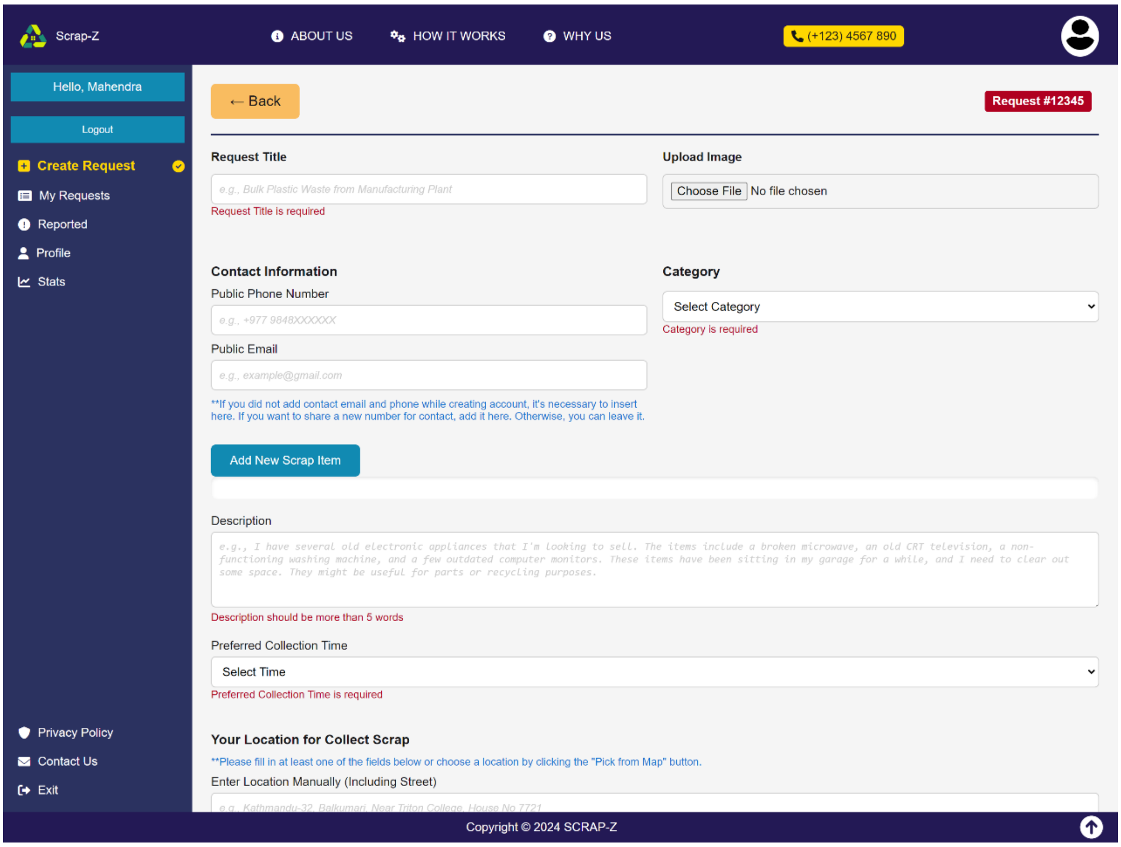
Seller Dashboard Page



Request Title
e.g., Bulk Plastic Waste from Manufacturing Plant
Request Title is required

Upload Image
Choose File No file chosen

Contact Information
Public Phone Number
e.g., +977 9848XXXXXX
Public Email
e.g., example@gmail.com
**If you did not add contact email and phone while creating account, it's necessary to insert here. If you want to share a new number for contact, add it here. Otherwise, you can leave it.

