

Waste Exchange System

A Software Project Submitted

By

|  |  |
| --- | --- |
| Name | ID |
| **Ahsan Habib** | 17-34014-1 |
| **Islam, Lamia** | 17-33875-1 |
| **Ahmed, Sinthia** | 17-33820-1 |

Under the supervision of

**Dr. Dip Nandi**

Associate Professor and Director

Faculty of Science and Technology

American International University- Bangladesh

Summer Semester 2018-2019

**Disclaimer**

This is to certify that this project is our original work. No part of this has been submitted elsewhere partially or fully for the award of any other degree. Any material reproduced in this project has been properly acknowledged.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Name: Ahsan Habib

ID: 17-34014-1

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Name: Islam, Lamia

ID: 17-33875-1

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Name: Ahmed, Sinthia

ID: 17-33820-1

## 

**Approval**

The Software Project titled “Waste Exchange System” has been submitted to the following respected members of the Board of Examiners of the Faculty of Science and Information Technology in partial fulfillment of the requirements on? December 2019 and has been accepted satisfactory.

|  |  |
| --- | --- |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Dr. Dip Nandi**  Supervisor  Associate Professor and Director  Faculty of Science and Technology  American International University- Bangladesh | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Abhijit Bhowmik**  Co-Supervisor  Senior Assistant Professor and Special Assistant  Office of Student Affairs  Department of Computer Science  American International University- Bangladesh |
| \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Dr. M M Mahbubul Syeed** Associate Professor andHead (Undergraduate)  Faculty of Science and Technology  American International University- Bangladesh | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  **Professor Dr. Tafazzal Hossain**  Dean in Charge  Faculty of Science and Technology American International University-Bangladesh |

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Dr. Carmen Z. Lamagna**

Vice Chancellor

American International University-Bangladesh

**Acknowledgements**

We would like to take the chance to express our gratitude to our honorable teacher and Supervisor, Dr. Dip Nandi and Co-Supervisor, Abhijit Bhowmik for their continuous guidance and support regarding this report. Beside this, we have found so many sincere and productive advice from many people that we would like to pay homage to them.

## 

## Table of Contents

### Topic Page Number

1. Statement Of Work

##### 1.1 Introduction

##### Purpose 07

##### Overview of the Present Systems 07

##### Weakness of the Present Systems 07

##### Overview of the Proposed System 07

##### Benefits of the Proposed System 08

##### Project Scope 08

* 1. Document Convention 08

1. Software Requirement Specification
   1. Overall Description
      1. Product Perspective 10
      2. User Classes and Characteristics 11

##### Assumptions 12

* + 1. Design and Implementation Constraints 12
  1. System Features
     1. Admin Features 12
     2. Company Features 12
     3. User Features 13
     4. Registered User Features 13
     5. Collector Features 13
  2. User Requirements 13
  3. Functional Requirements 16
  4. Quality Attributes 18

1. System Design
   1. Use Case Diagram 19

##### Activity Diagram 21

##### Class Diagram 24

##### ER (Entity Relationship) Diagram 25

##### Data Dictionary 26

1. Software Project Management Plan
   1. Effort Estimation 28

##### Work Breakdown Structure 29

##### Activity Planning

##### Sequencing and Scheduling Activities 30

##### Network Model 31

##### Resource Analysis 32

##### Hardware and Software Requirements 33

##### Human Resource Requirements 34

##### Risk Analysis 35

1. Software Test Plan
   1. Functional Requirement Test Plan 37
   2. Non-Functional Requirement Test Plan 45

6. References 53

##### 

# Chapter 1: Statement of Work

## 1.1. Introduction

### 1.1.1. Purpose

Waste pollution as an issue is massively wide ranging, and can be difficult to fully measure. Because of this we are facing hazards like fires and explosions, vegetation damage, landfill settlement, groundwater pollution, air pollution and global warming. We can reduce waste pollution via reducing our waste, re-using and repairing items we throw out, recycling, upgrading and improving the effectiveness of waste management and containment system in our country. Based on this, to add value to the waste we propose a “Waste Exchange System” for the above mentioned problem.

### 1.1.2. Overview of the Present System

Waste management is a topic that is still being discussed on how to properly manage and recycle waste without harming the environment. There are many present systems where they presented ideas about how to manage waste. “The Waste Exchange” is an app where it connects construction wastes and wastes collecting companies online and has pick-up service. “E-Waste Exchange INDIA” is another app responsible for e-waste collection and transferring them to recyclers. Another idea was presented by “Klean Industries” where they combined the blockchain system and waste collection and recycling by using cryptocurrency called klean coins. The industry collects wastes and recycles it.

### 1.1.3. Weakness of the Present System

Though the present ideas and systems are great but it does not fulfill the idea of waste management completely. There are household wastes, plastics, e-wastes which in many countries are generally thrown here and there because of lack of knowledge and ignorance about environment pollution. “The Waste Exchange” system is only for demolition, groundwork and building contractors. “E-Waste Exchange INDIA” is a system for India to collect e-waste. The Klean industries use klean coins to exchange waste but nowadays cryptocurrencies are not very popular nor convenient. These systems exist still there is pollution and people are ignorant.

### 1.1.4. Overview of the Proposed System

Our proposed system is another initiative to save the world from pollution. The “Waste Exchange System” we propose will not only make waste materials collection more organized but also motivate people to collect and store their wastes rather than throwing them. Our system collects wastes like e-waste, plastics, papers, and rewards the waste provider according to the amount of waste. The wastes are then delivered to the waste-collecting companies. Since waste providers will be rewarded with goods in exchange for wastes they will be more enthusiastic to store their waste and benefit from them rather than throwing those random places.

### 1.1.5. Benefits of the Proposed System

In the current situation, there are a lot of waste and recycling companies but they are not very effective. In our vision, our “Waste Exchange System” can bring benefits to our environment.

