

Donation Centre and Orphanage Location Website
(Safe Haven)

Final Year Project Report

by

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Session: BSIT 2021 – 2025

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Donation Centre and Orphanage Location Website

(Safe Haven)

EXECUTIVE SUMMARY

The Safe Haven project is a web-based platform designed to connect orphanages with donors, facilitating transparent donations, efficient orphanage management, and seamless communication between stakeholders. This project proposal outlines the system's objectives, including an intuitive interface, real-time orphanage search and secure donation tracking.

The Software Requirements Specification (SRS) defines the system's functional and non-functional requirements, covering key features such as user authentication, orphanage listing, donation management, gamification elements, and an admin dashboard for monitoring and moderation.

The Software Design Specification (SDS) also provides a detailed technical structure, including system architecture, database design, and third-party API integrations like Google Maps for location tracking and EasyPaisa for payment processing.

The Safe Haven prototype serves as a preliminary visualization of the system, showcasing interactive user interfaces, workflows, and essential features to validate usability and functionality. The requirements and use case analysis ensure a user-centric approach, aligning system capabilities with real-world needs.

By integrating accessibility features and security measures, the platform aims to create an inclusive and trustworthy environment. This document collectively establishes a foundation for the structured development and deployment of Safe Haven, ensuring scalability, reliability, and efficiency in connecting orphanages with potential supporters.

FYDP OVERVIEW

FYDP Title: SAFE HAVEN

Sr. No	Roll Numbers	Name	Signatures
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Table 1 Project Proposal Summary

FYDP Goals	<ul style="list-style-type: none">• Create a Centralized Platform• Enhance Transparency• Simplify the Donation Process• Improve Resource Allocation• Increase Donor Engagement• Implement Secure Access• Support Scalability• Encourage Social Responsibility• Support Multiple Orphanage Needs
FYDP Objectives	<ul style="list-style-type: none">• Develop a centralized web platform for orphanage support.• Simplify the donation process.• Ensure transparency in fund utilization and orphanage needs.• Increase the visibility of orphanages through detailed profiles.• Enhance community engagement through awareness campaigns.• Facilitate long-term sponsorship opportunities for organizations.• Introduce gamification features to motivate user participation.• Offer a subscription-based donation model for sustained support.• Integrate educational resources on adoption and child welfare• Support diverse donation types (money, food, clothing, medical aid).• Strengthen data security and privacy for all users• Expand the platform's reach to connect orphanages globally.
FYDP Success Criteria	<ul style="list-style-type: none">• Fully Functional Web Platform• User-friendly Interface• Accurate & UpToDate Information• Secure User Authentication• Seamless Donation Process

	<ul style="list-style-type: none"> • Increased Donor Participation • Successful Resource Allocation • Positive User Feedback • Scalability & Future Expansion
Assumptions:	<ul style="list-style-type: none"> • Availability of Reliable Data • Donors Are Willing to Use the Platform • Stable Internet Connectivity • Orphanages Have Basic Digital Literacy • Users Trust the Platform • Scalability Is Feasible • Secure Transactions • Legal and Ethical Compliance • Minimal Maintenance Effort • Collaboration with Orphanages
Risks & Obstacles	<ul style="list-style-type: none"> • Fraudulent Activities and Misuse of Funds • Difficulty in Verifying Orphanage Legitimacy • Legal and Compliance Challenges • Scalability and Performance Challenges • Resistance from Orphanages • Complexity in Donation and Resource Allocation • Internet Connectivity Issues in Remote Areas • Technical Issues and System Downtime • Security and Privacy Concerns • Low User Engagement
Organisation Address:	Government Jinnah Islamia Graduate College Sialkot
Target End Users:	Orphanages, donors, donation centers
Suggested Project Supervisor	Prof. Muhammad Abu Zar Tamimi
Approved By:	
Date:	10 th march, 2025

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Safe Haven is an online platform that acts as a central hub and is created to bring orphanages and donation centers to people who wish to give a helping hand, by donating. It serves as a sanctuary where orphanages can share their needs, stories and contact data, and donors can find out what the orphanages need.

Now, think for a moment that you have the means to help those in need, but you do not have a reliable way to do so. You want to donate to a local orphanage, but you are not sure if the orphanage near you is authentic or not, what to give to these organizations or if your donation will even reach the right hands. This is the reality for many potential donors in a city like Sialkot.

Many people want to contribute but face obstacles:

- No centralized directory of orphanages or donation centers.
- Fear that donations are not used correctly.
- Finding, contacting and delivering donations can take a long time.