Category
Select Category
Category is required

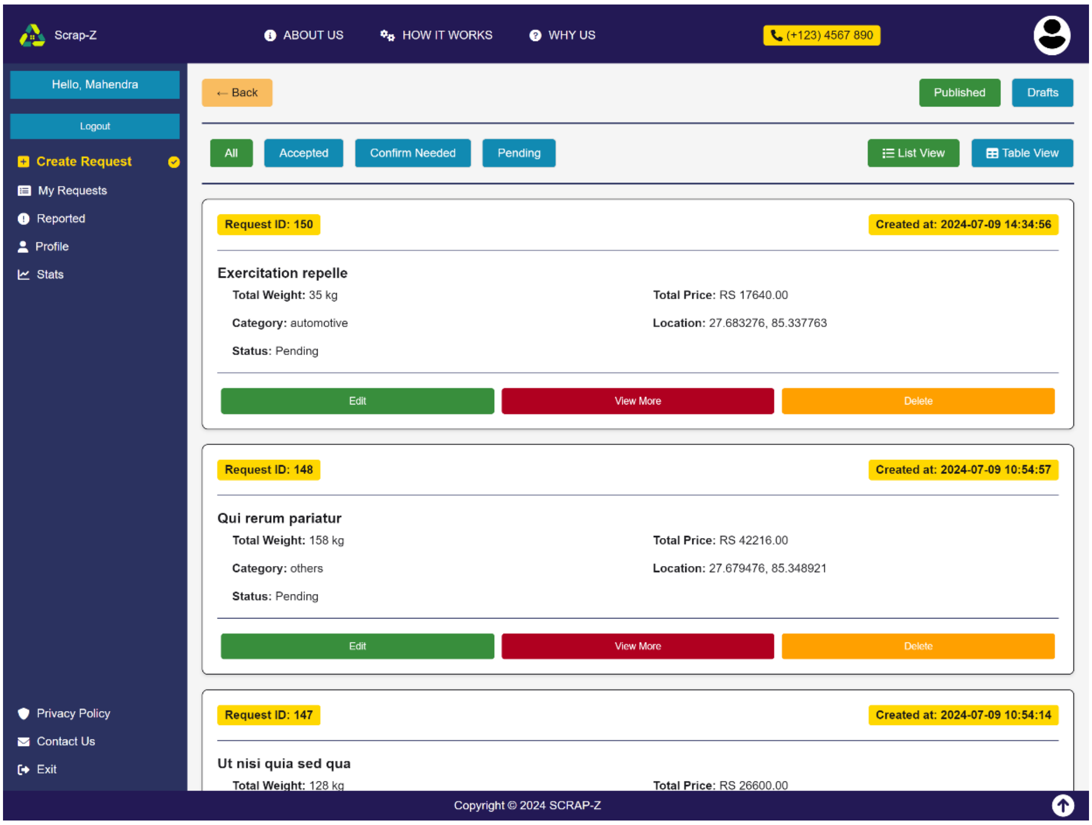
Description
e.g., I have several old electronic appliances that I'm looking to sell. The items include a broken microwave, an old CRT television, a non-functioning washing machine, and a few outdated computer monitors. These items have been sitting in my garage for a while, and I need to clear out some space. They might be useful for parts or recycling purposes.
Description should be more than 5 words

Preferred Collection Time
Select Time
Preferred Collection Time is required

Your Location for Collect Scrap
**Please fill in at least one of the fields below or choose a location by clicking the "Pick from Map" button.
Enter Location Manually (Including Street)
e.g. Kathmandu-32, Balkumari, Near Triton College, House No 7721

Copyright © 2024 SCRAP-Z

Create Request Page



Request ID: 150
Created at: 2024-07-09 14:34:56

Exercitation repelle

Total Weight: 35 kg
Total Price: RS 17640.00
Category: automotive
Location: 27.683276, 85.337763
Status: Pending