* Since we propose reward against waste people will be more interested to collect their waste rather than throwing those here and there.
* People can dispose of their e-waste through our system which gives us a hazard-less environment.
* The recycling and manufacturing companies can get easy access to their raw materials through our system.
* Waste will be collected in an organized way so dumpster will not be necessary.
* Frauds cannot perform unethical works like cloning products from the wastes with poor quality as people will be more motivated to stock their used plastics for rewards.

## 1.2. Project Scope

Our proposed system will provide a platform between the normal people and the manufacturing or recycling companies. These companies can collect their raw materials like used plastics, poly bags, papers, glass and e-waste (computers, mobile waste) from people. People can choose the type and quantity of the items using the app. After confirming, a worker from recycling company will come to the given location to collect them. According to the quantity of the items, people can receive money or offered goods by the companies. This will help to keep hazardless environment and to provide green population.

## 1.3. Document Convention

Entire document should be justified.

|  |  |
| --- | --- |
| **Convention for Main Title** |  |
| Font face | Times New Roman |
| Font style | Heading 1 |
| Font size | 20 |
| **Convention for Section Title** |  |
| Font face | Times New Roman |
| Font style | Heading 2 |
| Font size | 16 |
| **Convention for Subsection Title** |  |
| Font face | Times New Roman |
| Font style | Heading 3 |
| Font size | 14 |
| **Convention for body** |  |
| Font face | Times New Roman |
| Font size | 12 |

## 

# Chapter 2: Software Requirement Specification

## 2.1. Overall Description

### 2.1.1. Product Perspective

Waste management system is a web based application and so it will require a browser like Internet Explorer or Google Chrome. The application will be able to connect to a remote server. It will use HTML, CSS, Java Script, PHP, MySQL for its development. This system provides a simple mechanism for waste exchange between users and recycling companies.

The following are the main features that are included in waste management system.

* **Create account:** The system allows the users, companies and collectors to create their accounts in the system and provide features of updating their profile.
* **Login:** After registration user, company and collector can login the system anytime to give or take waste.
* **View and search content:** When user enter into the system he or she can see the content of the portal and can search content about the system.
* **View company information:** User can see the details information of recycling and manufacturing company whose are involved in the system.
* **View collector information and call:** User can see the information of the collectors whose are registered in the system and contact them via call.
* **Waste quantity and type:** Registered user can post the quantity of waste and type like glass, plastic, paper, e-waste etc.
* **Choose preferred reward:** User can choose reward which are preferred by waste receiving company like goods and money.
* **View own collection records:** Company can check their own records of collecting waste in details.
* **Post offers and rewards:** Company can post offers and rewards so that they can get attention by as much as customers or users.
* **View collectors list and assign:** Each company has access to view collectors list and assign them work.
* **Register:** Collectors can registered themselves in the system so that they can take frequent work.
* **Receive user information:** Collectors receive user information so they can contact with the users.
* **Send arrival time:** Collectors can send arrival time to users for collecting waste.
* **Collect waste and deliver reward:** Collectors collect waste for company and deliver reward to user offered by company.
* **Waste collection record:** Admin has authority to access the detail record about waste collection of every company.
* **Approve and delete account:** Admin has only authority to approve and delete accounts of users and companies.
* **View registered member details:** Admin can view details of registered members.
* **Feedback and report:** User can give feedback of the service in this system and company can report a problem if it faces any problem.
* **Manage feedback and report:** Admin of the portal manage feedback of user and solved problem of company.

### 2.1.2. User Classes and Characteristics

There are five types of actors that interact with the system: User, Registered User, Company, Collector, and Administrator. Each of these actors has different purpose of using this system. That is the reason each actor has their own different requirements.

**User**

Normal users can view the contents of the system and also company information whose are registered in the system. Users can search any content about the system that they want to know. For further access users can create an account in this system.

**Registered User**

Registered Users can login and logout as they have already an account in system and also update their profile as their necessary. Registered Users have access to view collector information and call them. They can post about waste quantity and waste type which they want to give and choose preferred reward in exchange. About the service they also can give feedback and report if necessary.

**Company Representative**

Every representative from each company must have to create an account to get access in the system. They can enter and exit from system by using their username and password also update the profile of the company. Company representative can view their list of collectors and assign them for a particular or random waste exchange service. Company can post offers and rewards based on waste type and quantity. Company receives notification when other actors of the system want to interact with the company. They have authority to contact with admin and view their own records of waste exchange. Also have right to report about service.

**Collector**

Collectors can register themselves and create their own account in the system so that they can access their account through login and after getting information of work also logout. After getting the call they receive user information and send arrival time to user to collect waste and deliver rewards. Collector can report about the work experience with the system.

**Admin**

Admin can contact with company via mail, text or call and view waste collection records of each company. Admin has authority to approve account of users and companies and view the details of registered members and delete inactive members in the system. Admin also manage feedback and reports that are posted in the portal.

### 2.1.6. Assumptions

AS-1: This application will be available to user 24 hours 7 days a week.

AS-2: The application will be more user friendly to fulfill user expectations.

AS-3: Users will get the best user experiences by using the application.

AS-4: By showing relative advertisement possible to increase business.

### 2.1.7. Design and Implementation Constraints

* The information of all the users must be stored in a database that is accessible by the administrator.
* Login and password is used for the identification of sellers, buyers and customer representative.
* Limited to HTTP/HTTPS.
* The system shall not only be desktop friendly but also be mobile friendly.
* The web portal shall not contain blue text which will confuse users to be links.
* Since red and green color blindness is most common, red and green color shall not be used for important texts.
* The web portal must comply with government regulations for usage by visually impaired persons.

