

Leftover Food Management and Donation Application
(A progressive web app)

BY

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

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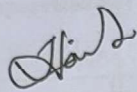
DAFFODIL INTERNATIONAL UNIVERSITY
DHAKA, BANGLADESH
AUGUST 2023

APPROVAL

This Project titled **Leftover Food Management and Donation Application (A progressive web app)**, submitted by **Md. Minhazul Alam, ID No: 192-15-2877** to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on *Wednesday, 2nd August 2023.*

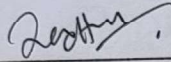
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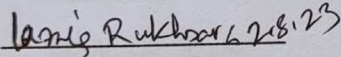
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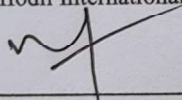
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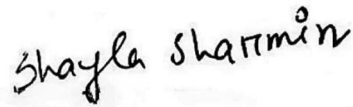


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DECLARATION

I hereby declare that, this project has been done by me under the supervision of **Shayla Sharmin, Sr Lecturer, Department of CSE** Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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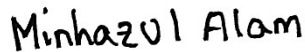
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ACKNOWLEDGEMENT

First, I express our heartiest thanks and gratefulness to almighty God for Her divine blessing makes us possible to complete the final year project successfully.

I really grateful and wish our profound our indebtedness to **Shayla Sharmin, Sr Lecturer**, Department of CSE Daffodil International University, Dhaka. Deep Knowledge & keen interest of my supervisor in the field of “*Web Development*” to carry out this project. Her endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stage have made it possible to complete this project.

I would like to express our heartiest gratitude to Professor **Dr. Touhid Bhuiyan, Professor & Head**, Department of CSE, for his kind help to finish my project and also to other faculty member and the staff of CSE department of Daffodil International University.

I would like to thank my entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, I must acknowledge with due respect the constant support and patients of our parents.

ABSTRACT

In today's society, eliminating food waste through utilizing accessible food supplies within local communities, such as leftover food from weddings, restaurants, and food distribution centers, is an important goal. That may be nearing expiration; and any consumables are not used during the scheduled period. According to research about 25% food from weddings, parties, restaurant and household are being wasted. Many people's problems can be solved if these wasteful foods are distributed properly. In this situation, I am attempting to solve the problem by developing a platform that would connect people to organizations who receives leftover food and distributes to people those who in need. Not only food, but using this platform, people can donate other things like clothes, stationery, funds, and many more criteria easily. This website will encourage people to donate. In this website user can donate leftover food by using real time location, and other criteria and also have a payment method. People can also join our volunteer team. To donate food user needs to visit website and turn on location it will show the organizations near donors' area, select the desired organization and place request. To make another donation, they must fill out a form, choose an amount, and then pay. Because of the variety of payment methods available, users can easily make a donation.

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CHAPTER 1

Introduction

1.1 Introduction

Any type of business can work more quickly and easily by using a website. My project is primarily an online platform for connecting individuals who wants to donate to the organizations which receives donation [1]. This website has different donation categories, but it gives first priority to the leftover food from weddings, parties, restaurants and also household. Wedding food waste is reported to be 25% of the available amount of rich food [2].

Food is a significant energy-demanding product group and resource. After all, every restaurant has perfectly good food that it cannot sell. A considerable percentage of this food gets thrown away at the dumping zone. How can this food be used to properly satisfy someone's hunger [3]? What if there existed a platform that used one's current location to connect people to organizations who collected leftover food? Not only food this platform has different donation categories for example, clothes, stationery, fund and many more.

NGO or organizations have to register in the website which creates username, location, hotline number, and respective passwords from which they can easily access the application. Admin will approve and it will show to the user's map. In terms of donating leftover food user will visit website in the map section, allowing live location they will be able to see the organization available near them which receives leftover food.

In another category donation user needs to visit website and can donate accordingly. This website is very user friendly no complicated registration or account creating with personal information is required. There is no easier or more reliable system to use. From start to finish, it's a smooth, automated system that helps to donate surplus food and collect funds. Donating charity online has become commonplace, with dozens of donating sites dispersed around the internet [4]. Most of these giving websites are designed to allow all types of donors to quickly and easily locate deserving charities to support by just clicking and utilizing" their credit cards, giving sites aggregate many charities in one place so that a potential donor does not have to move around looking for individual charitable sites."

To make this project, I have studied about existing system I've also researched food waste and shortage around the world, particularly in Bangladesh. By working on this project, I learned JavaScript, Reactjs, Mongoddb, XML, Firebase Authentication, and Real-time Database.

1.2 Motivation

Waste of unfinished meals is one of the major problems impacting food globally. Not an exception is Bangladesh [5]. The avoidable waste of food at parties and weddings has become a major financial and environmental issue for most researchers, politicians, governments, and the media as a result of the hospitality industry's constant growth and the rising social fashion of eating out frequently. It is surprising that more than one-third of the food produced worldwide is wasted. (Nixon, 2015) Three billion lots, or \$400 billion annually [6]. According to Shams et al. (2017) [7], Bangladesh has the terrible record of having 68.3–81. 1% of its municipal strong waste consist of food waste. However, if properly managed, the misused leftover food can provide a reliable source for the creation of clean energy. According to various types of study, about 40% of the meals prepared at a wedding site are wasted and thrown away after the marriage ends. For the benefit of the environment and society, it is crucial to take urgent action to eliminate food waste in Bangladesh and elsewhere.

Many humans' preference to make contributions meals, however cannot find the ideal channel. Basically, my number one intention is to feed hungry people. The majority of people in recent times utilize a smart system with an energetic internet connection [8]. That is why I took into consideration how donors may additionally simply donate their excess

meals to the needy [9]. Then I expand an internet site where participants can donate food and we can try and feed the hungry.



Figure 1.1: Leftover excess food from wedding [10].

1.3 Objectives:

- The project's main goal is to eliminate food waste from weddings, parties, and convention centers through donation.
- Establishment of digital communication between user with the government and non-governmental organizations.
- Easy for people to work as a volunteer in charity organizations.
- Built in address line using users live location.
- Different types of donating categories.
- Easy international card payment system.
- Secure easy transaction.
- User friendly design.



Figure 1.2: Benevolent people helping those who are in need [11].

1.4 Learning Outcomes

From this project: A website that will help people share food, donate fund, clothes, stationery, and may more in one place. User friendly website digital communication between user and organizations using live location.

Personal Expectations: I want to be a professional web developer. By developing and refining abilities, building confidence, and stepping into a job, I can get useful work experience and explore a career route [12].

1.5 Layout of the Report

This section describes layout of the report [13].

- Chapter 1 has an introductory discussion about the project's zeal, aim and future outcomes of the project.
- Chapter 2 shows us the problems and challenges of managing food waste in Bangladesh and existing works related to it.
- Chapter 3 shows us the functional requirements of our website in use case and class diagrams.
- Chapter 4 shows us about my project's front-end, back-end designs.
- Chapter 5 shows execution and testing.
- Chapter 6 tells us about the conclusion and future developments.
- Chapter 7 has references.

CHAPTER 2

BACKGROUND STUDY

2.1 Preliminaries/Terminologies

Before beginning any project, it is critical to conduct research on the project's benefits and drawbacks to ensure the project's long-term viability. I need to see whether there are any existing or similar works that have been completed or are in the works. To make my project the best it can be for society, I need to uncover flaws and missing features in those works. This chapter explore those points.

2.2 Related Works:

Background research is conducted to learn about current websites, identify their flaws, and improve one's own website. However, I am terribly disappointed that no website has been established as of yet. This is Bangladesh's first share-request website. Some non-governmental organizations and internet stores have processes that are comparable to ours. Some non-governmental organizations (NGOs) also work for three times a day meal for the poor, which is one of our goals. This website is not for business purpose. This website exists to benefit humanity. As a result, I may work with non-profit organizations and online retailers to provide volunteer and rider support during the delivery process.

One Taka Meal

One Taka Meal is a charitable initiative in Bangladesh that provides affordable and nutritious meals to combat hunger and food insecurity. By offering complete meals for just one taka, the initiative aims to ensure access to nourishment for all, particularly those facing economic challenges. Through partnerships and community support, One Taka Meal strives to make a positive impact on disadvantaged communities and promote a hunger-free Bangladesh. [14].

Meals for All Bangladesh.

Meals for All Bangladesh is a charitable organization dedicated to providing meals to individuals and communities in need. They work to address food insecurity by collecting and distributing food to vulnerable populations, including the homeless, impoverished families, and those affected by emergencies or natural disasters. Meals for All Bangladesh strives to ensure that everyone has access to nutritious meals, promoting food security and well-being throughout the country. [15].

Food panda Bangladesh

It is a platform for meal delivery in Bangladesh that sends consumers food and groceries from restaurants. They recently started a project with bidyanondo to cut down on food waste. However, at this location, the needy only receive orders that Food Panda has canceled. This process takes a while because food is first canceled, then given to bidyanondo, and finally distributed to the poor. [16].

Action Aid

A worldwide non-governmental organization (NGO) called ActionAid is committed to eradicating poverty and injustice on a global scale. ActionAid was established in 1972 and collaborates with regional groups, activists, and communities to support and promote human rights, gender equality, and sustainable development. The group works in many nations to combat problems like poverty, inequality, violence against women, climate change, and the defense of human rights. In order to strengthen marginalized groups, advance social justice, and bring about long-lasting change in the lives of vulnerable communities, ActionAid executes a variety of programs and campaigns. [17].

Jagoo Foundation

The Jagoo Foundation is a nonprofit with a presence in Bangladesh that prioritizes community and educational development. Their main goal is to give disadvantaged children and youth access to high-quality education and all-around support in order to empower them. To guarantee educational possibilities for persons living in underserved communities, the foundation may set up schools, learning centers, and scholarship

programs. The Jagoo Foundation works to improve communities, end the cycle of poverty, and build a better future for Bangladesh's children and young people. [18].

Chaldal Food Aid

Chaldal is a well-known online grocery delivery platform in Bangladesh. A shopping platform where needs for household, fresh meat and vegetables and a lots of grocery items are available. They picked the products from different seller and keeps in their store house [19].

Food Bank Network Bangladesh.

The Food Bank Network Bangladesh is committed to addressing hunger and food waste by efficiently managing surplus food and distributing it to those in need. By engaging with various stakeholders and raising awareness, FBNB plays a vital role in fighting food insecurity in Bangladesh. For the most up-to-date information and detailed insights into their work. FBNB collaborates with various donors, including restaurants, hotels, corporate entities, and individuals, to collect surplus food that would otherwise go to waste. This food is carefully examined for quality and safety [20].

Bidyanondo Foundation:

Bidyanondo's primary mission is to ensure education and basic services for disadvantaged children and communities. The organization focuses on improving access to education, healthcare, nutrition, and other essential needs. The organization may run feeding programs, provide food supplies, or distribute nutritious meals to children suffering from malnutrition [21].

2.3 Problem statement

Food waste makes up an awful 68.3 to 81.1% of municipal solid trash in Bangladesh [22]. However, properly handled leftover food can be a sustainable source for the creation of renewable energy. According to various studies, around 40% of the food provided at a wedding site is wasted and thrown away after the ceremony. For the sake of the environment and society, it is imperative to take prompt action in Bangladesh and elsewhere to eliminate food waste. [23].

Wastage has been ignored in our country. Food waste is common in restaurants, weddings, and even households. People in one place waste food, while others cannot afford a basic three-meal-a-day diet. They are malnourished. Poor individuals will sometimes eat food from waste areas. Meritorious students do not receive study materials. Bangladesh has 24.4 million undernourished individuals, accounting for 15.1% of the population. Many people aid the needy by giving them money, food, and clothes, but this is not sustainable [24]. Every day, a job holder is unable to contribute food to those living on the streets. It is not a sustainable procedure.



(left) table full of foods [33]. (right) On the other side children's not getting enough food [34].