Request ID: 148
Created at: 2024-07-09 10:54:57

Qui rerum pariatur

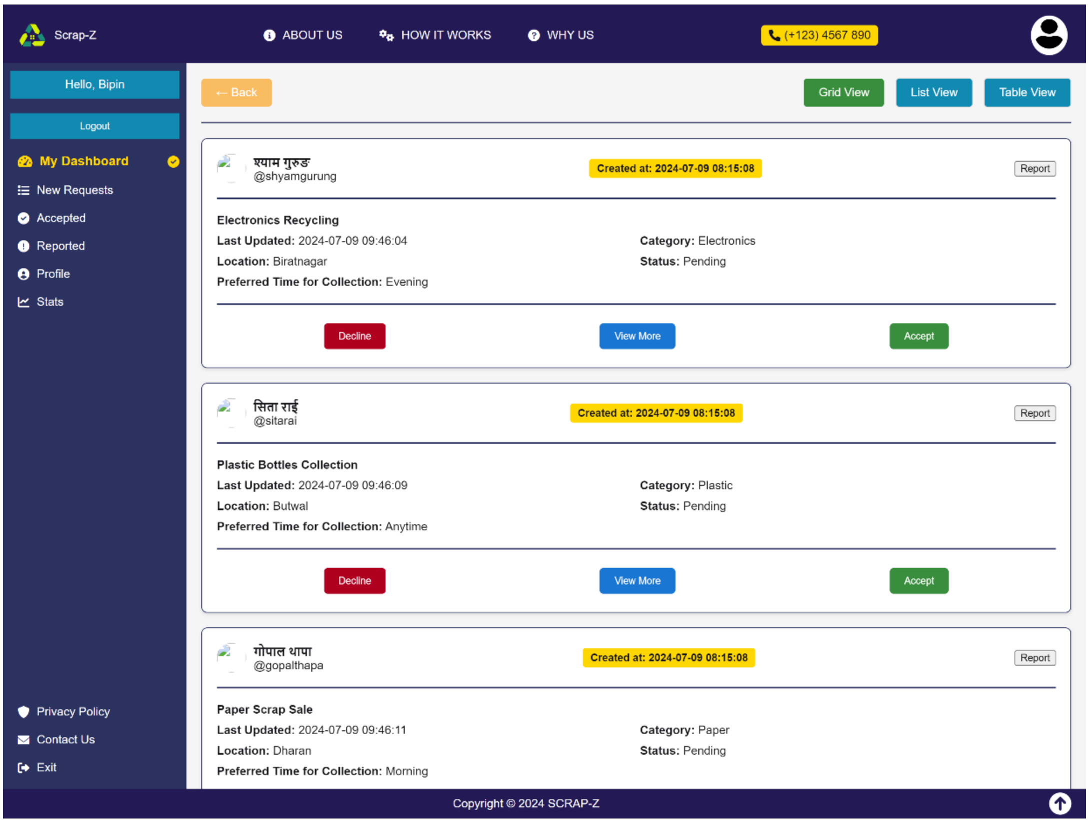
Total Weight: 158 kg
Total Price: RS 42216.00
Category: others
Location: 27.679476, 85.348921
Status: Pending

Request ID: 147
Created at: 2024-07-09 10:54:14

Ut nisi quia sed qua

Total Weight: 128 kg
Total Price: RS 26600.00

Request Display Page (Seller)



श्याम गुरुङ
@shyamgurung
Created at: 2024-07-09 08:15:08

Electronics Recycling
Last Updated: 2024-07-09 09:46:04
Category: Electronics
Location: Biratnagar
Status: Pending
Preferred Time for Collection: Evening

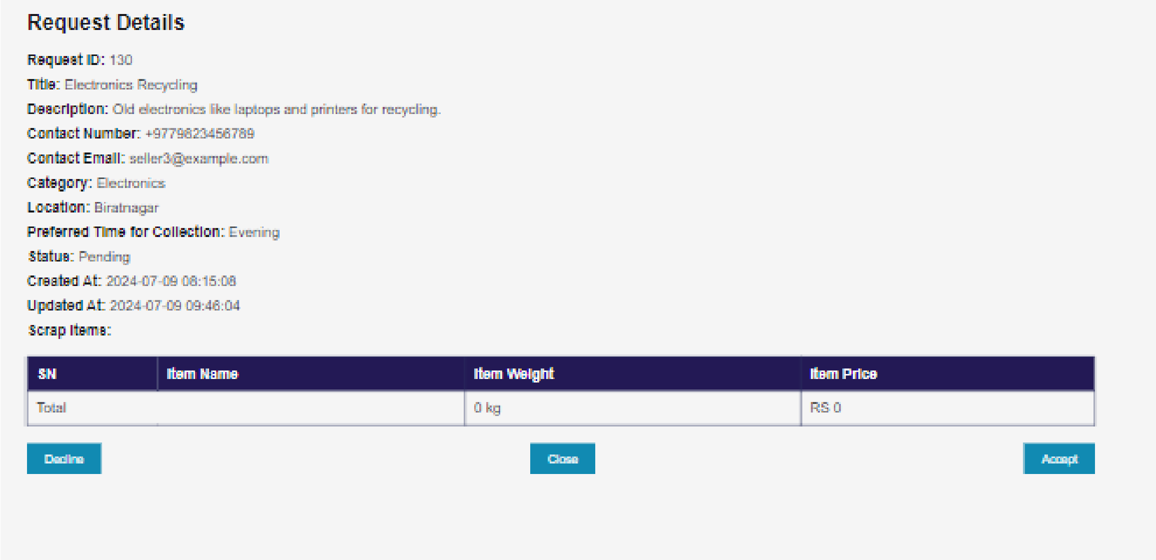
सिता राई
@sitarai
Created at: 2024-07-09 08:15:08