## 2.2. System Features

### 2.2.1. Admin Features:

* Approve account
* Manage report
* Manage Feedback
* Contact
* View waste collection records
* View registered members’ details
* Add/ Delete member

### 2.2.2. Company Representative Features:

* Create account
* Log in
* Update information
* Offer rewards/money (based on waste type and quantity)
* Post offers
* Receive notification (from user)
* View list of collectors
* View own waste collection records
* Assign collector (for collecting waste and delivering reward)
* Contact
* Report
* Log out

### 2.2.3. User Features:

* View contents
* Search offered rewards (by waste type)
* Create account

### 2.2.4. Registered User Features:

* Log in
* Update profile
* View contents
* Search offered rewards (by waste type)
* View company details
* Select waste type ( glass/ plastic/ e-waste/ paper etc)
* Add waste quantity
* Choose preferred reward ( money/ goods)
* View collector information
* Report
* Give feedback/ratings
* Contact with collector
* Log out

### 2.2.5. Collector Features:

* Create account
* Receive notification (from company)
* Send arrival time to the user
* Collect waste
* Deliver rewards
* Contact with user
* Report

## 2.3. User Requirements

**Admin:**

* As an admin I want to approve accounts, so that I can ensure the validity of the information provided during registration.
* As an admin I want to manage reports, so that I can handle any kind of system problem or user problem efficiently.
* As an admin I want to manage feedback, so that the system can be improved in future.
* As an admin I want to contact any registered members, so that I can keep them updated about different kinds of information and reply to their queries.
* As an admin I want to view waste collection records, so that I can keep track of the status and monitor the usage of the system.
* As an admin I want to view registered members’ details, so that I can see the total number of users of the system and perform user management tasks.
* As an admin I want to add/ delete any member, so that I can keep the web portal free from frauds.

**Company Representative:**

* As a company representative I want to create an account, so that I can use it to collect waste by offering rewards.
* As a company representative I want to login to the system so I can go to my profile and keep my profile protected by adding a password.
* As a company representative I want to update my information, so that I can make any changes.
* As a company representative I want to offer rewards or money based on waste type and quantity, so that I can exchange it with users.
* As a company representative I want to post offers, so that users can view it and get motivated to save waste.
* As a company representative I want to receive notification, so that I can know which user wants to exchange waste and his/her demanding reward.
* As a company representative I want to view list of collectors, so that I can know which workers of my company are working in this system and whether they are available or not.
* As a company representative I want to view my own waste collection records, so that it can be increased by taking necessary initiatives.
* As a company representative I want to assign collector, so that he can collect waste and deliver due rewards.
* As a company representative I want to contact collector or company, so that I can be updated about anything.
* As a company representative I want to report any kind of problem, so that it can be solved by the admin.
* As a company representative I want to log out, so that it can be saved from any kind of unauthorized access.

**User:**

* As a user I want to view the contents, so that I can explore the system and how it works.
* As a user I want to search for rewards, so that I can see what rewards are offered in exchange of what kind of waste.
* As a user I want to create an account, so that I can have my own profile.

**Registered user:**

* As a registered user I want to login to the system so I can go to my profile and keep my profile protected by adding a password.
* As a registered user I want to update my profile, so that I can make any changes like changing password, contact no, address etc.
* As a registered user I want to view the contents, so that I can explore the system and how it works.
* As a registered user I want to search for rewards, so that I can see what rewards are offered in exchange of what kind of waste.
* As a registered user I want to view company details, so that I can know which companies are using this system and offering what rewards.
* As a registered user I want to select waste type and quantity (glass/ plastic/ e-waste/ paper etc.), so that I can see the amount of money or offered rewards based on the waste type and quantity.
* As a registered user I want to choose preferred reward, so that the company that is offering this reward get notified.
* As a registered user I want to view collector information, so that I can know about the arrival time.
* As a registered user I want to report any kind of problem, so that it can be solved by the admin.
* As a buyer, I want to be able to give feedback of the system or seller so I can help for the betterment of the system.
* As a registered user I want to contact with collector, so that the exchange process can be held smoothly.
* As a registered user I want to log out, so that it can be saved from any kind of unauthorized access.

**Collector:**

* As a collector I want to register to the system, so that I can have my own profile.
* As a collector I want to login to my account so that I can connect with other actors of the system and my work.
* As a collector I want to receive notification from the company, so that I can be informed about user details from whom I have to collect waste and deliver due rewards.
* As a collector I want to send arrival time to the user, so that user can be aware of when I am coming.
* As a collector I want to collect waste, so that I can bring it to the company.
* As a collector I want to deliver rewards, so that users can get their preferred reward in exchange of waste.
* As a collector I want to contact with user, so that the exchange process can be held smoothly.
* As a collector I want to report any kind of problem regarding user or system, so that it can be managed by the admin.

### 2.4. Functional Requirements

Functional Requirements are those that refer to the functionality of the system.

**Admin:**

* The admin shall be able to approve account which is registered with valid information.
* The admin shall be able to manage report that is provided by any registered member.
* The admin shall be able to manage feedback provided by the user.
* The admin shall be able to contact with any member.
* The admin shall be able to view waste collection records.
* The admin shall be able to view details of all the registered members.
* The admin shall be able to add/ delete members.

**Company Representative:**

* A company representative shall be able to create account with valid information.
* A company representative shall be able to log in with required information.
* A company representative shall be able to update information if it needs.
* A company representative shall be able to offer reward or money on the basis of waste type and quantity.
* A company representative shall be able to post offers to make them available to the users.
* A company representative shall be able to receive notification from a user after he/she chooses reward that will be provided by it.
* A company representative shall be able to view its own collector list.
* A company representative shall be able to view own waste collection records.
* A company representative shall be able to assign collector for collecting waste and delivering reward.
* A company representative shall be able to contact admin via text, call or email.
* A company representative shall be able to report to the admin about any problem.
* A company representative shall be able to log out from the system to keep the account safe from any unauthorized access.

**User:**

* A user shall be able to create account with valid information.
* A user shall be able to view all types of contents available in the system.
* A user shall be able to search offered rewards according to specific waste type.