2.4 Challenges

- To reduce the percentage of food waste.
- Making donation easy.
- Different types of donation category.
- Logistics support.
- Easy connection between user and organizations.
- To run this initiative in entire Bangladesh
- Publishing and getting it started as a brand new and unique application.

2.5 Feasibility Study

A feasibility study determines if a project is feasible. By identifying the project's strengths and weaknesses, possibilities and hazards in the actual world, and the resources needed to carry out the project's final possibilities for success, the feasibility study seeks to solve the mystery of the project. In simple words, the expense necessary and the value are the two variables used to determine feasibility. A well-designed feasibility study includes the project's historical context, An overview of the service, financial information, legal requirements, accounting statements, and marketing research. The chance of the project's success is evaluated by the feasibility study. In order to convey information from which decisions can be made, it must be constructed with an objective, unbiased methodology. Any development process will be significantly impacted by this kind of analysis. Because it prompts a study into a number of factors, including the cost of planning and carrying out the experiment as well as the amount of time needed for each system period. If the pertinent criteria are not fully investigated, a fatal mistake may arise, rendering the system utterly useless. Because of this, conducting this research is essential to creating a system.

- **Technical feasibility:**
The analysis is used to identify whether the developer has the abilities required to finish the project and is based on a preliminary model of a design of required system.

➤ Legal feasibility:

It determines if the proposed enterprise is permissible under local regulations, whether a processed data system must abide by local data protection legislation, and whether the intended system conflicts with legal requirements.

➤ Time feasibility:

A time feasibility study will look into how long it will take to execute the project. The project will be considered unsuccessful if it takes too long to finish. In general, this is figuring out how long the system will take to develop and whether it can be created using specific approaches in a set amount of time. The project's timetable's viability is evaluated using its timeliness. Can we meet the project deadlines with our technological capabilities? Some projects are launched with specific completion dates in mind. It is crucial to ascertain whether the project can be completed within the allotted time range.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Requirement Collection and Analysis

Analysis of project requirements is regarded as being of the highest priority. It represents the foundation of a project. The development expenses will be expensive if the criteria are not clear and the results are poor. Because this type of website is the first in Bangladesh, it was more difficult in my instance. In order to gather requirements, I asked ourselves questions and looked for answers. By speaking with my supervisors, and even impoverished individuals, I also attempted to discover a solution. I considered how to make the system practical for users. I have also considered potential outcomes. As part of my project, I displayed many diagrams. For that, we used Draw.io.

The specifications, resources, and technologies needed to finish the suggested system will all be covered in this chapter. The use case diagram, description, and other requirements are covered in this chapter.

3.2 Functional Requirements

User:

1. User can share their leftover food by just turning on device live location.
2. User can share their leftover food by details submission. Details included picture of food, cooked time and date, name, address and mobile number.
3. User can donate in different categories: clothes, food, funds, stationery, and medical.
4. User can chat and know information from chatbot.
5. User can instantly donate money Identically or anonymously via payment gateway.
6. User can search about NGO details, Information provided by Bangladesh Government.

Volunteer:

1. Volunteer can register and login.
2. Volunteer can edit profile.
3. Volunteer can see request and accept.
4. Volunteer can edit their profile.

Admin:

1. Admin login.
2. Admin can see number of users, volunteers and their name and email.
3. Admin can see pending and accepted requests.
4. Admin can see donation details.
5. Admin can see payment information and transaction id.
6. Admins can see volunteer information.
7. Admin can see registered organizations details.
8. Admin can add organizations to map.
9. Admin will have control of the full dashboard.
10. Admin can reply to information message.
11. Admin can give donation receipt to donor.
12. Admin can add or remove profile.
13. Admin can add or delete blogs.

3.3 Use Case Model and Description

In software and engineering, a use case is a group of steps that specify how a role and a system interact to accomplish a goal. Actors include people, external systems, and time. Use cases describe how external parties will communicate with a system. In UML terminology, these external entities are referred to as actors and might be either people or other systems. The description focuses on the system from the users' perspective and on how they interact with it. Use cases help to clarify the scope and boundaries of the system. Usually, they take the shape of a diagram with a textual description of the interaction that is occurring. The system is shown as a rectangle in the picture below, while use cases are shown as ovals inside the system's borders. Two actors are also shown as stick figures. An actor is a user or another system that will communicate with the modelled system. A use case is an external view of a system that depicts a possible user action to complete a task [25].

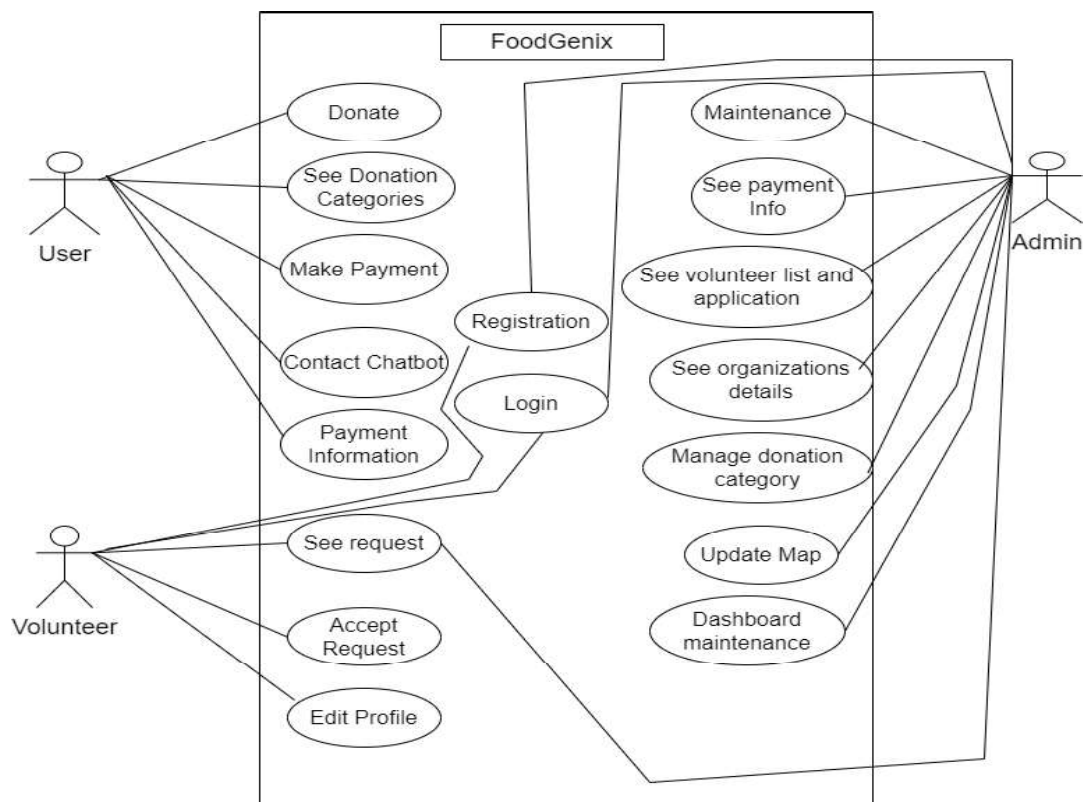


Figure 3.1: Use case diagram.

TABLE 3.1: SIGNUP FOR VOLUNTEER

Use case title	Signup
Type	Primary
Actors	Volunteer
Description	Volunteers can create a new account to register.

The above table describes the process of signing up as a volunteer on the website that facilitates volunteering opportunities. The use case allows individuals who are interested in volunteering to create an account and provide their relevant information to register as a volunteer.

TABLE 3.2: LOGIN FOR VOLUNTEER AND ADMIN

Use case title	Login
Type	Primary
Actors	Admin, volunteer

The primary actors are admin and volunteer. After giving the registration credentials a volunteer will be able to log in. Admin have firebase authentication to log in.

TABLE 3.3: SHARES DONE BY USERS

Use case title	Share
Type	Primary
Actors	User

User does not need any registration using live location users can donate excess leftover food. Similarly, donation to different categories can also be done. Manual system is also available, donation can be done by uploading credentials.

TABLE 3.4: REQUEST BY USERS

Use case title	Request
Type	Primary
Actors	User

The actor user can request for food by turning on device's location. Request will be available to admin and processed by volunteer.

TABLE 3.5: VOLUNTEERS WILL SEE THE USER'S REQUEST.

Use case title	See Requests
Type	Primary
Actors	Volunteer

Volunteer is a primary type actor and have access through registration Volunteers can see the requested credentials and can make delivery

TABLE 3.6: DONATION GIVEN BY PEOPLES.

Use case title	Donate
Type	Primary
Actors	User

Users can donate money using the payment gateway. There will be other donation categories and can be donated accordingly.

TABLE 3.7: DONATION RECEIPT FOR SUCCESSFUL TRANSACTION.

Use case title	Donation receipt
Type	Secondary.
Actors	User, admin

Successful transactions will be stored to data and admin panel. Admin can give receipt accordingly.

TABLE 3.8: ADMIN MAINTAINS ALL TASK OF THE APPLICATION.

Use case title	Maintenance of the application
Type	Primary
Actors	Admin

Admin have the control and access of the full website.

TABLE 3.9: ADMIN MANAGES ALL SHARED BLOG.

Use case title	Manage blogs
Type	Primary
Actors	Admin

Admin will be able to see all the post and story written by user.

TABLE 3.10: ADMIN MANAGES DONATION

Use case title	Manage donation
Type	Primary
Actors	Admin

Admin will be able to see all types of donations. Every fund donation transaction will also be seen.

TABLE 3.11: ADMIN MANAGES BANK ACCOUNTS

Use case title	Manage bank accounts
Type	Primary
Actors	Admin

Admin will be able to see payment gateway and bank information.

TABLE 3.12: ADMIN CAN SEE VOLUNTEER LIST

Use case title	See volunteer list
Type	Primary
Actors	Admin

Admin will be able to see all the list of volunteers who applied. All the information and can take next steps.

TABLE 3.13: ADMIN CAN SEE ORGANIZATION LISTS.

Use case title	See the organizations list.
Type	Primary
Actors	Admin

Admin will be able to see all the registered organizations.

TABLE 3.14: ACTORS CAN EDIT THEIR PROFILE.

Use case title	Edit profile
Type	Primary
Actors	Admin, volunteer

Admin can another admin by using firebase authentication. Volunteer needs to apply for editing profile.

3.4 Software Requirement

Front-end: React, HTML5, CSS3, Bootstrap5, JavaScript.

Back-end: NodeJs.

Database: MongoDB.

Payment gateway: Stripe.

Domain & hosting: render and netlify.

This website can be accessed from any smartphone, PC, and laptop with internet connection.

3.5 Logical Data Model.

The application, which is depicted in the Logical Data Model picture, will receive the response from the Rest API once it is called, it has firebase authentication and payment gateway. For back-end, I am using Node.js with several APIs and the database MongoDB [26]. All the information will be saved on specific different database names inside 1 cluster. For the card payment through stripe a different server is designed.