Safe Haven was born with a clear mission: connecting the donors and orphanages with security, ease and impact. By providing a centralized platform, our goal is to simplify the donation process, create awareness of donation platforms, promote trust and create an effort promoted by the community to address social needs in Sialkot.

- **Where to donate:** no unique and reliable source lists all donation centers and orphanages in Sialkot. This forces donors to trust mouth-to-mouth or incomplete online information.
- **What specific needs exist:** donors often do not know what is required: money, clothing, school supplies or food. This lack of clarity discourages them from taking the next step.
- **Effective use of donations:** even after donating, people care that their contributions were used correctly or had a real impact.

The platform is based on trust and transparency, especially when it comes to administering donations. Users can log in safely and obtain personalized donation recommendations based on what orphanages need.

1.2 Background Research

Safe Haven's idea comes from the growing need to support orphanages in the management of their resources and connect with donors effectively. In many areas, orphanages lack digital platforms to show their requirements, which makes it possible for taxpayers to arrive.

Traditional fundraising methods often do not reach a broader audience, leaving the critical unsatisfied needs. The growing availability of Internet access presents an opportunity to close this gap through technology. Therefore, creating a centralized online platform became an essential solution to address these challenges.

Orphanages often face problems such as inconsistent funds and lack of visibility. These challenges can be mitigated by taking advantage of digital tools that simplify communication and resource management.

The research indicates that online platforms that offer transparency and ease of access tend to increase the confidence and commitment of donors. In addition, such platforms can highlight the needs in real-time and allow donors to contribute in a focused and impressive way. This understanding inspired the development of Safe Haven, which combines these elements in a single cohesive solution.

The existing systems to administer donations and donor efforts are fragmented or depend largely on manual processes. These inefficiencies lead to wasted resources and lost opportunities for collaboration. When studying successful non-profit models and analyzing the gaps in current approaches, it became clear that technology-driven solutions could transform how orphanages work.

1.3 Problem Statement

In Sialkot, numerous orphanages and donation centers strive to support vulnerable children and disadvantaged communities. However, the lack of centralized communication and coordination between donors, orphanages and donation centers leads to inefficiencies, resulting in unattended needs and unequal distribution of resources.

Potential donors often face significant challenges in the identification of accredited organizations, including their specific needs and guarantee that their contributions reach the planned beneficiaries. Without a simplified platform, donors can have difficulties:

- Access to updated and verified information about donation centers and orphanages.
- Know what articles or funds are needed more urgently.
- Manage and track your donations effectively.

On the other hand, donation centers and orphanages experience difficulties such as:

- Communicate your immediate and continuous needs to a broad audience.
- Maintain transparency and responsibility, which are criticism to build donor confidence.
- Reach possible donors beyond their immediate geographical or social networks.

This lack of a transparent and optimized donation process results in:

- Wasting resources due to an excess of offer of less necessary items or contributions insufficient to high priority needs.
- Reduction of trust among donors due to concerns about fraud or poor management.
- Lost opportunities to support vulnerable populations effectively.

1.4 Objectives

- **Donation writing and fundraising:**
Safe Haven has simplified donations and fundraising with options such as unique, recurring or specific contributions to specific programs such as education or medical care.
- **Transparency and responsibility:**
The platform guarantees the confidence of donors by providing detailed financial breakdowns, showing exactly how funds are assigned and used.
- **Facilitate the visibility and consciousness of the orphanage:**
The detailed orphanage profiles highlight the needs, stories and achievements, helping donors make informed decisions.
- **Creation of a scalable and sustainable platform:**
With sponsorship programs and organizational associations, Safe Have guarantees long-term sustainability and space for growth.
- **Incorporation of localized solutions for greater accessibility:**
The platform offers local payment options, language support and culturally relevant characteristics to guarantee accessibility for various users.
- **Location-based orphanage search:**
A manual or enabled search for GPS helps users find orphanages nearby, improving accessibility and convenience.
- **Donation portal for financial support:**
A safe online donation system allows users to contribute directly to orphanages, with transparent follow-up of funds.
- **Orphanage reviews and grades:**
Users can leave reviews and grades, promote transparency and help others evaluate the quality of care provided by orphanages.

1.5 Scope of study

The scope study for this project is to address the problem of locating orphanages, donation and well-being centers through an easy web platform. Development focuses on providing an easy experience to use for individuals, families, organizations and companies interested in donating.