**Registered User:**

* A registered user shall be able to log in with the required information.
* A registered user shall be able to update profile if he needs.
* A registered user shall be able to view all types of contents available in the system.
* A registered user shall be able to search offered rewards according to specific waste type.
* A registered user shall be able to view all the companies’ details available in the system.
* A registered user shall be able to select waste types such as glass, plastic, paper, e-waste etc.
* A registered user shall be able to add waste quantity which he will exchange.
* A registered user shall be able to choose preferred rewards such as money or goods offered by companies.
* A registered user shall be able to view collectors’ information.
* A registered user shall be able to report any problem.
* A registered user shall be able to give feedback or ratings about the offered rewards or system performance.
* A registered user shall be able to contact with collector from whom he will get reward.
* A registered user shall be able to log out from the system.

**Collector:**

* A collector shall be able to register to the system with valid information.
* A collector shall be able to create his own account to maintain his working schedule.
* A collector shall be able to receive notification from the company to view user details and the location from where he has to collect waste and deliver due rewards.
* A collector shall be able to send his arrival time to the user.
* A collector shall be able to collect waste provided by the users.
* A collector shall be able to deliver rewards to the users.
* A collector shall be able to contact with user.
* A collector shall be able to report if he faces any kind of problem regarding this system.

## 2.5. Quality Attributes

### 2.5.1. Usability:

* Must take less than 5 minutes to fill up the registration form.
* Must take less than 1 minute to perform individual actions like login, search, select company, assigning collector etc.
* Must take maximum 20 minutes to learn about the whole system and its features.

### 2.5.2. Performance:

* Must take less than 5 seconds in case of opening windows form, of popping error messages and saving the settings.
* Must take maximum 2 seconds for method executions like opening databases, sorting, computing, posting > 95% of the files.
* When connecting to the server there is a high probability that there will be or not a successful connection that needs to be shown in less than 20 seconds for the sake of good communication.
* Maximum number of system users per time unit: 150 users per hour

### 2.5.3. Availability:

* 2 9’s (99%) = up to 87.6 hours/ 5256 minutes/ 315360.0 seconds of downtime per year.

### 2.5.4. Maintainability:

* Correctness: 100% with records.

# Chapter 3: System Design

## 3.1. Use Case Diagram

The diagram visualizes the behavior of the system. Connection between actors gives developers clear view about end users and features. Use case diagram represents what actions will be done by which actor.

|  |  |
| --- | --- |
| **Notation** | **Description** |
| UML use case | A use case is the specification of a set of actions performed by a system. |
|  | Actor and use case can be associated to indicate that the actor participates in that use case. |
|  | An actor specifies a role played by a user or any other system that interacts with the subject. |
|  | An include relationship defines that a use case contains the behavior defined in another use case. |
|  | An extend relationship specifies how the behavior of the extension use case can be inserted into the behavior defined for the base use case. |
|  | A generalization relationship is used to represent inheritance relationship between model elements of same type. |

### 

## 

## 

## 3.2. Activity Diagram

## The diagram shows the flow of control from activity to activity carried out by user, admin, collector and company. It displays how activities go on by using the system and how the system is working.

## 

### 

### 

## 3.3. Class Diagram

In software engineering, a class diagram is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

### 

## 

## 3.4. ER (Entity Relationship) Diagram

An entity relationship diagram (ERD) shows the relationships of entity sets stored in a database. An entity in this context is an object, a component of data. An entity set is a collection of similar entities. These entities can have attributes that define its properties. By defining the entities, their attributes, and showing the relationships between them, an ER diagram illustrates the logical structure of databases. ER diagrams are used to sketch out the design of a database.

### 

## 

## 

## 

## 3.5. Data Dictionary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Entity | Attribute | Type/Size | Validation | Key |
| User | UserID | Integer(06) | 300001-999999;  System generated | Primary |
| User | UserName | Text | required |  |
| User | UserContactNo | Varchar(15) | required |  |
| User | UserPassword | Varchar(10) | One special character; two upper cases; |  |
| User | UserAddress | Text | Valid Address |  |
| Company | CompanyID | Integer(06) | 100001-199999;  System generated | Primary |
| Company | CompanyName | Text | Valid Company |  |
| Company | CompanyContactNo | Varchar(15) | required |  |
| Company | CompanyPassword | Varchar(10) | One special character; two upper cases; |  |
| Company | CompanyAddress | Text | Valid Address |  |
| Admin | AdminID | Integer(02) | 01-10  System generated | Primary |
| Admin | AdminPassword | Varchar(10) | required |  |
| Collector | CollectorID | Integer(06) | 200001-299999;  System generated | Primary |
| Collector | CollectorName | Text | required |  |
| Collector | CollectorContactNo | Varchar(15) | required |  |
| Collector | CollectorLocation | Text | Valid location |  |
| CollectionList | CollectionID | Integer(10) | 00000000001- 9999999999;  System generated | Primary |
| Entity | Attribute | Type/Size | Validation | Key |
| CollectionList | WasteQuantity | Integer(05) | 00005-99999 |  |
| CollectionList | Reward | Text | required |  |
| CollectionList | CollectorID | Integer(06) | 200001-299999 | Foreign |
| CollectionList | UserID | Integer(06) | 300001-999999 | Foreign |
| CollectionList | CompanyID | Integer(06) | 100001-399999 | Foreign |

## 

## 

# 

# Chapter 4: Software Project Management Plan

## 4.1. Effort Estimation

Since this is a novel project and no historical data is available, we have estimated the source code from similar features of different web portals and assumed that the total SLOC is 5500.

Our software project type is organic because it is totally a web based system with no interaction with hardware.