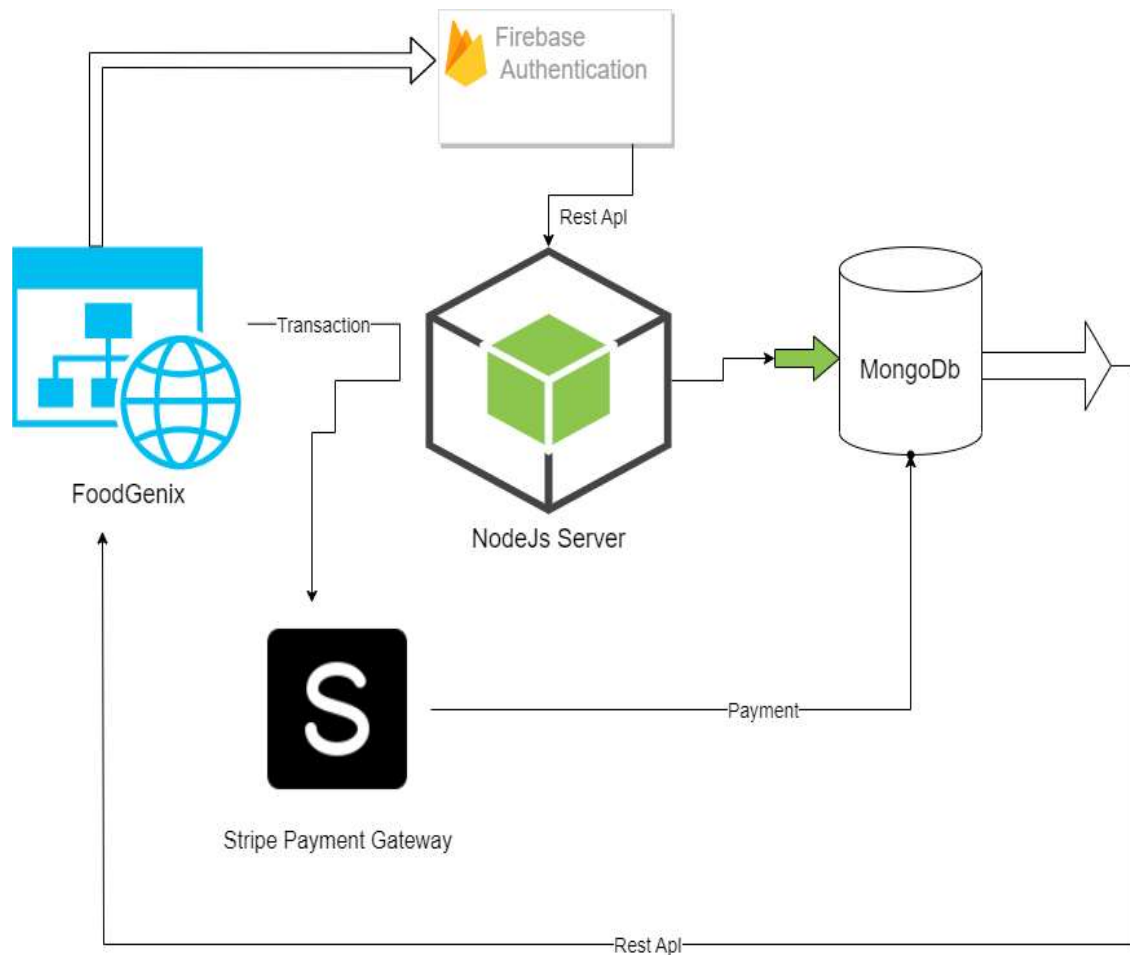


Figure 3.2: Logical data Model

3.6 Business Process Modeling.

The following figure explains the Business process model of the website for user and admin [27]. The business process model is designed in a very logical manner from the start admin and volunteer must be verified. If the verification through is successful then they will be able to work on further process. As we can see users, users just need to turn on location. User can also select donation category Admin panel is designed to be secured through stripe card payment.

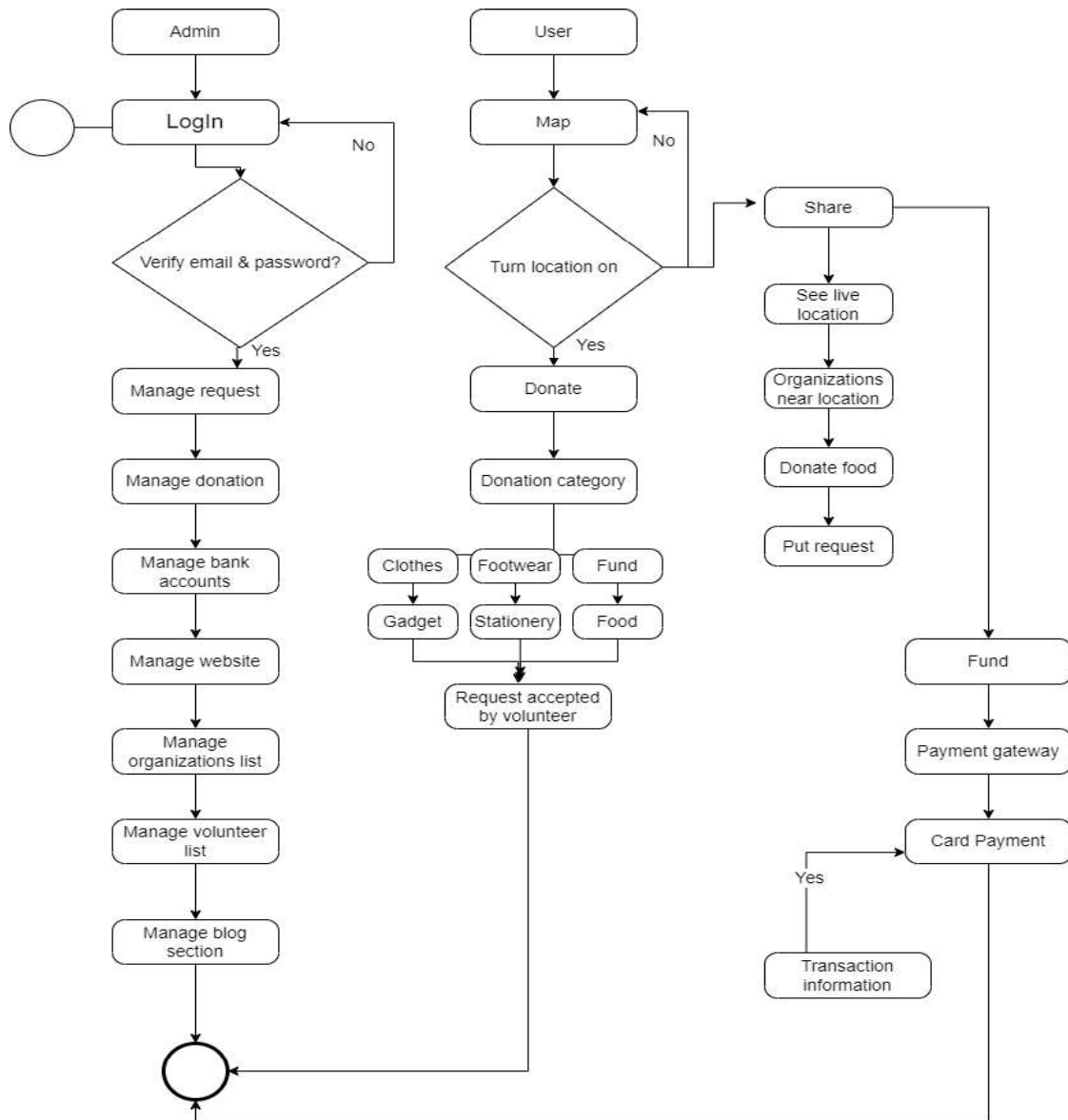


Figure 3.3: Business process model.

3.7 BPM Model for volunteer [28].

Registration for volunteer is must. After giving the credentials of registration and verified a volunteer will be able to log in. After logging in volunteer will be able to see further process. The volunteer will be assigned with delivery work. A volunteer will receive address and location of the donor from admin.

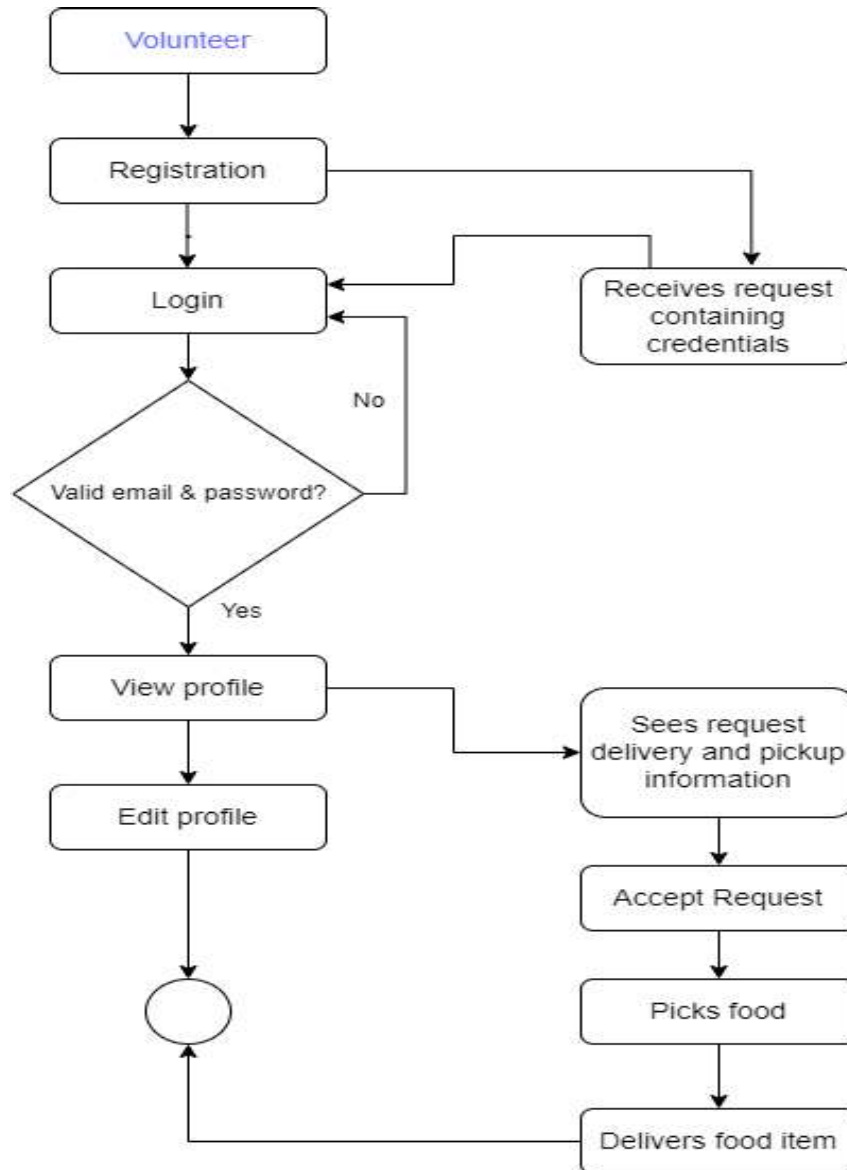


Figure 3.4: BPM for volunteer.