The system will simplify the orphanage location process and make donations, which are currently taken and inefficient for users. All orphanages that appear on the platform will be required to maintain their profiles with precise and updated information, ensuring that users have access to reliable details about each orphanage.

The project will focus on improving the usability of the web-based system in terms of user and navigation interface, which facilitates users to interact with the platform. The system will be developed using modern web technologies, including a receptive design to guarantee accessibility on several devices, and will present functionalities such as a safe donation portal.

1.6 Success Criteria

Table 2 Project Success Criteria

Success Criteria	Description
Fully Functional Web Platform	The system is developed, deployed, and operational, enabling users to locate orphanages, make donations, and access relevant information seamlessly.
User-friendly Interface	The platform features an intuitive and accessible design with clear navigation, ensuring a positive user experience across desktops and mobile devices.
Secure Donation and Registration Process	Donation signups are processed securely through encrypted payment gateways and protected user authentication methods.
Accurate and up-to-date information	Orphanage profiles and donation needs are consistently updated to provide users with reliable and current information.
Effective Search and Filtering	Users can efficiently search and filter orphanages based on location, needs, type of support required, and urgency.
High User Engagement	The platform achieves active participation from donors, and orphanages, measured through user signups and donations made.
Transparency and Trust	Features like donation tracking, orphanage reviews, and real-time updates ensure transparency, building trust among users.
Scalability and Performance	The system maintains high performance under varying user loads and is designed to scale for future expansion to more regions and orphanages.
Positive User Feedback	User satisfaction is validated through surveys and feedback forms, focusing on ease of use, reliability, and overall experience.
Compliance and Security Standards	The platform complies with relevant legal regulations (e.g., data privacy laws) and follows security best practices to protect user data and transactions.

1.7 Risks & Obstacles

1. Data Security Risks

- Potential data breaches or unauthorized access to sensitive user information, including donation details and personal data.
- Risk of financial fraud or misuse during online transactions if security protocols fail.

2. User Trust and Engagement

- Difficulty in gaining user trust due to concerns over transparency, data privacy, and the authenticity of listed orphanages.
- Low user engagement resulting from poor user interface or lack of compelling features.

3. Orphanage Participation

- a. Challenges in encouraging orphanages to actively maintain and update their profiles with accurate and up-to-date information.
- b. Lack of digital literacy among orphanage staff, leading to ineffective use of the platform.

4. Technical Challenges

- a. Performance issues such as slow load times or server crashes during peak usage periods.
- b. Integration difficulties with third-party services like payment gateways and mapping APIs.

5. Legal and Compliance Issues

- a. Failure to comply with local data protection regulations and donation laws could result in legal penalties.
- b. Ensuring all transactions are transparent and meet the legal standards for charitable contributions.

6. Scalability and Maintenance

- a. Difficulty in scaling the platform to accommodate more users and orphanages without impacting performance.
- b. High maintenance requirements that could strain available resources post-deployment.

7. Internet Connectivity Issues

- a. Users in remote areas or orphanages with poor internet connectivity may face challenges accessing the platform.
- b. Slow or unreliable connections could impact real-time features like donation tracking and updates.

1.8 Assumptions

- **Internet Connectivity** – Users (donors, and orphanages) will have access to a stable internet connection to interact with the platform.
- **User Digital Literacy** – Users will have basic digital literacy skills to navigate the web platform, register, and perform relevant actions such as donations, and searching for orphanages.
- **Genuine Orphanage Registration** – All orphanages registering on the platform will provide valid and truthful information regarding their organization, needs, and services.
- **Secure Transactions** – All financial transactions will be processed through secure and trusted payment gateways to ensure donor safety and prevent fraud.
- **Orphanage Participation** – Orphanages will actively maintain their profiles, update donation needs, and respond to donors in a timely manner.
- **Compliance with Legal and Security Standards** – The platform will adhere to data protection laws and industry security standards to ensure user privacy and system security.

- **Scalability & Performance** – The system will be designed to handle a growing number of users and orphanages without significant performance issues.
- **Mobile Responsiveness** – The web application will be fully responsive and optimized for use on mobile devices, ensuring accessibility across different screen sizes.
- **Timely Content Updates** – Orphanage data and donation needs will be updated regularly to ensure users receive accurate and relevant information.
- **Third-party API Availability** – The platform will rely on third-party services such as Google Maps, email notifications, and payment gateways, assuming their continued availability and functionality.