According to COCOMO (Constructive Cost Model), based on SLOC characteristics,

Effort, PM = Coefficient <effort factor> \*(SLOC/1000)P

= 2.4 \* (5500/1000)1.05

= 14.37

Development Time, DM = 2.5\*(PM)T

= 2.5\*(14.37)0.38

= 6.88 months

Required number of people, ST = PM/DM

= 14.37/6.88

= 2.08 = 3 people

PM **:** person-months needed for project (labor working hours)

SLOC **:** source lines of code

P **:** project complexity (1.04-1.24)

DM **:** duration time in months for project (week days)

T **:** SLOC-dependent coefficient (0.32-0.38)

ST **:** average staffing necessary

## 4.2. Work Breakdown Structure

## 

## 

## 

## 4.3. Activity Planning

### 4.3.1. Sequencing and Scheduling Activities

## 

### 4.3.2. Network Model

## 

## 

## 

## In the above network model the critical paths are A-B-G-H-I-K-L and A-B-G-H-J-K-L. Critical path is a sequence of critical tasks/activities and is the largest path in the project network. It gives us the minimum time which is required to complete the whole project. The activities in the critical path are known as critical activities and if these activities are delayed then the completion of the whole project is also delayed.

## 4.4. Resource Analysis

1. Staff : from effort estimation it was known that 3 staff is required in this project
2. Equipment : Workstations, computing devices, office equipment
3. Space : office space
4. Services : telecommunication service, internet service
5. Money : money is a secondary resource to buy equipment, give space rent, give service bills, give staff salary

* Staff, Equipment, Space, and Services are needed throughout the project.
* Money is needed in the beginning of every month.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 3 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 1 |  |  |  |  |  |  |
| Staff required **/**months | 1  Requirement  elicitation | 2Designing | 3Coding | 4Testing | 5Debugging | 6VerificationValidation |

### 

### **Burman’s priority list:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Priority | Activity | Activity Label | Duration | Float |
| 1 | Identify needs and benefits | A | 2 | 0 |
|  | Define application components | B | 2 | 0 |
| 2 | Design UML diagrams | G | 3 | 0 |
|  | Design GUI of the application | H | 3 | 0 |
| 3 | Building the code | I | 4 | 0 |
|  | Making the GUI | J | 4 | 0 |
|  | Verification | L | 4 | 0 |
| 4 | Software testing | K | 6 | 0 |
| 5 | Research existing applications | C | 2 | 1 |
|  | Define project feasibility | D | 2 | 1 |
|  | Make effort estimation | E | 2 | 1 |
| 6 | Create scope definition | F | 3 | 1 |

### 

### 2.1.3. Hardware and Software Requirements

#### Below is a list of the minimum Hardware and Software requirements to Waste Exchange System.

**Hardware:**

* Processor (CPU) with 2 gigahertz (GHz) frequency or above
* A minimum of 2 GB of RAM
* Monitor Resolution 1024 X 768 or higher
* A minimum of 20 GB of available space on the hard disk
* Internet Connection Broadband (high-speed) Internet connection with a speed of 4 Mbps or higher
* Keyboard and a Microsoft Mouse or compatible pointing device

**Software:**

* GPS-- For tracking the place.
* Real Player-- For audio/video contact.
* My SQL -- For store all the data.

**Browsers:**

* Chrome\* 36+
* Edge\* 20+
* Mozilla Firefox 31+
* Internet Explorer 11+ (Windows only)
* Safari 6+ (MacOS only)

**Browser Configuration:**

Browser must be configured as follows:

* JavaScript must be enabled
* Cookies must be enabled.
* Pop-up windows must be enabled.

**Operating System:**

* Windows 7, Windows 8 or Windows 10
* Mac OSX 10.8, 10.9, 10.10 or 10.11

### 2.1.4. Human Resource Requirements

* Project Manager (PM), (1 position)
* Design Engineer (DE), (1 position)
* Implementation Manager (IM) (1 position)
* Functional Managers (FM), (1 position)

### 2.1.5. Operating Environment

Operating environment for the Waste Exchange System is as listed below.

* Distributed database
* Client/Server System
* Operating system: Windows, Mac
* Database: MySQL
* Platform: HTML, CSS, JavaScript, PHP

## 4.5. Risk Analysis

### Risk Table:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Risk** | **Category** | **Probability** | **Impact** | **RMMM** |
| 1. Team not Experienced | Staff size and experience  (ST) | 40% | 2 | Employ the best people; team formation; training; job matching; early scheduling of key personnel |
| 2. Size estimated may be significantly low | Product Size (PS) | 80% | 2 | Function point analysis;  effort estimation; features analysis. |
| 3. Requirements and developed functions will not match | Process Definition (PR) | 20% | 1 | User involvement; task analysis; application description in early phases. |
| 4. User interfaces will not fit needs | Customer Characteristics  (CU) | 10% | 3 | Prototyping; development of scenarios; description of users. |
| 5. Unrealistic schedule and budget | Development Environment  (DE) | 30% | 2 | Multiple estimation techniques; design to cost; incremental development; recording and analysis of past projects |
| 6. Customer may fail to participate | Customer Characteristics  (CU) | 40% | 1 | Ensuring user friendly interface and reliability of the system. |
| 7. Insufficient resources | Development Environment  (DE) | 40% | 1 | Proper resource analysis and allocation. |
| 8. Inadequate staff available from external stakeholders | Staff size and experience  (ST) | 80% | 4 | Identifying stakeholders correctly; maintaining proper communication; keeping them up to date about every single task. |
| 9. Lack of training on tools | Development Environment  (DE) | 20% | 3 | Using common tools; assigning domain expert for training and supervising. |
| 10. Inadequate architecture, performance, quality | Business Impact (BU) | 15% | 2 | Modeling; prototyping. |

RMMM = Risk Mitigation, Monitoring and Management Plan

Impact Values:

1 - Catastrophic

2 - Critical

3 - Marginal

4 - Negligible

# 

# Chapter 5: Software Test Plan

5.1. Functional Requirement test case:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:** Waste Exchange System | | | **Test Designed by:** Ahmed, Sinthia | | |
| **Test Case ID:** FR\_1 | | | **Test Designed date:** 25.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** Account confirmation | | | **Test Execution date:** TBA | | |
| **Test Title:** Admin confirming users successfully | | | | | |
| **Description:** test if the admin can successfully confirm users and upload there information into the database | | | | | |
| **Precondition:** users will fill up every required information before doing registration.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| **1.**Go to admin’s account  **2.**View registration request  **3.**Click confirm button  **4.**Check database |  | User should be confirmed and user’s information should be inserted into the database | |  |  |
| **Post Condition:** will check if the user is already registered or not. If not registered than information  will insert into database, if already registered there will be an email sent to the user. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:**  Islam, Lamia | | |
| **Test Case ID:**  FR\_10 | | | **Test Designed date:** 26.11.2019 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** update information | | | **Test Execution date:** TBA | | |
| **Test Title:** add, delete, edit or change information as per wish within the requirements | | | | | |
| **Description:**test if the user can change any information in order to update his/her profile. | | | | | |
| **Precondition:** An existing user has to enter his/her current password correctly.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| **1.**  Go to update profile,  **2.**  Edit the particular text fields,  **3.**  Click the update button. | Name: Sadia  Email: st@gmail.com  Address: 12/1 Dhaka.  Current Password: \*\*\*\*\*  New Password: \*\*\*\*\* | User information updated successfully. | |  |  |
| **Post Condition:** Confirmation messages will be displayed before performing any update operation. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:** Islam, Lamia | | |
| **Test Case ID:**  FR\_21 | | | **Test Designed date:** 30.11.2019 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** login verification | | | **Test Execution date:** TBA | | |
| **Test Title:** redirecting to the particular user’s profile. | | | | | |
| **Description:** test if the user can go to his/her profile with valid information. | | | | | |
| **Precondition:** User has valid email and password.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| 1. Go to login page, 2. Fill up required text fields, 3. Click the login button. | Email: sazida@gmail.com  Password: \*\*\*\* | User will be able to access his/her own profile. | |  |  |
| **Post Condition:** A pop up error message will be generated if the given information does not match with the database. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:**  Ahmed, Sinthia | | |
| **Test Case ID:**  FR\_24 | | | **Test Designed date:** 27.11.2019 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** search operation | | | **Test Execution date:** TBA | | |
| **Test Title:** proper outcome of search operation. | | | | | |
| **Description:** Verify that filtering works correctly on the search result page | | | | | |
| **Precondition:** a user should enter queries in the search box.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| 1. Go to home page, 2. Enter category, 3. Click the search button. |  | Show products that belong to mentioned category correctly. | |  |  |
| **Post Condition:** Search result will be unavailable if product not found under the given category. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:** Islam, Lamia | | |
| **Test Case ID:** FR\_35 | | | **Test Designed date:** 26.11.2019 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** sign up verification | | | **Test Execution date:** TBA | | |
| **Test Title:** Verification of minimum requirements for signing up | | | | | |
| **Description:** test that entering blank spaces or not filling the mandatory fields and clicking submit button will lead to error. | | | | | |
| **Precondition:** User leaves a required field empty while filling up the registration form.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| 1. Go to sign up page, 2. Fill up text fields, 3. Click sign up button. | Name: Sadia  Email:  Password: \*\*\*\*  DOB: 05.07.92 | User will not be able to sign up to the system. | |  |  |
| **Post Condition:** An error message will be generated about filling up the required fields first. If all of them are filled up correctly, then user account will be created successfully. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:**  Ahmed, Sinthia | | |
| **Test Case ID:**  FR\_42 | | | **Test Designed date:** 27.11.2019 | | |
| **Test Priority(Low, Medium, High):**High | | | **Test Executed by:** TBA | | |
| **Module Name:** Functioning of Reset Button | | | **Test Execution date:** TBA | | |
| **Test Title:** Proper functioning of the reset button completing its prior fields | | | | | |
| **Description:** Verify that clicking reset button after entering all the required fields, cancels the submit request and resets all the fields | | | | | |
| **Precondition:** The text fields should be fulfilled before using the reset button  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| 1. Go to sign up page, 2. Fill up text fields, 3. Click the reset button. |  | All text fields are cleared. | |  |  |
| **Post Condition:** No new user information will be inserted into the database. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:**  Ahmed, Sinthia | | |
| **Test Case ID:**  FR\_43 | | | **Test Designed date:** 27.11.2019 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** redirection operation | | | **Test Execution date:** TBA | | |