3.8 Data Flow Diagram

Below diagrams shows the DFD-0 of the website [29]. The data will be transferred between 3 actors admin, volunteer and user. User can donate food and also can donate in different categories. A user can also request for food using live location. Admin will have all the access of the website. Admin will be able to see volunteer list and can assign in any ongoing task. Lastly volunteer will be able to see location. For volunteer the registration process is a must needed. Admin will able to see the donation information also. Admin will also have the access of database. By using specific email address which is authenticated through firebase. As the website is in react for every component a new route will be created within the existing link,

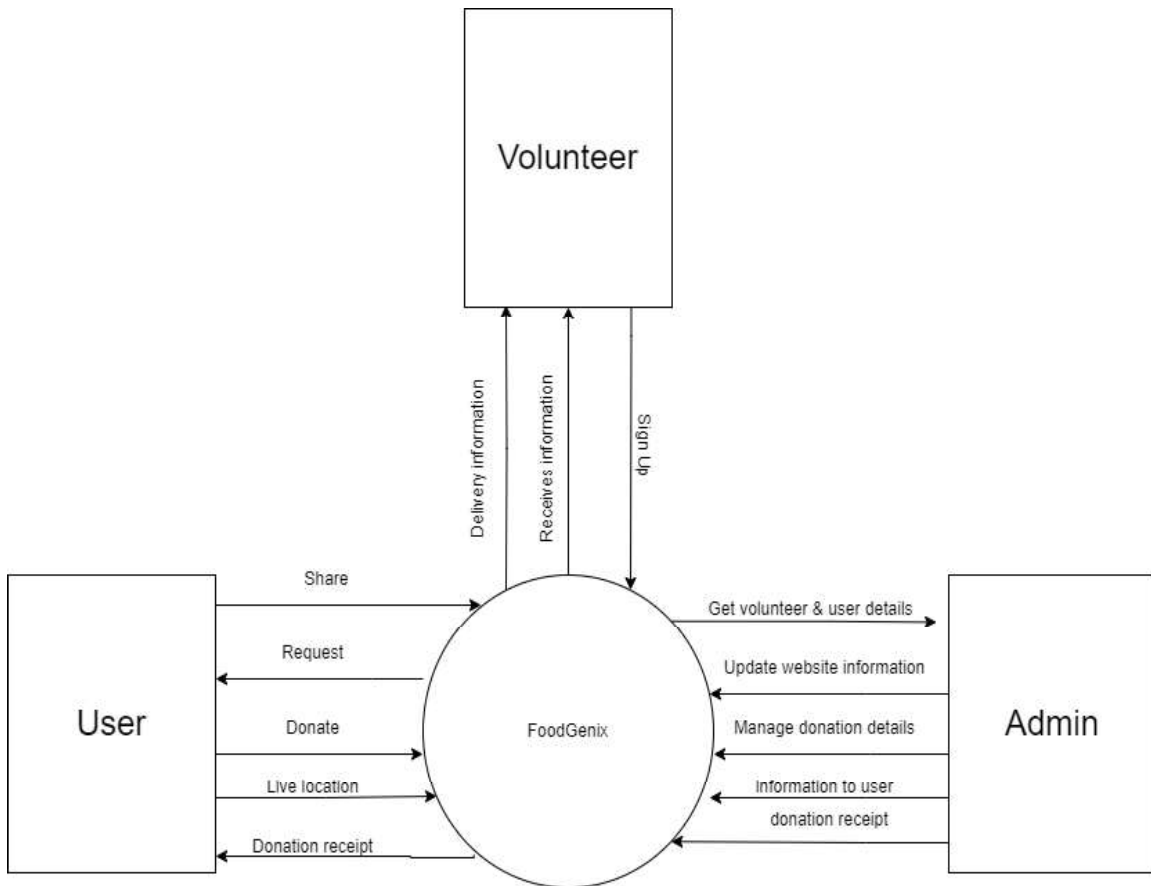


Figure 3.5: Data flow diagram.

3.9 Unified Modelling Language [30].

The user will interact with the class user includes attributes such as Map, address and contact which are essential for user to donate and request for food. The Donate class represents individual donations made by donors. It includes attributes such payment information name either anonymous and card information to track details of each donation. The registration class includes organization name and different details for registration. The volunteer class includes information for registration such as area mobile number etc. which will be further needed for log in to the system and will be assigned to work delivery which will be assigned by admin.

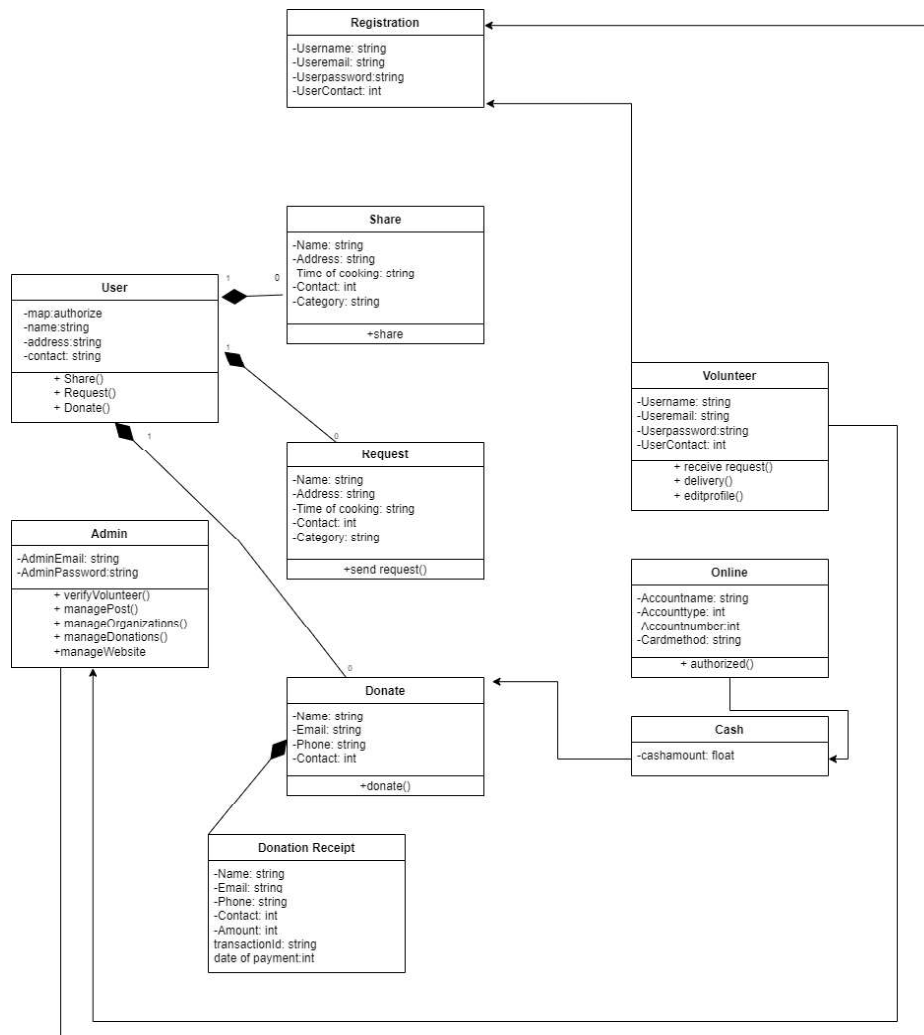


Figure 3.6: UML diagram.

3.10 Logical Diagram Payment Gateway [31]

The below figure describes how a payment will be done. Firstly, STRIPE payment gateway is user on the other side there will be server for the merchant by the gateway a request for session will be given, accepting it will return a session ID and will be redirect to the payment page giving the specific credentials will give Instant payment notification, this validation will be done in the validation API which is provided by the stripe gateway, if the payment credentials are all okay the page will redirect to the merchant's confirmation page. And lastly the payment will be stored in the database mongo dB in a specific database of a cluster.

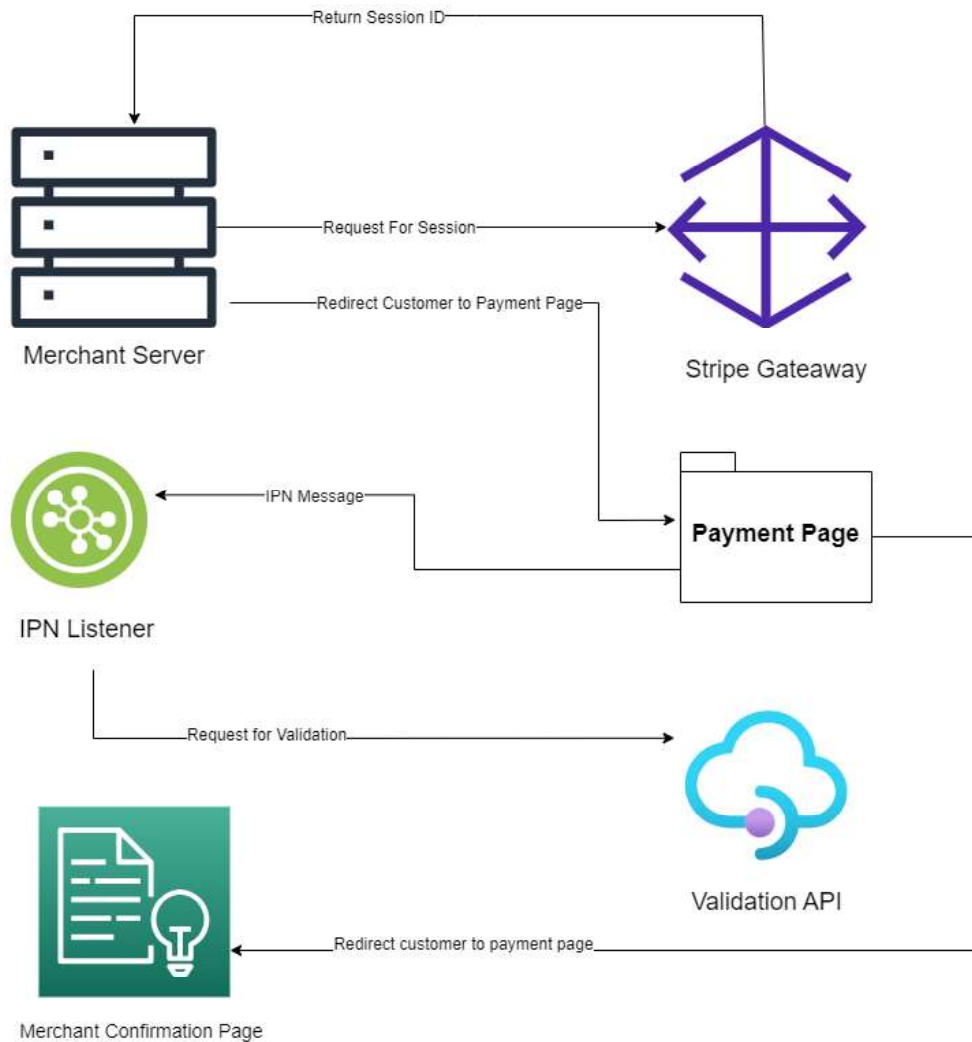


Figure 3.7: Logical diagram payment gateway.

CHAPTER 4

DESIGN AND SPECIFICATION

Because the front-end is where consumers engage with the system, I created a user-friendly and fluid design with this in mind.

4.1.1 Homepage

This is the first part of homepage which contains a navbar to navigate all links. The live donate button redirects to the link for live donation similarly others navigation tabs animate to its specific routes.

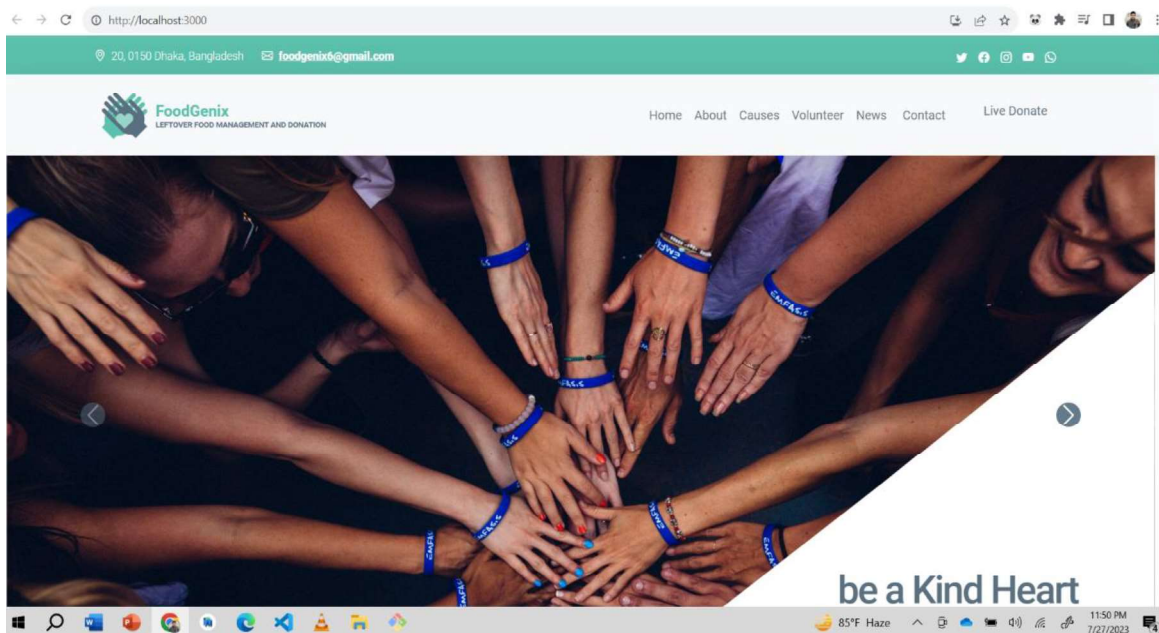


Figure 4.1: Homepage.