1.9 Stakeholders & Their Interests

- **Donors**
 - **Interests:** Donors seek a trustworthy and transparent platform where they can easily contribute funds or goods to orphanages. They are interested in tracking their donations, understanding how their contributions are utilized, and ensuring their help reaches the intended beneficiaries.
- **Orphanages**
 - **Interests:** Orphanages aim to gain visibility and connect with potential donors. They require a simple way to update their profiles, list needs and manage donations. Transparency and timely support are crucial for their operations.
- **Nongovernmental Organizations (NGOs) & Charities**
 - **Interests:** NGOs and charities may use the platform to run awareness campaigns, organize donation drives, and collaborate with orphanages. They are interested in transparency, partnership opportunities, and access to donor networks.
- **Businesses & Corporate Sponsors**
 - **Interests:** Companies interested in corporate social responsibility (CSR) may use the platform to sponsor orphanages. They seek visibility for their contributions and ways to engage their employees in charitable activities.
- **General Public**
 - **Interests:** Individuals who are not directly involved in donating may still use the platform to stay informed about awareness campaigns, and community engagement opportunities.

1.10 Tools, Libraries and Technologies with Reasoning

Table 3 Tools Technologies and Libraries

Tools <
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1.11 Work Division

Table 4 work division

Sr. No	Roll Number	Name	Role Assignment & Work Division
1.	069606	SOFIA	Main Backend Developer(Sub Frontend Developer, Designer and Database Developer)
2.	069605	UMAIRA	Main Frontend Developer
3.	069565	NOOR	Main Database Developer and Frontend Designer(Sub Frontend Developer and Backend Developer)

1.12 Summary

The first chapter provides a comprehensive foundation for understanding the Safe Haven project by outlining its purpose, objectives, and key considerations. It begins with an introduction to the platform, explaining its significance in connecting donors, and orphanages.

The background research highlights the existing challenges in the orphanage support system, emphasizing the need for a centralized and transparent platform. The problem statement clearly defines the gaps that Safe Haven aims to address, while the objectives outline the specific goals of the project. The scope of the study sets boundaries on the system's functionality, ensuring clarity on what the platform will deliver.

Furthermore, the chapter discusses the success criteria, which define the essential features required for the system's acceptance. It also identifies potential risks and obstacles, providing insight into challenges that may arise during development. The assumptions clarify the conditions under which the system is designed, ensuring realistic expectations.

Additionally, the chapter outlines the key stakeholders and their interests, ensuring that the platform meets the needs of all users. The selection of tools, libraries, and technologies is justified based on project requirements, ensuring efficiency and maintainability. Lastly, the work division details how responsibilities are distributed among team members to facilitate smooth development. This chapter serves as the foundation for the rest of the document, guiding the project toward successful implementation.



CHAPTER 2

LITERATURE REVIEW

2.1 Literature Review Findings

1. Challenges in Orphanage Support Systems

Traditional orphanage support platforms often struggle with transparency, leading to trust issues among donors. Many systems don't offer real-time updates on donations or the specific needs of orphanages, which can result in inefficient resource distribution and miscommunication between donors and orphanages.

2. Importance of Web-Based Donation Platforms

Web-based donation systems have proven to be highly effective in simplifying the donation process. These platforms provide users with the flexibility to donate, or even adopt from any location, significantly improving accessibility and encouraging greater community involvement and donor participation.

3. User Experience and Engagement

A smooth and user-friendly interface is essential for keeping users engaged. Research highlights that features like easy navigation, advanced search filters, and instant notifications play a major role in enhancing user satisfaction and encouraging repeated use of donation platforms.

4. Security and Privacy Concerns

Security remains a top priority for any donation-based platform. Studies emphasize that without proper safeguards, issues like data breaches and fraudulent activities can harm donor trust. Secure payment systems, encrypted data, and robust authentication processes are crucial to protect both donors and orphanages.

5. Gamification and Community Building

Introducing gamification elements such as badges, leaderboards, and rewards has been shown to increase user engagement and motivation. Additionally, features that encourage community involvement—like user reviews, social media sharing, and awareness campaigns—help build a supportive network around orphanages.

6. Limitations in Existing Platforms

Many existing donation and orphanage locator platforms face challenges with scalability, especially during high-traffic periods. There's also often a lack of detailed, UpToDate orphanage profiles, making it harder for donors to make informed decisions about where to direct their contributions.

7. Adoption of Modern Technologies

Research supports the use of modern web technologies to enhance the functionality and accessibility of donation platforms. Features like responsive design, real-time data updates, and mobile compatibility ensure users can access and interact with the platform smoothly across different devices.