| **Test Title:** redirecting to the particular destinations to which those are intialized | | | | | |
| **Description:**Verify that all the links and buttons are redirecting to correct places and none of the links are broken. | | | | | |
| **Precondition:** A user will have to click on the links or buttons for reaching its destination.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| **1.**  Click buttons,  **2.**  Click Links. |  | Navigate to the correct location. | |  |  |
| **Post Condition:**An error message will be displayed to the user if any page is not available. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:**  Islam, Lamia | | |
| **Test Case ID:**  FR\_44 | | | **Test Designed date:** 26.11.2019 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** email and date verification | | | **Test Execution date:** TBA | | |
| **Test Title:** Verifying email and date by checking the validity of the entered inputs | | | | | |
| **Description:** test if error occurs while providing invalid date or email fields | | | | | |
| **Precondition:** user will enter invalid email address and date.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| 1. Go to sign up page, 2. Fill up email address, 3. Click sign up button. | Email: abcaasp  DOB: 05/05/2022 | Sign up failed. | |  |  |
| **Post Condition:** A pop up message will be generated about invalid email address and date. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:**  Ahmed, Sinthia | | |
| **Test Case ID:** FR\_45 | | | **Test Designed date:** 27.11.2019 | | |
| **Test Priority(Low, Medium, High):** Medium | | | **Test Executed by:** TBA | | |
| **Module Name:** password verification | | | **Test Execution date:** TBA | | |
| **Test Title:** Verifying password by checking its minimum requirements | | | | | |
| **Description:** Test if a password has a length of minimum 6 characters and contains both alphabetic and numeric values. | | | | | |
| **Precondition:** User will go to the sign up form at first.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| 1. Enter password, 2. Click sign up button. | Password: abcd | Sign up failed. | |  |  |
| **Post Condition:** User will be informed about entering wrong input and will be asked for entering at least 6 characters with one or more numeric values. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:** Waste Exchange System | | | **Test Designed by:**  Islam, Lamia | | |
| **Test Case ID:** FR\_46 | | | **Test Designed date:** 26.11.2019 | | |
| **Test Priority(Low, Medium, High):** Low | | | **Test Executed by:** TBA | | |
| **Module Name:** upper limit verification | | | **Test Execution date:** TBA | | |
| **Test Title:**verification of the upper limit value based on its given number of inputs. | | | | | |
| **Description:** test the upper limit of the textboxes with its boundary value. | | | | | |
| **Precondition:** A user should fill a text field of the system.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| 1. Fill up text fields. 2. Click button. | Name: aaaaaabbbbbbbbbbbbbcc  Ddddddddddddddddddeee  Ffffffffffffffffffffffffffffffffffffff | Invalid name. | |  |  |
| **Post Condition:** A message will be shown that input cannot be more than 30 characters. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:** Waste Exchange System | | | **Test Designed by:** Ahmed, Sinthia | | |
| **Test Case ID:**  FR\_47 | | | **Test Designed date:** 27.11.2019 | | |
| **Test Priority(Low, Medium, High):** Low | | | **Test Executed by:** TBA | | |
| **Module Name:** text field verification | | | **Test Execution date:** TBA | | |
| **Test Title:** Verification of the text field value based on its given inputs. | | | | | |
| **Description:** Verify alphabetic fields by entering numbers and special characters. | | | | | |
| **Precondition:** A user should fill a text field of the system.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| 1. Fill up text fields, 2. Click button. | First Name: a#bc@2 | Invalid name. | |  |  |
| **Post Condition:** a message will be shown that input cannot contain special characters or numbers. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:** Waste Exchange System | | | **Test Designed by:** Ahmed, Sinthia | | |
| **Test Case ID:** FR\_49 | | | **Test Designed date:** 27.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** Calculation of waste amount | | | **Test Execution date:** TBA | | |
| **Test Title:** calculation of waste amount based on waste quantity | | | | | |
| **Description:** test if amount shown based on quantity is correct and rewards shown based on that amount | | | | | |
| **Precondition:** companies need to set amount for a certain type of waste  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status(Pass/Fail)** |
| **1.**Select waste type  **2.**Enter waste quantity  **3.**Specify waste type  **4.**Click count button  **5.**Check shown rewards | Waste type: plastic  Quantity: 5  Specification: bottle, 5ml | Amount should be correct and rewards shown valid  (if company sets plastic bottles 10tk  Amount :5\*10 = 50) | |  |  |
| **Post Condition:** rewards shown are according to the amount. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:**  Islam, Lamia | | |
| **Test Case ID:** FR\_50 | | | **Test Designed date:** 26.11.2019 | | |
| **Test Priority(Low, Medium, High):** Medium | | | **Test Executed by:** TBA | | |
| **Module Name:** image verification | | | **Test Execution date:** TBA | | |
| **Test Title:** Verification of the image by its proper file size and type. | | | | | |
| **Description:** Test if image size is greater than the max-allowed size or with wrong file types. | | | | | |
| **Precondition:** A user should login and select an image field.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| 1. Go to post offer page, 2. Choose image, 3. Click upload button. | Image.jpeg | Image uploaded successfully. | |  |  |
| **Post Condition:** A proper error message should be displayed for uploading large file size and file types like .txt, .doc, .pdf etc. | | | | | |