4.2.2 Homepage (Donation Category)

This part of the website contains 3 categories of donation. A user can donate as wish by clicking to donate now button and will be redirect to donation page. The first card contains donation for 3 categories Books/Stationery/Gadget.

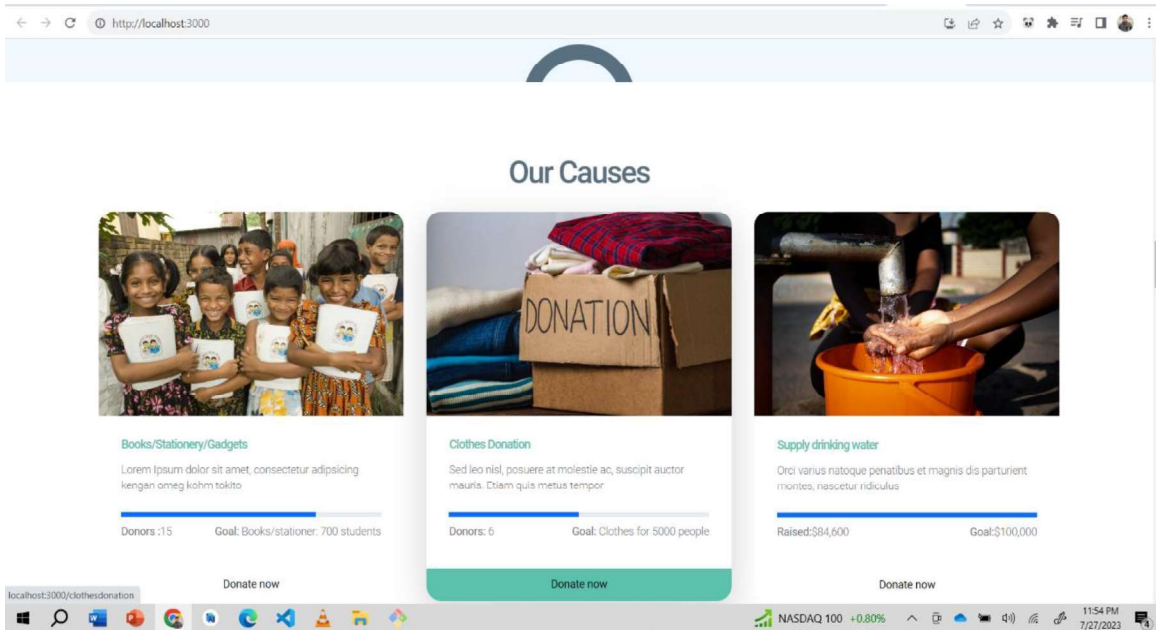


Figure 4.2: Homepage donation category

4.3.3 Homepage (About)

This part of the homepage contains about missions and a small brief is given about the working procedure. The motivation goal target is described in this part.

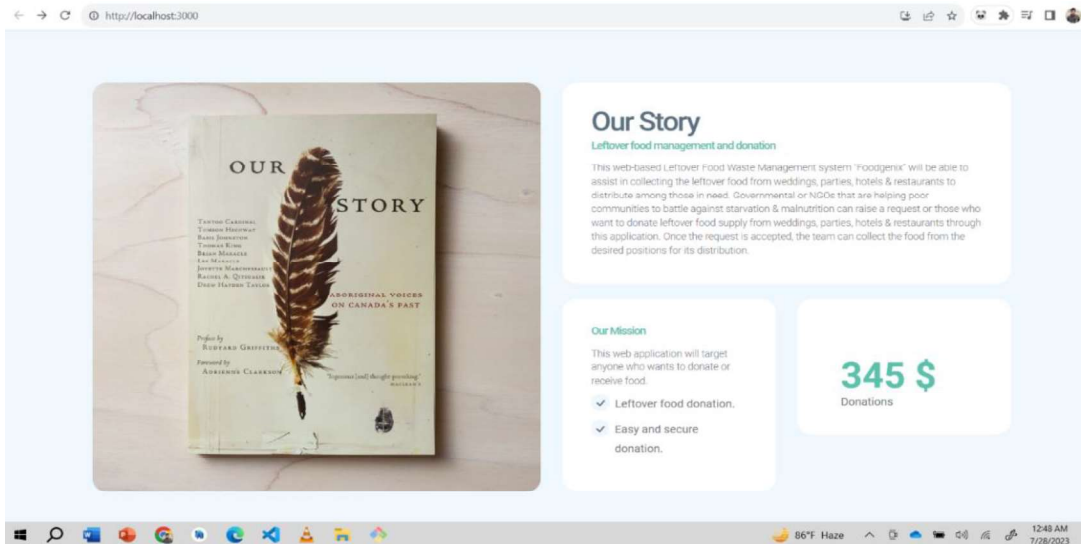


Figure 4.3: Homepage about.

4.4.4 Homepage (Ask a question)

This part of the homepage contains a query box from where a user can send message directly to the organizations HR. the form needs to be filled fully and in the query box desired enquiry should be written. Clicking on the send message button the provided information will be saved on organizations database.

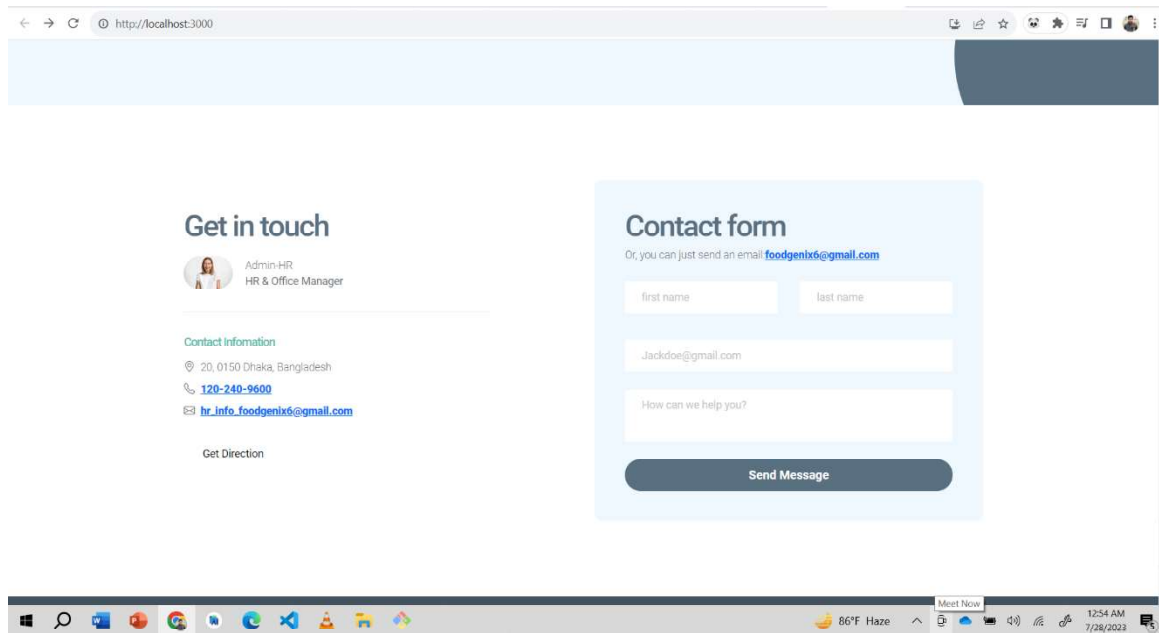


Figure 4.4: Homepage (Contact).

4.5.5 Homepage (Became a volunteer).

This section of the homepage contains a form to become volunteer. A user needs to fill up the form and click the button. This part can also be accessed from the navigation bar. In the volunteer registration cv upload is also available. After fulfilling the details all the information will be saved in the organization database. In the form volunteer need to mention there are, in future this part will be replaced through live location. As the informatio of the volunteer is saved in database admin can filter or search data according to area name.

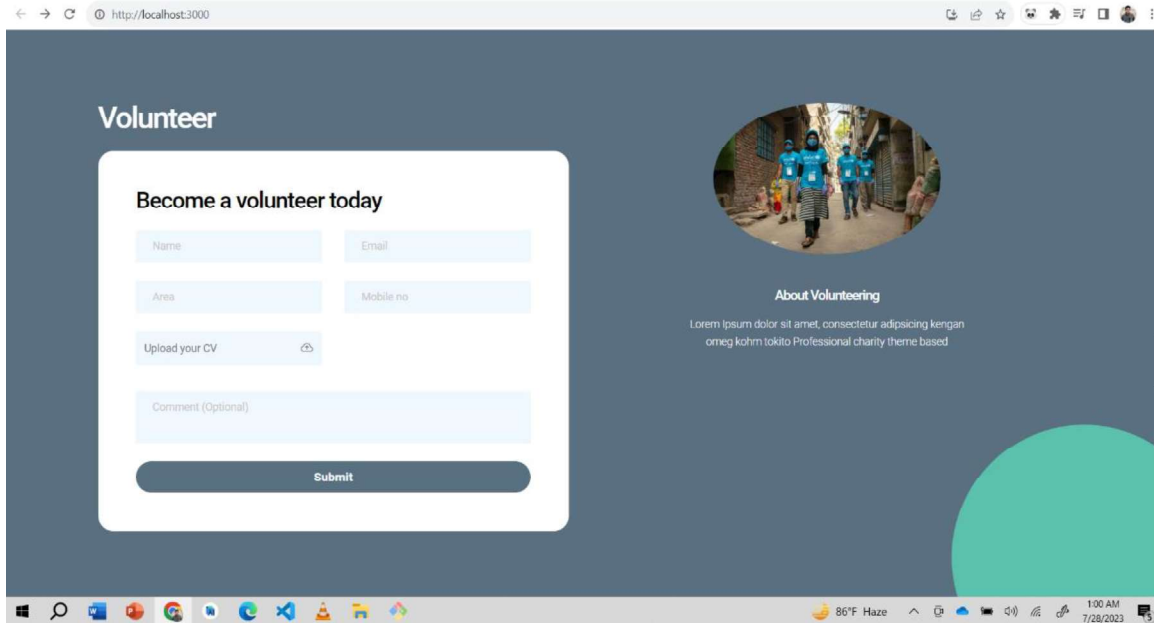


Figure 4.5: Become a volunteer.

4.6.6 Registration Page

In the navbar of homepage there is a link named register, clicking on it will redirect to a new page named register now, different organizations can give their details and create account all the information will be stored in the database.