2.2 Related Work

- 1- Several digital platforms have been developed to support orphanages and orphaned children.
 - **Africa's Orphans Support Platform** enables direct crowdfunding with a focus on transparency. Safe Haven simplifies the donation process by connecting donors to orphanages efficiently.
 - **The Miracle Foundation** works globally to transition children from institutions to family care
 - **The World Orphan Fund** ensures that all donations go directly to helping orphans, promoting trust and transparency.
- 2- Here are some notable digital platforms and organizations in Pakistan dedicated to supporting orphaned children:
 - **Alkhidmat Foundation's Orphan Care Program**
The program provides financial support for education and daily expenses to orphaned children aged 16 or below, ensuring their comprehensive mental, social, and moral development.
 - **Pakistan Sweet Home**
Pakistan Sweet Home supports nearly 4 million orphans in Pakistan by providing shelter, education, and healthcare through its nationwide centres.
 - **Khubaib Foundation's Orphan Care Program**
Khubaib Foundation provides orphans with education, shelter, healthcare, and compassionate care through its orphanages and educational institutions.
 - **The Pakistan Orphan Project**
This project aims to improve the lives of orphaned children in Pakistan by providing access to education, healthcare, and essential resources.
 - **Abbasi Welfare Foundation**
Abbasi Welfare Foundation, a nonpolitical organization in Pakistan, supports communities through shelter, healthcare, education, and orphan care initiatives.
 - **AlMustafa Welfare Society's Orphan Sponsorship Program**
AlMustafa Welfare Society's orphan sponsorship program supports orphans' growth by addressing their psychological, emotional, and basic needs to help them overcome past hardships.
 - **Edhi Foundation**
As a major charitable organization in Pakistan, Edhi Foundation runs several services, including childcare and hospitals.

2.3 Gap Analysis

2.3.1 Market Solutions and Their Limitations

- **Pakistan Sweet Home**
 - **Solution:** Provides shelter, education, and healthcare to orphans through centers across Pakistan.
 - **Limitations:** Limited online donor engagement and lacks a comprehensive digital platform for real-time donations and tracking.
- **Edhi Foundation**
 - **Solution:** One of Pakistan's largest nonprofit organizations offering shelter and care for orphans alongside other humanitarian services.
 - **Limitations:** Minimal online presence for orphanage-specific donations, with no dedicated platform for tracking donations or connecting donors directly to orphanages.
- **SOS Children's Villages Pakistan**
 - **Solution:** Offers family-based care for orphans and abandoned children, along with education and vocational training.
 - **Limitations:** While it has an online donation system, it lacks features like real-time orphanage needs, donation tracking, and transparency in fund utilization.
- **GoFundMe & Global Giving**
 - **Solution:** Global crowdfunding platforms that support orphanages through donation campaigns.
 - **Limitations:** High service fees, lack of localized focus, and limited transparency on fund allocation specific to orphanages.

2.3.2 Challenges in Current Systems

1. **Lack of Transparency:**

Donors often lack insight into how their contributions are used, leading to mistrust due to the absence of clear tracking and feedback mechanisms.
2. **Inefficient Donation Processes:**

Complex forms, unresponsive interfaces, and transaction issues make the donation process time-consuming and discourage potential donors.
3. **Poor User Engagement and Retention:**

Without interactive features like notifications or gamification, users lose interest quickly, leading to low engagement and donor retention.
4. **Limited Accessibility:**

Platforms lacking mobile responsiveness, language support, or accessibility features exclude users with diverse needs and devices.
5. **Inadequate Security and Privacy:**

Weak encryption and unsecured payment gateways expose users to data breaches and fraud, deterring them from sharing sensitive information.

2.3.3 Unique Approach of Safe Haven

1. **Comprehensive Orphanage Profiles:**

Detailed, verified profiles provide real-time updates on orphanage needs, facilities, and projects, fostering transparency and informed contributions.

2. **Interactive Orphanage Locator:**

A map-based locator with advanced filters helps users find nearby orphanages based on location, needs, and urgency.

3. **Seamless Donation Process:**

Secure payment gateways to make donating quick, with real-time confirmations and progress tracking.

4. **Enhanced Security and Privacy:**

The platform ensures data safety with encrypted payments, multifactor authentication, and secure user data storage.

5. **Gamification for Increased Engagement:**

Badges, leaderboards, and rewards motivate users to stay engaged and recognize their ongoing contributions.