5.2. Non-Functional Requirement test case:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:** Islam, Lamia | | |
| **Test Case ID:** N-FR\_2a | | | **Test Designed date:** 27.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:**TBA | | |
| **Module Name:** Execution time check for login | | | **Test Execution date:**TBA | | |
| **Test Title:** lowest time for execution of login action | | | | | |
| **Description:** test if users can login the system within 1 minute | | | | | |
| **Precondition**: users will click the login button  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| **1.**      Go to login page,  **2.**      Fill up all requirements fields  **3.**      Click login button | Email:  sadia@gmail.com  Password: \*\*\*\* | Users will be able to go to their profile page within 1 minute | |  |  |
| **Post Condition:** After login, user will be able to access his/her own profile. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:** Islam, Lamia | | |
| **Test Case ID: N-**FR\_2b | | | **Test Designed date:** 27.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:**TBA | | |
| **Module Name:** Execution time check for search | | | **Test Execution date:**TBA | | |
| **Test Title:** lowest time for execution of search action | | | | | |
| **Description:** verify that searched results are viewed within 1 minute | | | | | |
| **Precondition**: users will click the search button  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status(Pass/Fail)** |
| **1.**      Go to home page,  **2.**      Enter category,  **3.**      Click the search button | Search: e-waste | Show products according to the category within 1 minute. | |  |  |
| **Post Condition:** A list of suggested products are displayed within 1 minute. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:** Islam, Lamia | | |
| **Test Case ID: N-**FR\_2c | | | **Test Designed date:** 27.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:**TBA | | |
| **Module Name:** Execution time check for company selection | | | **Test Execution date:**TBA | | |
| **Test Title:** lowest time for execution of select company action | | | | | |
| **Description:** verify that user can select company within 1 minute | | | | | |
| **Precondition**: users will click the select button  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status(Pass/Fail)** |
| **1.**      Go to profile,  **2.**  Click the select button |  | User can select a company from the company list within 1 minute. | |  |  |
| **Post Condition:** The selected company’s profile will be viewed within 1 minute. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:** Islam,Lamia | | |
| **Test Case ID: N-**FR\_2d | | | **Test Designed date:** 27.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:**TBA | | |
| **Module Name:** Execution time check for assigning collector. | | | **Test Execution date:**TBA | | |
| **Test Title:** lowest time for execution of collector assignment action. | | | | | |
| **Description:** verify that a company can assign collectors within 1 minute. | | | | | |
| **Precondition**: Companies will login their profiles  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status(Pass/Fail)** |
| **1.**      Go to company’s profile.  **2.**  View the collectors list.  **3.** View collectors’ profile.  **3.** Assign collectors. |  | A Company can assign collector from the collector list within 1 minute. | |  |  |
| **Post Condition:** Collector will receive notification. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:** Islam, Lamia | | |
| **Test Case ID:** N-FR\_3 | | | **Test Designed date:** 27.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:**TBA | | |
| **Module Name:** System execution time check | | | **Test Execution date:**TBA | | |
| **Test Title:** lowest time for execution of the whole system | | | | | |
| **Description:** test if any user can learn the features of the whole system within 20 minutes | | | | | |
| **Precondition:**users will start the application  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status(Pass/Fail)** |
| **1.**Go to the webpage |  | Users will be able to learn the whole system within 20 minutes | |  |  |
| **Post Condition:** Users’ queries are satisfied. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:** Waste Exchange System | | | **Test Designed by:** Ahmed, Sinthia | | |
| **Test Case ID:** N-FR\_5 | | | **Test Designed date:** 27.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** Performance Check | | | **Test Execution date:** TBA | | |
| **Test Title:** Lowest time for application to start | | | | | |
| **Description:** test if the application starts in less than 5 seconds | | | | | |
| **Precondition:** users will start the application  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| **1.**Click on the application logo  **2.**Check time for it to open |  | Application should start in less than 5 secs | |  |  |
| **Post Condition:** If the application does not start within 5 secs, need to solve the problem. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:** Waste Exchange System | | | **Test Designed by:** Ahmed, Sinthia | | |
| **Test Case ID:** N-FR\_6 | | | **Test Designed date:** 28.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** Execution time check for posting offer | | | **Test Execution date:** TBA | | |
| **Test Title:** Minimum execution time for sorting, computing data and posting offers. | | | | | |
| **Description:** verify that a company can post reward offers within 5 seconds. | | | | | |
| **Precondition**: Companies will login their profiles.  **Dependencies:** The waste collection records must be shown. | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status(Pass/Fail)** |
| **1.** Go to the application homepage.  2**.** View the users list.  3. View the waste collection information  4**.** Write a reward post for the targeted users.  **3.** Click the post button. |  | Company representative can view his or her own post posted on the homepage within 5 seconds. | |  |  |
| **Post Condition:** Users can view company’s reward posts. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:** Waste Exchange System | | | **Test Designed by:** Ahmed, Sinthia | | |
| **Test Case ID:** N-FR\_7 | | | **Test Designed date:** 27.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:** TBA | | |
| **Module Name:** Server Connection | | | **Test Execution date:** TBA | | |
| **Test Title:** server connection without interruption | | | | | |
| **Description:** test if the application is connected to the server without any interruption 24/7 | | | | | |
| **Precondition:** correct line of code for connecting to the server.  **Dependencies:** server service always available | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status(Pass/Fail)** |
| **1.** ping application from Client side to Server side |  | Server should always be available | |  |  |
| **Post Condition:** if server found down or unavailable need to fix problem. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:** Waste Exchange System | | | **Test Designed by:** Ahmed Sinthia | | |
| **Test Case ID:** N-FR\_8 | | | **Test Designed date:** 28.11.19 | | |
| **Test Priority(Low, Medium, High):** Medium | | | **Test Executed by:** TBA | | |
| **Module Name:** page load checking session | | | **Test Execution date:** TBA | | |
| **Test Title:** Check load capacity. | | | | | |
| **Description:** Test if the application can take load of 150 user requests per hour and large input of data simultaneously. | | | | | |
| **Precondition**:  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status (Pass/Fail)** |
| 1. Go to the webpage. |  | Simultaneous user requests (up to 150 users) will be handled without any disruption. | |  |  |
| **Post Condition:** The system will load without interruption. | | | | | |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Project Name:**  Waste Exchange System | | | **Test Designed by:** Ahmed, Sinthia | | |
| **Test Case ID:** N-FR\_9 | | | **Test Designed date:** 28.11.19 | | |
| **Test Priority(Low, Medium, High):** High | | | **Test Executed by:**TBA | | |
| **Module Name:** Downtime check | | | **Test Execution date:**TBA | | |
| **Test Title:** lowest possible downtime of the application. | | | | | |
| **Description:** test if the total downtime of the webpage is up to 5256 minutes per year. | | | | | |
| **Precondition:**Full time running of the application.  **Dependencies:** | | | | | |
| **Test Steps** | **Test Data** | **Expected Results** | | **Actual Results** | **Status(Pass/Fail)** |
| 1.Run the web application for 24 hours (86,400 seconds).  2. Take the number of seconds the application was down.  3. Divide it by the total number of seconds the application was being monitored.  4. Calculate the percentage. |  | The application will not be down more than 1% time of the year. | |  |  |
| **Post Condition:** If application was found down or unavailable more than 1% need to fix problem. | | | | | |

**REFERENCES**

1. OMG. “Unified Modeling Language Specification”, Superstructure Version 2.1.1, Feb. 2007.

2. Roger S. Pressman, “Software Engineering: A Practitioner’s Approach”, McGraw-Hill

Education, 8th edition, Jan. 2014.

3. K. Wiegers and J. Beatty, “Software Requirements”, Microsoft Press, 3rd Edition, Aug. 2013.

4. “The Waste Exchange (WEX)”, Waste Exchange Ltd, 2018. [Available:

https://www.thewasteexchange.uk/ ]

5. “SANSHODHAN: AN E-WASTE EXCHANGE (EWX)”, Sanshodhan:An E-Waste

Exchange Pvt Ltd., 2016. [Available: https://www.e-wasteexchange.com/ ]

6. “KleanLoop A Decentralized Blockchain DApp For Creating Transparency In Tyre And Plastic Recycling”, Cision PR Newswire, Sep. 15, 2019. [Available:

https://www.prnewswire.com/news-releases/kleanloop-a-decentralized-blockchain-dapp-

for-creating-transparency-in-tyre-and-plastic-recycling-300918319.html]