Plastic Bottles Collection
Last Updated: 2024-07-09 09:46:09
Category: Plastic
Location: Butwal
Status: Pending
Preferred Time for Collection: Anytime

गोपाल थापा
@gopalthapa
Created at: 2024-07-09 08:15:08

Paper Scrap Sale
Last Updated: 2024-07-09 09:46:11
Category: Paper
Location: Dharan
Status: Pending
Preferred Time for Collection: Morning

Request Display Page (Buyer)

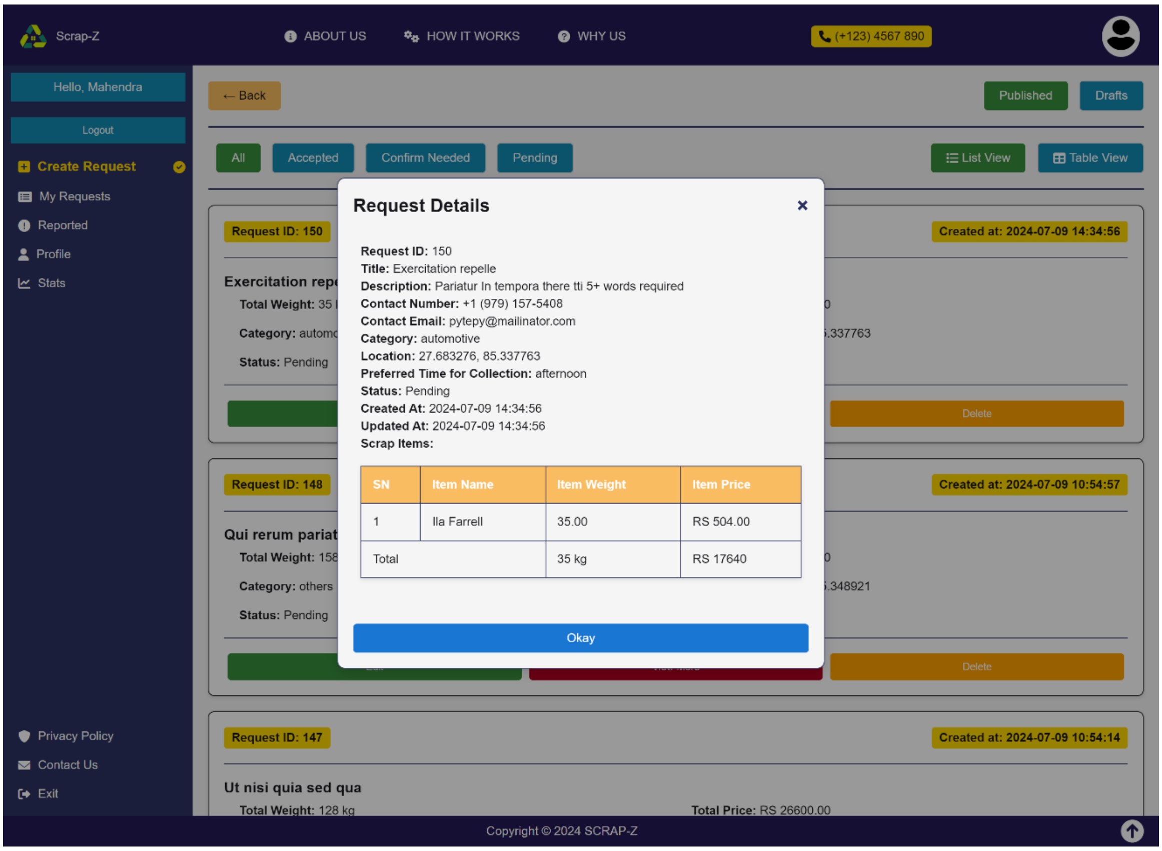


Request Details

Request ID: 130
Title: Electronics Recycling
Description: Old electronics like laptops and printers for recycling.
Contact Number: +9779823456789
Contact Email: seller3@example.com
Category: Electronics
Location: Biratnagar
Preferred Time for Collection: Evening
Status: Pending
Created At: 2024-07-09 08:15:08
Updated At: 2024-07-09 09:46:04
Scrap Items:

SN	Item Name	Item Weight	Item Price
Total		0 kg	RS 0

View Request Modal (Buyer)



Request Details

Request ID: 150
Title: Exercitation repelle
Description: Pariatur In tempora there tti 5+ words required
Contact Number: +1 (979) 157-5408
Contact Email: pytepy@mailinator.com
Category: automotive
Location: 27.683276, 85.337763
Preferred Time for Collection: afternoon
Status: Pending
Created At: 2024-07-09 14:34:56
Updated At: 2024-07-09 14:34:56
Scrap Items:

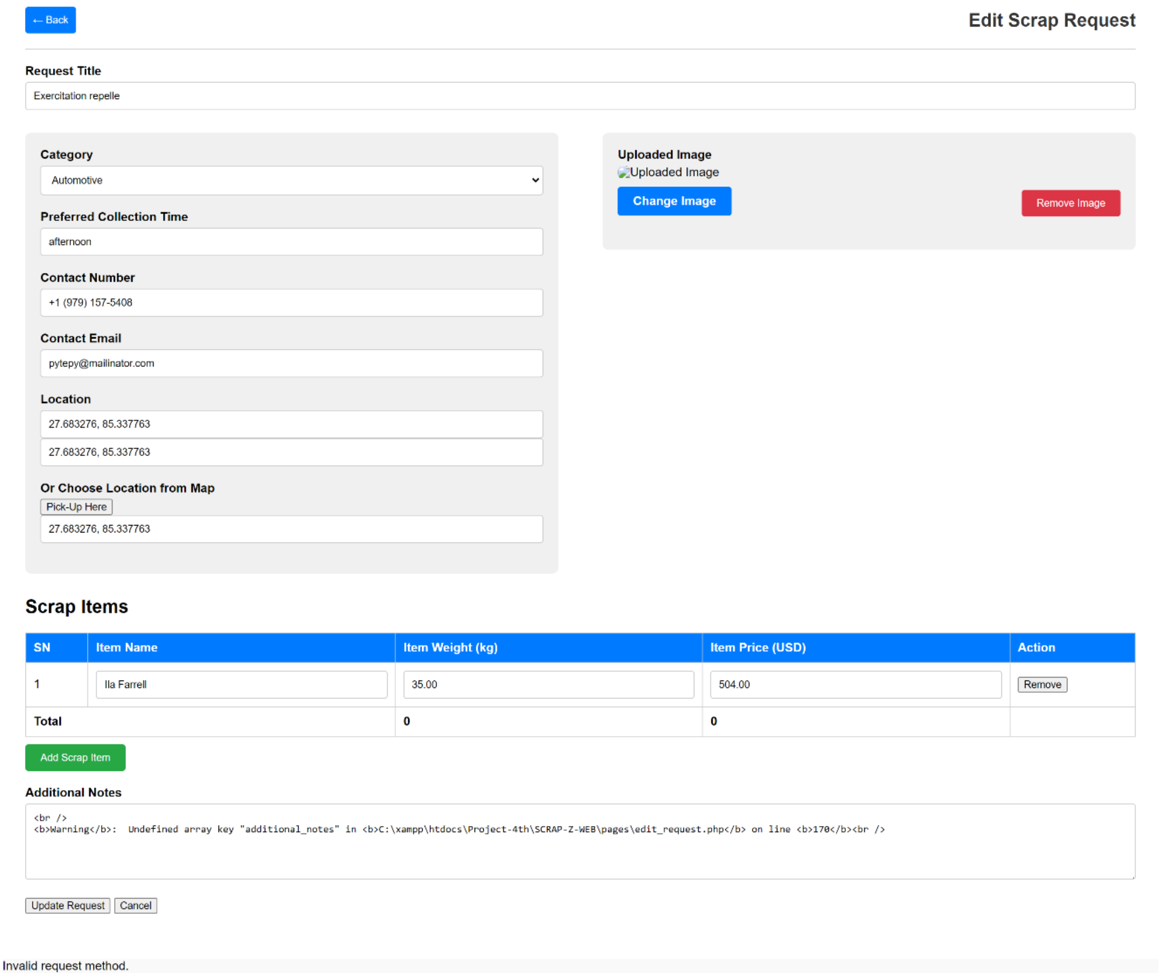
SN	Item Name	Item Weight	Item Price
1	Ila Farrell	35.00	RS 504.00
Total		35 kg	RS 17640