2.4 Summary

This chapter explored the literature review to establish a foundation for the Safe Haven platform. It began with literature review findings, which examined existing research on donation platforms, and orphanage support solutions. Key studies and industry best practices were analyzed to understand how similar systems function and the challenges they face.

The related work section provided an overview of existing platforms and technologies that facilitate charitable donations, and orphanage support. The gap analysis highlighted the shortcomings of current solutions, including lack of transparency, inefficient donation tracking, and limited engagement for donors.

It examined market solutions and their limitations, identified challenges in current systems, and demonstrated how Safe Haven offers a unique approach by integrating gamification, real-time tracking, and AI-driven analytics to improve user engagement and donation management. This analysis justifies the necessity of Safe Haven and reinforces its potential impact in bridging existing gaps in the orphanage support ecosystem.



CHAPTER 3

PROJECT PLANNING

3.1 Requirements Analysis

The Requirements Analysis of Safe Haven involves identifying key functional and nonfunctional needs to ensure an efficient and secure donation platform. Functional requirements include user authentication, orphanage verification, donation tracking, and a needs listing system to facilitate targeted contributions.

The platform must support real-time updates, secure payment processing, and communication features for donors and orphanages. Nonfunctional requirements focus on security, scalability, usability, and performance, ensuring a trustworthy, user-friendly, and efficient system. The goal is to create a seamless, transparent, and impactful platform that simplifies the donation process while fostering community engagement.

3.2 User classes and characteristics

Table 5 User Classes and their Characteristics

User Class	User Characteristics
Donor	Individuals or organizations willing to donate money, food, clothes, or other essentials. They require a transparent and secure system to ensure their contributions reach the right orphanage.
Orphanage Admin	Representatives managing orphanages who list needs, receive donations and verify transactions. They require a user-friendly interface for updating orphanage profiles and responding to donors.
General User	Individuals exploring the platform for awareness or future contributions. They may not register immediately but require access to orphanage details and donation impact reports.
Admin	Platform administrators are responsible for user verification, orphanage approvals, monitoring donations, and ensuring system security and smooth operation.

3.3 Requirement Identifying Techniques

1. Stakeholder Interviews

- Conduct one-on-one or group interviews with donors, orphanage representatives, and administrators to understand their needs, pain points, and expectations.
- Example: Asking orphanages about the challenges they face in receiving donations.

2. Surveys & Questionnaires

- Collect data from potential users through online surveys to understand donation habits, security concerns, and preferred features.
- Example: Asking donors if they prefer monetary donations or physical goods.

3. Document Analysis

- Review existing orphanage records, donation receipts, and financial reports to understand donation trends and regulatory requirements.
- Example: Analyzing reports from NGOs on donation fraud prevention.

3.4 Functional Requirements

Functional Requirements Specification for User Registration & Authentication

Table 6 Functional Requirements Specification for User Registration

Identifier	FR1
Title	User Registration & Authentication
Requirement	The system shall allow users (donors, orphanages, and admins) to register and log in securely using email and password authentication. Users shall also be able to recover passwords if forgotten.
Source	Project Stakeholders, Security Compliance Standards
Rationale	Ensures secure user access and prevents unauthorized use of the platform.
Business Rule (if required)	Users must verify their email before accessing full platform functionalities.
Dependencies	FR2 (User Profiles), FR8 (Admin Dashboard)
Priority	High

Functional Requirements Specification for User Profile

Table 7 Functional Requirements Specification for User Profile

Identifier	FR2
Title	User Profiles
Requirement	The system shall allow users to create, update, and manage their profiles, including personal information and donation history.
Source	User Needs Analysis
Rationale	Enables personalization and helps track user activities on the platform.
Business Rule (if required)	Users must provide valid information; admins can suspend incomplete or fraudulent profiles.
Dependencies	FR1 (User Registration), FR5 (Donation Management)
Priority	High

Functional Requirements Specification for Orphanage Registration

Table 8 Functional Requirements Specification for Orphanage Registration

Identifier	FR3
Title	Orphanage Registration
Requirement	The system shall allow orphanages to register and create profiles, listing their needs, location, and contact information.
Source	Orphanage Administrators, Platform Guidelines
Rationale	Enables donors to find and support orphanages efficiently.
Business Rule (if required)	Orphanages must submit verification documents before approval.
Dependencies	FR8 (Admin Dashboard), FR4 (Orphanage Listing)
Priority	High