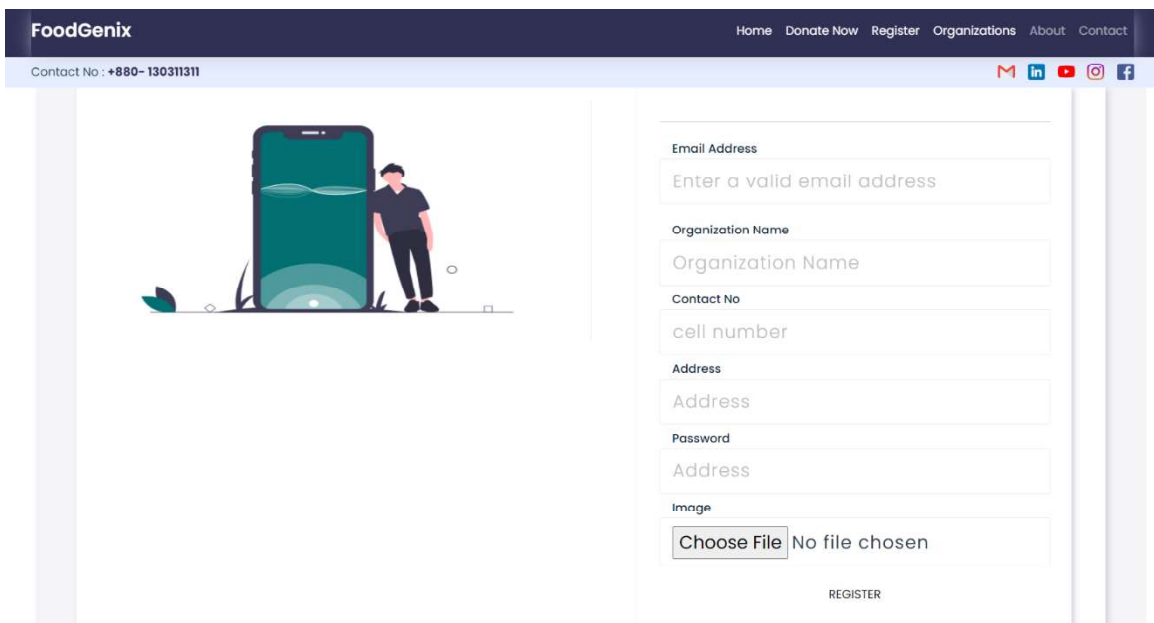


Figure 4.6: Registration page.

4.7.7 Registered organizations

After filling up the form all the information will be saved in database and then will be showed in the organization tab. The data is real time data which is fetched from database.

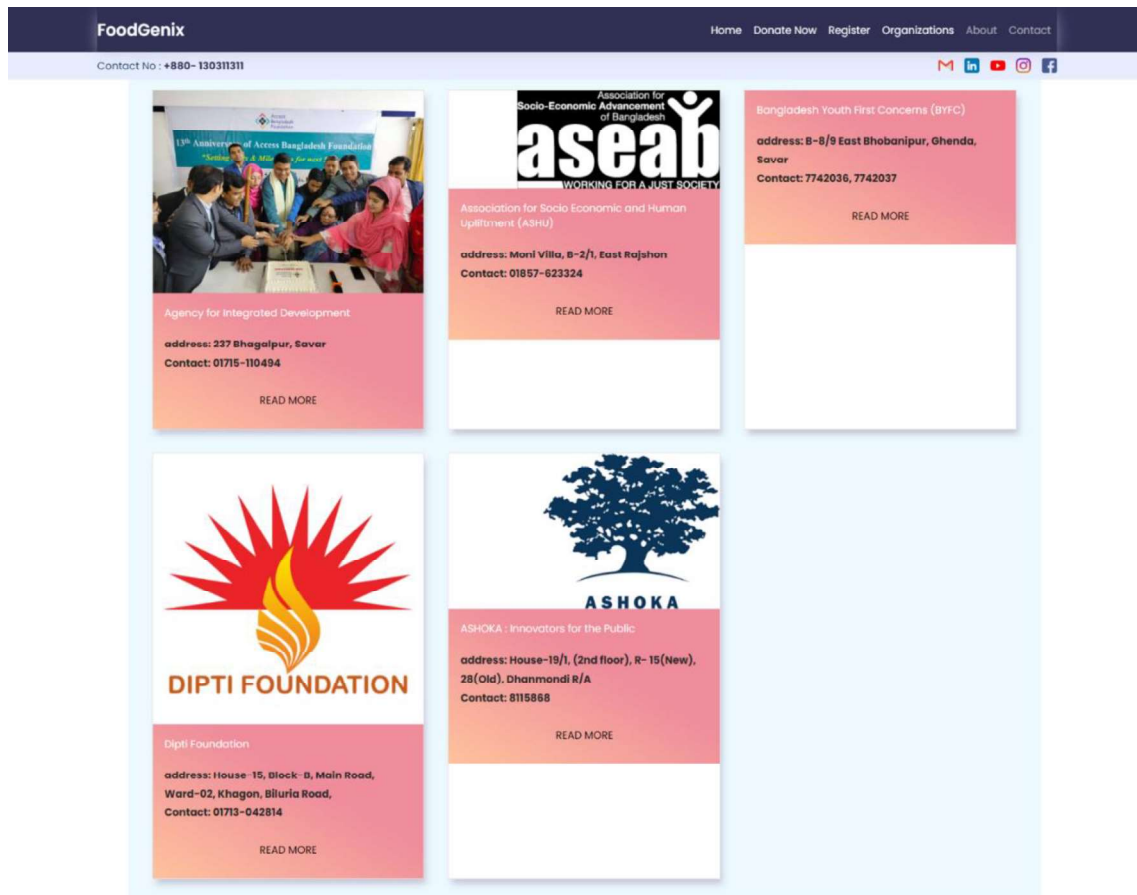


Figure 4.7: Registered organizations.

4.8.8 Payment Gateway

Navigating to donate now it will redirect to a link and there will be different payment system I have used Stripe as the payment gateway. User can donate identically also there is an option to donate anonymously. The payment information will also be saved in data base. The payment option is also available in the homepage of the website. All the links are connected to the same route.

Welcome To General Donation

Enter Amount here...

Enter name here...

Want to pay anonymously? ▾

Card EPS giropay Bancontact ▾

Secure, 1-click checkout with Link ▾

Card number

1234 1234 1234 1234 VISA Mastercard American Express Discover

Expiration CVC

MM / YY CVC

Country

Bangladesh ▾

Pay now

Figure 4.8: Payment Gateway.

4.9.9 Admin Panel

Admin will be in charge for the maintenance of the website. The below figure shows admin will be the numbers and a map where organizations are situated, Admin will have the access to database. Admin will assign rider from the volunteer lists. Admin can verify the news which are prepared. All the information of the organization will be accessible to admin the information will be verified first and the uploaded to fetched the data. For every registration a new object ID is created. The payment information will also be saved in data base. The payment option is also available in the homepage of the website. All the links are connected to the same route. The data is real time data which is fetched from database. different organizations can give their details and create account all the information will be stored in the database.

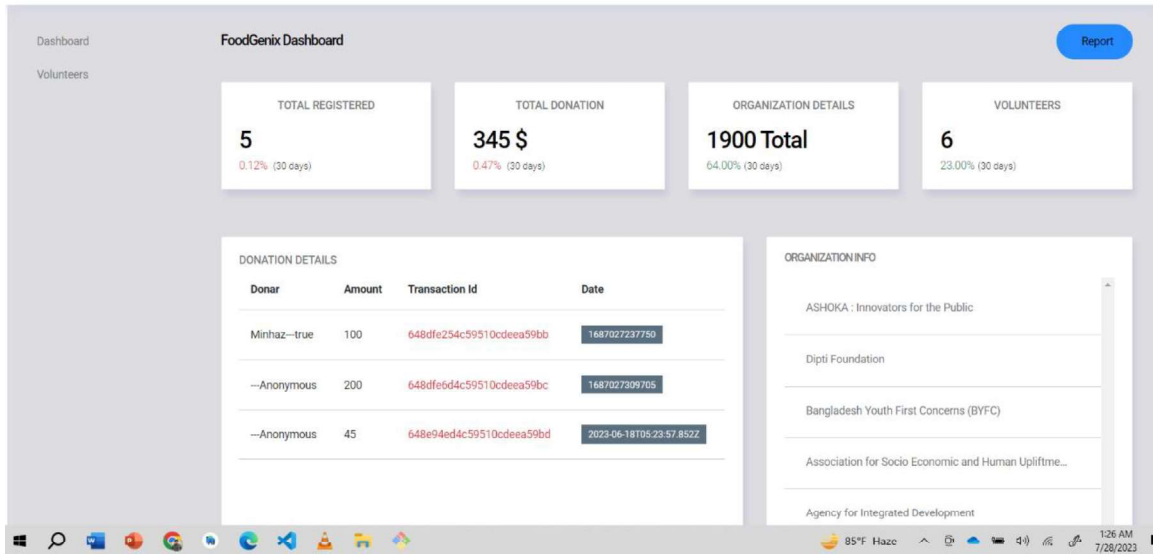


Figure 4.9: Admin panel.

4.10.10 Admin panel (Volunteer details)

In this part all the information about volunteers is available. This are the information given by volunteer while registering also these data are coming from database. The volunteer list has 2 parts one all the details are available all the details those are filled up during the volunteer registration process. The second part consists of the same data but I have dynamic search field by which admin can search volunteer according to area. At last, there is also a button named Assign now by clicking on the button the volunteer will receive the desired location information from admin

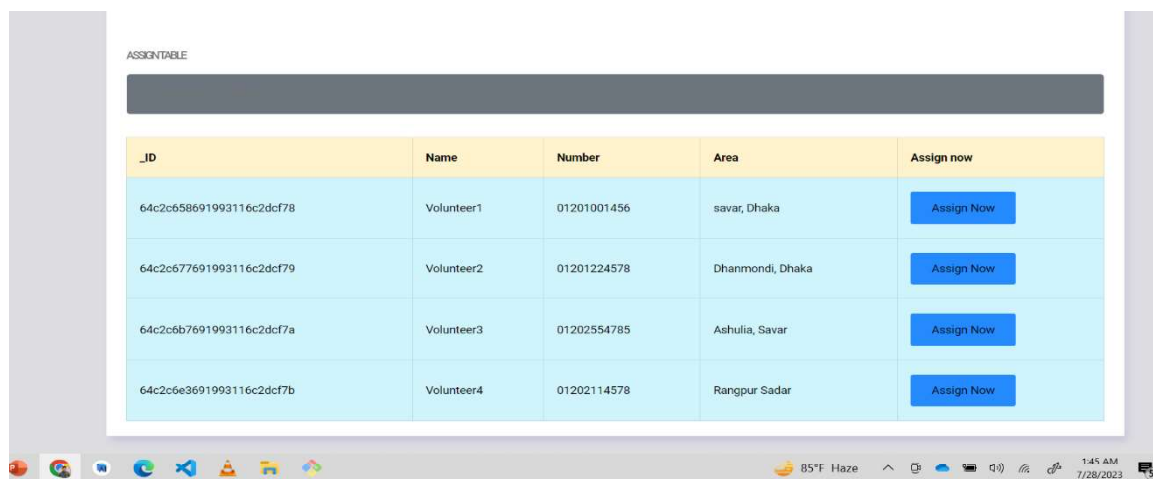
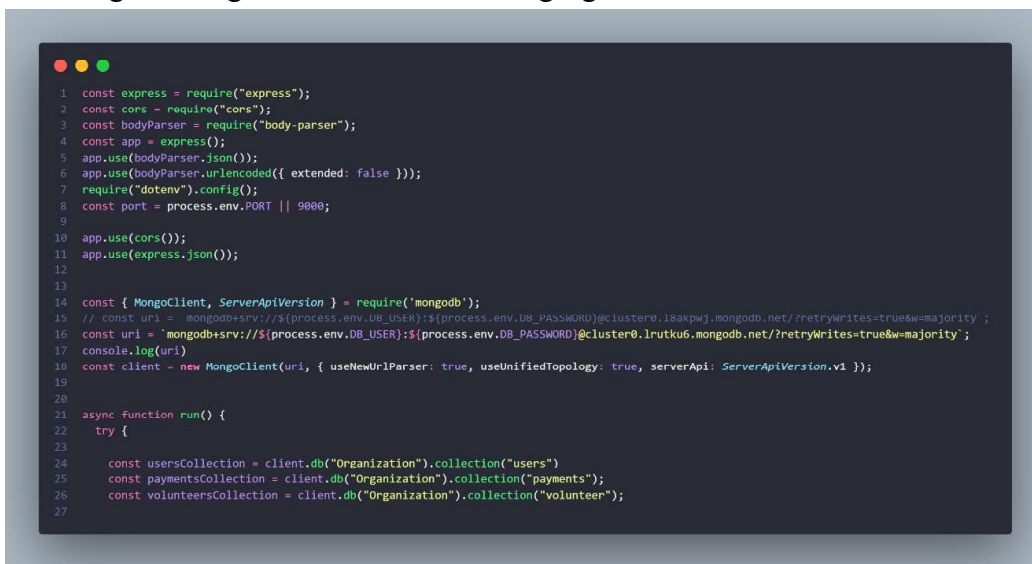


Figure: 4.10: Organization and payment details (Admin).