Exercitation repe
Total Weight: 35
Category: automo
Status: Pending

Qui rerum pariat
Total Weight: 158
Category: others
Status: Pending

Ut nisi quia sed qua
Total Weight: 128 kg
Total Price: RS 26600.00

View Request Modal (Seller)



Edit Scrap Request

Request Title
Exercitation repelle

Category
Automotive

Preferred Collection Time
afternoon

Contact Number
+1 (979) 157-5408

Contact Email
pytepy@mailinator.com

Location
27.683276, 85.337763
27.683276, 85.337763

Or Choose Location from Map
27.683276, 85.337763

Uploaded Image
Uploaded Image

Scrap Items

SN	Item Name	Item Weight (kg)	Item Price (USD)	Action
1	Ila Farrell	35.00	504.00	Remove
Total		0	0	

Additional Notes

```
<br />
<b>Warning</b>:  Undefined array key "additional_notes" in <b>C:\xampp\htdocs\Project-4th\SCRAP-Z-WEB\pages\edit_request.php</b> on line <b>170</b><br />
```

Invalid request method.

Edit Request Modal (Seller)

Validation Modules:

Login Page:

```
    <h2>Login</h2>

    <form id="loginForm" action="<?php echo
htmlspecialchars($_SERVER["PHP_SELF"]); ?>" method="POST">

        <div class="form-group">

            <label for="email">Email</label>

            <input type="email" id="email" name="email" placeholder="Email"
value="<?php echo isset($email) ? htmlspecialchars($email) : ''; ?>">

            <?php if (!empty($errors["email"])) : ?>
            <span class="error" id="emailError"><?php echo $errors["email"];
?></span>
          <?php endif; ?>
        </div>
        <div class="form-group">
          <label for="password">Password</label>
          <div class="password-input">
            <input type="password" id="password" name="password"
placeholder="Password">
            <i class="fa fa-eye" id="togglePassword"></i>
          </div>
          <?php if (!empty($errors["password"])) : ?>
            <span class="error" id="passwordError"><?php echo $errors["password"];
?></span>
          <?php endif; ?>
        </div>
        <?php if (!empty($errors["login"])) : ?>
          <span class="error" id="loginError"><?php echo $errors["login"]; ?></span>
        <?php endif; ?>

        <a href="#">Forgot Your Password?</a>
        <button type="submit">Login</button>
        <div class="signup-link">
          Don't have an account? <a href="signup.php">Sign up</a>
        </div>
        </form>
```

Login Page Validation:

```
<?php
session_start();
if (isset($_SESSION['user_email'])) {
   if (isset($_SESSION['seller_id'])) {
      header("Location: seller.php");
      exit;
   } elseif (isset($_SESSION['buyer_id'])) {
      header("Location: buyer.php");
      exit;
   }
}

require_once("connection/db_connection.php");
$errors = [];
if ($_SERVER["REQUEST_METHOD"] == "POST") {
   $email = trim($_POST['email']);
   $password = trim($_POST['password']);
   if (empty($email)) {
      $errors["email"] = "Email is required.";
   } elseif (!filter_var($email, FILTER_VALIDATE_EMAIL)) {
      $errors["email"] = "Invalid email format.";
   } else{
        $_SESSION['user_email'] = $email;
    }
    if (empty($password))  {
        $errors["password"] = "Password is required.";
    }

    if (empty($errors))  {
        $email = $connect->real_escape_string($email);
        $sql = "SELECT user_id, full_name, user_type, password_hash FROM User
WHERE email = '$email'";
        $result = $connect->query($sql);

        if ($result->num_rows  == 1) {
            $row = $result->fetch_assoc();
            if (password_verify($password,  $row['password_hash'])) {
                $_SESSION['name'] = $row['full_name'];
                if ($row['user_type'] === "seller")  {
                    $_SESSION['seller_id'] = $row['user_id'];
                    header("Location:  seller.php");
                    exit();
                } elseif ($row['user_type'] === "buyer") {
                    $_SESSION['buyer_id'] = $row['user_id'];
                    header("Location:  buyer.php");
                    exit();
                } else {
                    header("Location: index.php");
                    exit();
                }
            } else {
                $errors["login"] = "Invalid email or password.";
            }
        } else {
            $errors["login"] = "Invalid email or password.";
        }
    }
}
$connect->close();
?>
```