Functional Requirements Specification for User Orphanage Listing & Search

Table 9 Functional Requirements Specification for User Orphanage Listing

Identifier	FR4
Title	Orphanage Listing & Search
Requirement	The system shall display a list of verified orphanages and allow users to search and filter by location, needs, and ratings.
Source	User Experience Research
Rationale	Simplifies the process of finding and supporting orphanages.
Business Rule (if required)	Only verified orphanages will appear in search results.
Dependencies	FR3 (Orphanage Registration)
Priority	High

Functional Requirements Specification for Donation Management

Table 10 Functional Requirements Specification for Donation Management

Identifier	FR5
Title	Donation Management
Requirement	The system shall allow users to donate money or in-kind items to orphanages and receive confirmation receipts.
Source	Donor Feedback, Legal Compliance
Rationale	Ensures a structured donation process with transparency.
Business Rule (if required)	Donors must receive confirmation from the orphanage after a successful donation.
Dependencies	FR3 (Orphanage Registration), FR4 (Orphanage Listing)
Priority	High

3.5 Non-Functional Requirements

1. Reliability

- The system shall ensure 99.5% uptime to provide continuous access to donors and orphanages.
- The Mean Time Between Failures (MTBF) should be at least 500 hours to minimize unexpected downtime.

- In case of failure, the system shall ensure a Mean Time to Recover (MTTR) of fewer than 30 minutes for critical services.

2. Performance Efficiency

- The system shall handle at least 500 concurrent users without performance degradation.
- Page loading time should not exceed 3 seconds under normal traffic conditions.
- Donation transactions shall be processed in less than 5 seconds.

3. Security

- All user data, including donation details, shall be encrypted using AES256 encryption.
- The system shall use JWT-based authentication to secure user sessions.
- User passwords shall be stored hashed and salted to prevent unauthorized access.
- The platform must be protected against SQL Injection, CrossSite Scripting (XSS), and CrossSite Request Forgery (CSRF).
- Access to sensitive data shall be restricted based on role-based access control (RBAC).

4. Usability

- The platform shall maintain a user-friendly interface, ensuring that at least 85% of first-time users can navigate without guidance.
- The system should be mobile responsive, providing a seamless experience across different screen sizes.
- A search and filter feature shall allow users to find orphanages and donation opportunities efficiently.

5. Maintainability & Scalability

- The platform should be modular, allowing easy updates and feature additions without impacting existing functionality.
- The system must scale to accommodate a 50% increase in users annually without requiring major infrastructure changes.
- The database shall support efficient indexing and query optimization to handle growing data.

6. Availability

- The system shall ensure 24/7 availability except during scheduled maintenance periods.
- Users shall receive advance notifications (at least 48 hours) for scheduled maintenance.
- The platform must have failover mechanisms to redirect users in case of unexpected downtime.

7. Legal & Compliance

- The system shall comply with GDPR and local data protection laws to ensure user privacy.
- All financial transactions must adhere to PCI DSS (Payment Card Industry Data Security Standard) regulations.

- Donation receipts must be tax-compliant based on local government policies.

3.6 External Interface Requirements

3.6.1 User Interface Requirements

The Safe Haven platform is designed to provide an intuitive, accessible, and responsive user experience for donors, orphanages, and administrators. It follows industry best practices to ensure usability, accessibility, and consistency across different devices.

1. General UI Standards

- **Design:** Follows **Material Design** for consistency.
- **Typography:** Uses Century Gothic with a minimum **14px font size** for readability.
- **Icons & Buttons:** Standardized icons (**Material Icons/FontAwesome**), clear and action-oriented labels.
- **Color Scheme:** Calming **blue & green** shades with **WCAG 2.1 contrast compliance** for accessibility.

2. Layout & Navigation

- **Responsive Design:** Supports screens from **360px (mobile) to 1920px (desktop)**.
- **Navigation:** Fixed **top navigation bar** with a **hamburger menu**.
- **UI Elements:** Header (**logo, navigation, hamburger**) & Footer (**contact info, social media links**) on every page.

3. Standard Buttons & Functions

- **Primary Actions:** "Donate Now," "Subscribe for Updates."
- **Secondary Actions:** "Learn More," "Contact Us," "View Details."
- **Keyboard Shortcuts:** Tab (move fields), Enter (submit), Esc (close modals).

4. Message Display & Feedback

- **Success (Green):** "Donation successfully processed!"
- **Error (Red):** "Invalid email address. Please try again."
- **Toast Notifications:** Quick, nonintrusive status updates.