4.2.1 Backend Design.

I have used NodeJS as Backend for this project. For the backend framework I used expressJs. For protecting important and valuable information Dotnev is used. For parsing the values through body parser is also used. For running the project locally port 9000 is used, creating a custom uri the credentials of mongodb are placed. The credentials of mongodb database are kept in the Dotnev file for security purpose. Finally, connection is established through a client constant value. After a secured and successful connection async function is used. In the async function specific constant value is added for specific collection. For every specific route a specific API is created is. For example, to store the data of volunteer registration form a API name /addVolunteer is created. Using POST method data will be posted to the server similarly for another requirement different APIs are created. As data are being posted by POST method, I used GET method to achieve data from database the API remains same but the method is changed to GET. By this method I am able to fetch data from database.

The file contains very sensitive information for example the secret key of stripe payment gateway, the connection url of mongodb database, port name and many more this information cannot be made public thus I have used dotnev to secure these credentials. While storing data in github the dotnev file is gitignored.



```
1 const express = require("express");
2 const cors = require("cors");
3 const bodyParser = require("body-parser");
4 const app = express();
5 app.use(bodyParser.json());
6 app.use(bodyParser.urlencoded({ extended: false }));
7 require("dotenv").config();
8 const port = process.env.PORT || 9000;
9
10 app.use(cors());
11 app.use(express.json());
12
13
14 const { MongoClient, ServerApiVersion } = require("mongodb");
15 // const uri = `mongodb+srv://${process.env.DB_USER}:${process.env.DB_PASSWORD}@cluster0.l8akpw.mongodb.net/?retryWrites=true&majority `;
16 const uri = `mongodb+srv://${process.env.DB_USER}:${process.env.DB_PASSWORD}@cluster0.lrutku6.mongodb.net/?retryWrites=true&majority`;
17 console.log(uri)
18 const client = new MongoClient(uri, { useNewUrlParser: true, useUnifiedTopology: true, serverApi: ServerApiVersion.v1 });
19
20
21 async function run() {
22   try {
23
24     const usersCollection = client.db("Organization").collection("users")
25     const paymentsCollection = client.db("Organization").collection("payments");
26     const volunteersCollection = client.db("Organization").collection("volunteer");
27
```

Figure: 4.12 Backend Design.

4.4 Implementation Requirement

I applied a variety of tools, properties, and components that were helpful in the effective development of my web project. I utilized Bootstrap and my own CSS to design a user interface that is welcoming and simple.

For different types of interaction, I used JavaScript. The library I used is ReactJs.

For Map I have used ReactLeaflet and tiles for map are from maptiler.

For server design I used NodeJS along with express, for payment gateway Stripe is used.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1.1 Database Implementation.

I used MongoDB database in the application. Data has been passed through different API'S with GET and POST method.

5.2.2 Database Overview.

The database is named as FoodGenix and it has different clusters accordingly.

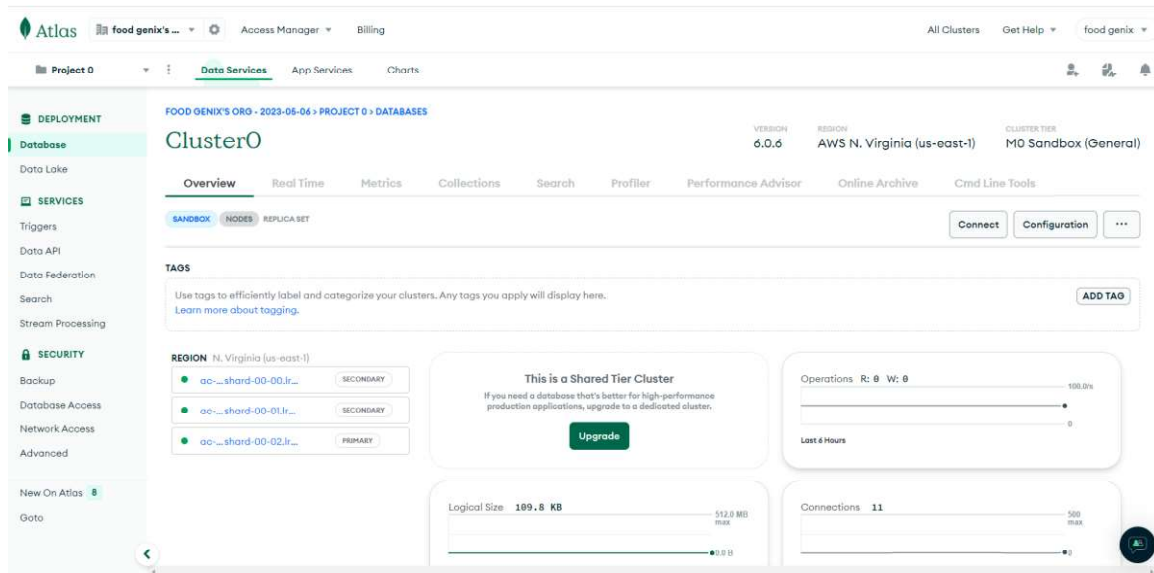


Fig 5.1 Database Overview.

5.3.3 Database Overview (organizations details).

From the register page in client side filling up the form all the data are saved in this collection. The id is automatically generated. The client side of the desired part contains a form for multiple data. The form data is handled through POST method. In each input field a specific name is given through which data is being transferred through database.

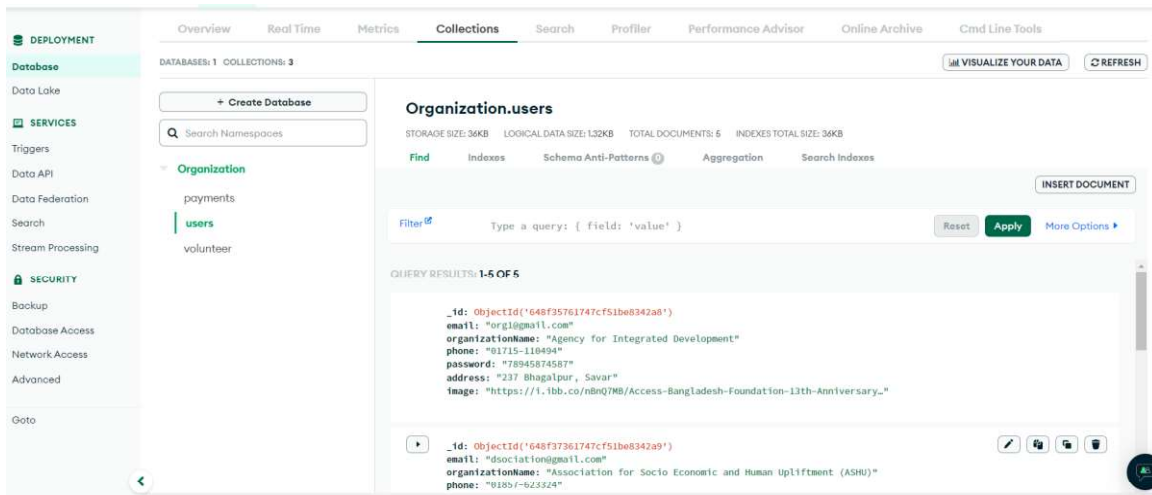


Fig 5.2 Organization details.

5.4.4 Database Overview (Volunteer list).

In the cluster another collection is named as Volunteer. All the information from client side is stored here. The form from the client side consists of 4 input fields all the data from the client side is stored in this collection. The input character which is named as name the value inside name is same as saved in the database. Each of the volunteer has an unique ID which is automatically generated by database.

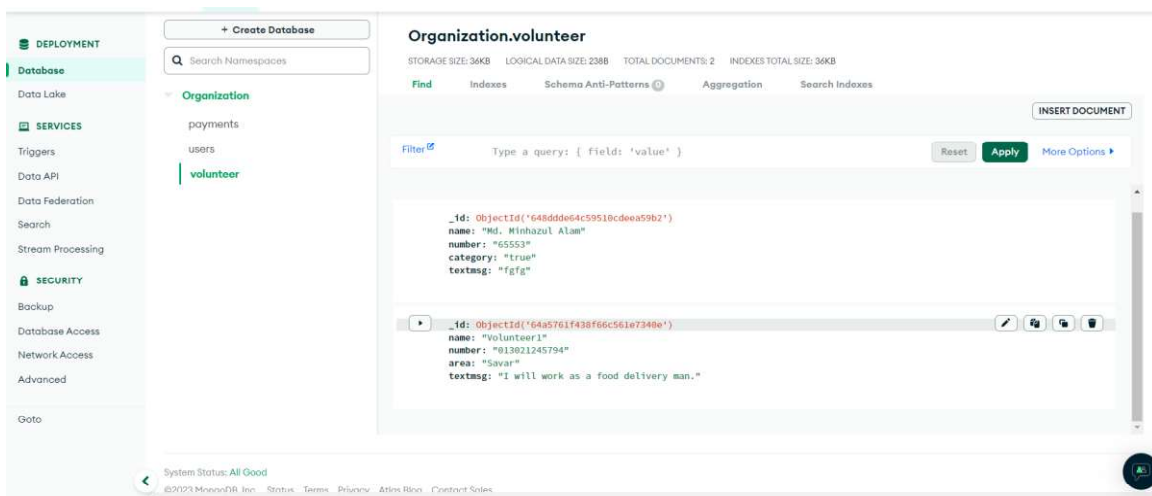


Figure 5.3: Volunteer list.

5.5.5 Database Overview (Payment Information).

All the payment information will be saved in this collection. In the figure we can see 3 payment details.

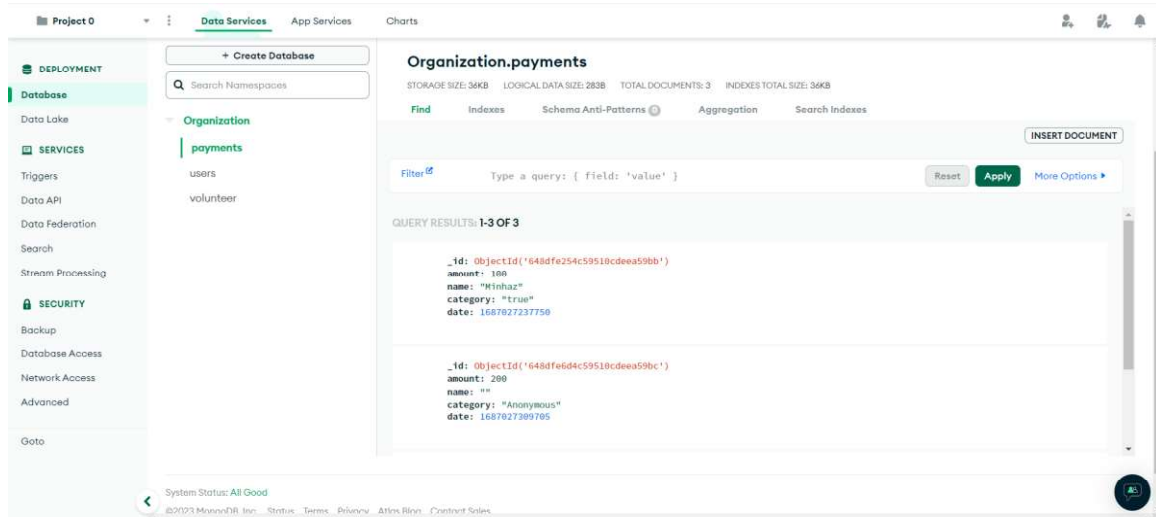


Figure 5.4: Payment Information.

5.2 Implementation (Front-end Design).

For the frontend, I used Bootstrap 5 and JavaScript in accordance with current trends. I created a nice UI to let users feel at ease. The design is straightforward but functional. However, I will consider user comments and make modifications to the design.

5.3 Implementation Interactions.

I intend to cut lower on waste. I need to educate people about the importance of sharing meals. That is why I kept the interface simple and straightforward to use for posting. The sharer will post in no more than 2 minutes (depending on network conditions). It will not charge the sharer anything. The data of the user is completely protected. I guarantee our users' complete privacy. I will contact the owners of buffet restaurants to solicit their support.

5.4 Test Results and Reports.

I manually tested the website when the project was completed. Testing is essential for identifying issues in the website. It is also critical to ensure that the functionalities are fully operational. This work involves functional testing. It is also known as black box testing. The website's functionality is tested here. This sort of testing focuses solely on user input and output. I sent my classmates the website URL and instructed them to register as users and volunteers. I personally tried the admin panel. I created test cases for individual modules [32].

TABLE 5.1: ADMIN LOGIN REPORT

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
1	06/05/22	Login Admin	Admin logs in via firebase.	Email and password of admin/google sign in	Pass

The "Login Admin" testing enables the website administrator to access the website's admin panel by providing their login credentials. The admin has two options for authentication: using their email and password or signing in through Google Sign-In.

TABLE 5.2: USER OR VOLUNTEER LOGIN REPORT.

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
2	13/05/22	Login User or volunteer	Login User or volunteer	Email and password of user and volunteer/google sign in	Pass

The above-mentioned test is done by providing the credentials of volunteer credentials at the time of registration. Providing the correct credentials, it was possible to log in, also when the credentials didn't match it showed error message.

TABLE 5.3: VOLUNTEER SIGN UP REPORT.

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
3	14/05/22	Registration volunteer	Signing up as volunteer	Name, email, phone, area, message	Pass

Firstly, the credentials a volunteer gave while registration are taken, all the input field needs to be filled if one of the input fields in not filled and clicked to registration it showed error message which field should be filled.

TABLE 5.4: DONATION REPORT.

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
4	24/05/22	Donate Now	Payment gateway and different bank accounts	N/A	Pass

The above table mentioned the payment gateway testing a donation was one by providing sample card number.

TABLE 5.5: DONATION TRANSACTION REPORT.

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
5	24/05/22	Transaction information	Can get user credentials	Donors	Pass

After completing a successful payment by providing sample card number the information for donation is saved in database.

TABLE 5.6: ADMIN MANAGES WEBSITE REPORT.

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
6	10/06/22	Admin manages map, social link, banners	<ol style="list-style-type: none"> 1. Upload registered users to API. 2. Changing social links 	Log in Info of Admin	Pass

The articles and any functionality website can be changed by admin. The admin also has a login info a specific email is admin.

TABLE 5.7: ADMIN MANAGES POSTS REPORT.

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
7	10/06/22	Manages post	CRUD operation for posts.	Post details	Pass

CRUD operation is done create, read, update, delete the operations are done in volunteer list

TABLE 5.8: DONATION REPORT.

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
8	20/06/22	Transaction numbers, user credentials	See name or anonymous	Pay through bank	Pass

After a successful transaction it is seen the data is saved in database. User who donated using name is saved name on the other hand user ho clicked anonymous the data is also saved but as named anonymous.

TABLE 5.9: MAP DATA.

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
9	24/04/23	Plotting data on map.	Credentials from input form	Location	Pass

Clicked on the button live donate it redirected to a map page and was able to locate current location of the user. Initially showed blue markers with name. Clicking on locate me red marker appears and showed user current location name. Also, the distance was show from current location to organization. live donate it redirected to a map page and was able to locate current location of the user. Initially showed blue markers with name. Clicking on locate me red marker appears and showed user current location name. Also, the distance was show from current location to organization

TABLE 5.10: DONATION TRANSACTION REPORT.

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
10	28/04/23	Real time information	Information receiving through BOT	Message request	Pass

Successful appearance of donate now and request food was available, and working fine.

TABLE 5.11: DONATION CATEGORY.

Test Case ID	Date	Feature Name	Test Case Description	Input Data	Test Result
11	24/05/23	Donation Category	Can donate in different categories	Books, clothes, fund, stationery, gadgets	Pass

3 card was available to donate in different categories. It redirected to a new form page.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Conclusion.

When I first started looking into this idea, I discussed it with my supervisors. Some commenters will not post or make a request. Because this is a new website, no website has been created as of yet. I had no idea how users would react to it. Users will need time to adjust to the website and this new type of sharing and requesting. I also need to spread the word about my website. Food waste will decrease as more people become aware of it. I was confident that once people understood my website's concept, food waste would be minimized to a greater level. I've made it as simple as possible for users to post. It will just take 2 minutes to post. The best part or feature of this is website is the live location users just need to turn on location and can find organizations near them. The website has also different donation categories. The user must enter his or her phone number, address, the category in which he or she is posting, and some photographs of his or her products before they can be posted. When a request comes in, the website sharer's credentials are automatically texted to a volunteer. The webpage will show pickup and delivery details to the volunteer. The requester can also pick up their own stuff. I will accept donations to help fund our endeavor. My major goal is to eliminate food waste and assist those in need.

6.2 Future scope and development.

No project is finished in one go. Every project has room for development and enhancement. I did my homework and added the crucial elements. However, I'll make improvements after hearing from users. I have also scheduled some of the features that I am developing. Those are

- Bangladeshi payment gateway.
- Area coverage.
- Increase donation category.
- Live delivery tracking.

REFERENCES

- [1] FoodGenix, available at << <https://main--fascinating-puffpuff-1969ed.netlify.app/>>>, last accessed on 7-29-2023 at 3:24 AM.
- [2] The Financial Express, available at << <https://thefinancialexpress.com.bd/national/most-food-waste-takes-place-at-wedding-parties-actionaid-bangladesh-1573707217>>>, Last accessed on 5-01-2023 at 10.25 AM.
- [3] The Business Standard, available at << <https://www.tbsnews.net/thoughts/food-wastage-high-when-significant-portion-go-hungry-263452>>> Last accessed on 5-01-2023 at 10.35 AM.
- [4] Consumer Advice, available at << <https://consumer.ftc.gov/articles/giving-charity> >> Last accessed on 5-01-2023 at 10.25 AM.
- [5] BD News24, available at << <https://bdnews24.com/bangladesh/prices-soar-in-bangladesh.-leftover-party-food-for-the-poor-in-dhaka-is-no-exception> >>, Last accessed on 5-02-2023 at 11:25 AM.
- [6] World food programme, available at << <https://www.wfp.org/stories/5-facts-about-food-waste-and-hunger>>>, Last accessed on 5-02-2023 at 11.55 AM.
- [7] SSRN, available at <<https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3498579>>, Last accessed on 6-03-2023 at 10.20 PM.
- [8] IMF, available at <<<https://www.imf.org/en/Blogs/Articles/2022/09/30/global-food-crisis-demands-support-for-people-open-trade-bigger-local-harvests>>>, Last accessed on 7-03-2023 at 9.25 AM.
- [9] Dhaka Tribune, available at << <https://archive.dhakatribune.com/magazine/2018/01/28/wedding-food-waste> >>, Last accessed on 7-03-2023 at 10.41 AM.
- [10] Asia Times, available at << <https://www.indiatoday.in/trending-news/story/ias-officer-shares-pic-of-food-wasted-at-wedding-here-s-what-twitter-has-to-say-1914957-2022-02-18>>>, Last accessed on 7-03-2023 at 12:20 PM.
- [11] The World Bank, available at << <https://www.worldbank.org/en/news/feature/2016/10/14/rising-bangladesh-brings-hope-ambition-and-innovation-to-end-poverty> >>, Last accessed on 7-03-2023 at 4.25 PM.
- [12] W3 Schools, available at << <https://www.w3schools.com/whatis/> >>, Last accessed on 5-02-2022 at 10.25 AM.
- [13] Final year project report format, available at << <https://pmiscse.daffodilvarsity.edu.bd/> >>, Last accessed on 6-07-2023 at 10.25 PM.

[14] One Taka Meal, available at << <https://onetakameal.org/about>>>, Last accessed on 6-07-2023 at 10.25 AM.

[15] Meals for All Bangladesh, available at << <https://www.mealsforallbd.org/about-us/> >>, Last accessed on 5-01-2023 at 10.40 AM.

[16] Food Panda Bangladesh, available at << <https://en.prothomalo.com/corporate/foodpanda-launches-donation-campaign-to-help-the-poor>>>, Last accessed on 5-01-2023 at 10.55 AM.

[17] Action Aid, available at << <https://actionaid.org/who-we-are>>>, Last accessed on 5-03-2023 at 10.25 AM.

[18] Jagoo Foundation, available at << <https://jaago.com.bd/faq/>>>, Last accessed on 5-03-2023 at 10.58 AM.

[19] Chaldal Food Aid, available at << <https://foodaid.chaldal.com/> >>, Last accessed on 5-03-2023 at 3:45 PM.

[20] Food Bank Network Bangladesh, available at

<<<http://www.foodbanknetworkbangladesh.org/index.php?page=about>>> Last accessed on 5-04-2023 at 10.25 AM.

[21] Bidyanondo Foundation: available at << <https://www.bidyanondo.org/about> >>, Last accessed on 5-01-2023 at 10.25 AM.

[22] ResearchGate, available at

<<https://www.researchgate.net/publication/336588624_Sustainable_Solid_Waste_Management_in_Bangladesh_Issues_and_Challenges>>, Last accessed on 15-01-2022 at 7:45 PM.

[23] United Nations, available at << <https://www.un.org/en/observances/end-food-waste-day> >>, Last accessed on 25-01-2023 at 12.25 PM.

[24] UNESCO, available at << <https://unesdoc.unesco.org/ark:/48223/pf0000252749> >>, Last accessed on 29-04-2023 at 5:20 PM

[25] Draw.io Use Case, available at << <https://app.diagrams.net/#G1nITaVwWQM0mnYyCgGi94ow-VRwtjmdw3> >>, Last accessed on 6-07-2023 at 9:45 AM

[26] Draw.io Logical, available at << <https://app.diagrams.net/#G1SVeZm2As1xcOvVTUq-19Js2fl0RKgry0> >>, Last accessed on 6-07-2023 at 11.45 AM

[27] Daw.io BPM, available at

<<<https://app.diagrams.net/#G1Tqr-YYDYHCxO9W1mO20PMThCJ74K78rU> >>, Last accessed on 6-07-2023 at 1.55 PM

[28] Draw.io BPM, available at << <https://app.diagrams.net/#G16AGy5rdt-PdXz1SiNkRNNHIddmn3canW> >>, Last accessed on 6-07-2023 at 3:25 PM

[29] Draw.io DFD-0, available at

<< <https://app.diagrams.net/#G1x0Hw0BPiOT7akPT71bIoit5TZM2uhbv1> >>, Last accessed on 6-07-2023 at 6.30 PM

[30] Draw.io UML, available at

<< <https://app.diagrams.net/#G1w0M2dogHUsFCp5Q4dEnoWt0I3R96WjQ0>>>, Last accessed on 7-07-2023 at 10.25 AM

[31] Draw.io L_payment, available at

<< https://app.diagrams.net/#G1k_YeefiAWB1zXtquaGVnqoAVh538pRpf >>, Last accessed on 7-07-2023 at 12.11 PM

[32] Test Reports, available at << <https://www.guru99.com/test-case.html> >>, Last accessed on 6-07-2023 at 10.51 PM

[33] In pictures: Decadent waste at weddings, available at << <https://archive.dhakatribune.com/image-gallery/2018/06/30/in-pictures-decadent-waste-at-weddings>>>, Last accessed on 7-27-2023 at 10.51 PM

[34] Test Reports, available at << <https://sociostory.org/blogs/zero-hunger-poverty-to-power>>>, Last accessed on 7-27-2023 at 10.58 PM

Minhazul Alam

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