3.6.2 Software Requirements

1. Frontend Requirements

- **Programming Languages:** JavaScript
- **Frameworks & Libraries:** React.js (or Next.js)
- **Styling & UI Components:** CSS
- **Responsive Design:** Flexbox, Grid

2. Backend Requirements

- **Programming Language:** Node.js
- **Framework:** Express.js (for building RESTful APIs)

3. Authentication & Authorization:

- JWT (JSON Web Tokens) for secure user authentication
- Google OAuth / Facebook Login (for social authentication)

4. Database & Storage Requirements

- **Database:** MongoDB
 - **ORM/ODM:** Mongoose
 - **Cloud Storage:** AWS S3, Firebase Storage
5. **External APIs & Services**
- **Payment Processing:** local payment gateway
 - **Mapping & Location Services:** Google Maps API or OpenStreetMap for orphanage locations
 - **Email & Notifications:** Nodemailer (for sending emails)
 - **SMS Services:** a local SMS provider (for alerts and confirmations)
6. **Security & Data Protection**
- **Encryption:** SSL/TLS for secure communication
 - **Data Validation:** Joi / Yup (for backend input validation)
 - **Access Control:** Role-based access control (RBAC) implementation
 - **Backup & Recovery:** Automatic database backups using AWS RDS or Firebase Firestore Backup
7. **Development & Deployment Tools**
- **Version Control:** Git & GitHub
 - **CI/CD:** GitHub Actions
8. **Hosting & Deployment:**
- Vercel / Netlify (for frontend hosting)
 - AWS EC2 / Heroku (for backend deployment)
 - PostgreSQL / MongoDB Atlas (for cloud database hosting)

3.6.3 Hardware Interfaces

Description: Defines the interaction between Safe Haven and external hardware components.

- **Server Requirements:**
 - The system shall be hosted on a cloud-based server (e.g., AWS, Azure, or Google Cloud) for scalability.
 - The backend shall run on Node.js and Express.js with MongoDB for data storage.
- **Payment Processing:**
 - The platform shall integrate with POS terminals or QR codes for in-person donations at orphanages.
- **Security Devices:**
 - Supports integration with biometric authentication devices if required for orphanage verification in the future.

3.6.4 Communication Interfaces

a) **Description:** Defines how the system interacts with users through messaging and alerts.

- **RealTime Chat:**
 - The system shall provide a chat feature for communication between donors and orphanages.
- **Email & SMS Notifications:**
 - Users shall receive notifications for donation requests, and transaction confirmations.
- **Community Forum:**
 - A discussion board for donors, and orphanages to share experiences

3.7 Use Case Analysis

Table 11 User Registration & Authentication

UC Identifier	UC1
Requirements Traceability	FR1 (User Registration & Authentication)
Purpose	Allow users (donors, orphanages, and admins) to securely register and log into the system.
Priority	High
Preconditions	Users must have a valid email address or social media account.
Postconditions	A user account is created, and the user is logged in.
Actors	Donor, Orphanage, Admin
Extends	N/A
Main Success Scenario	1. User navigates to the registration page. 2. User fills in personal details and selects the user type. 3. User submits the registration form. 4. System sends a verification email. 5. User verifies email and logs in successfully.
Alternate Flows	1a. User opts for social login via Google/Facebook. 2a. System redirects to social authentication service. 3a. Upon successful authentication, system logs in the user.
Exceptions	E1: If the email is already registered, the system displays an error message. E2: If the verification email is not received, the user can request a resend.

Table 12 Organization Registration

UC Identifier	UC2
Requirements Traceability	FR3 (Organization Registration)
Purpose	Allow orphanages and donation centers to register, verify their authenticity, and create profiles.
Priority	High
Preconditions	Orphanage must provide valid registration details and documents.
Postconditions	Orphanage profile is created and displayed on the platform.
Actors	Orphanage Representative, Admin
Extends	UC1 (User Registration & Authentication)
Main Success Scenario	<ol style="list-style-type: none"> 1. Orphanage representative fills out the registration form. 2. Uploads verification documents. 3. Submit the form. 4. Admin reviews and approves the registration. 5. Organization profile is activated.
Alternate Flows	<ol style="list-style-type: none"> 4a. If documents are unclear, the admin requests additional verification. 4b. Orphanage resubmits documents.
Exceptions	<p>E1: If invalid documents are uploaded, the system rejects the registration.</p> <p>E2: If the organization is already registered, the system displays an error.</p>
Includes	UC3 (Admin Verification)

Table 13 Donation Management

UC Identifier	UC3
Requirements Traceability	FR7 (Donation Management)
Purpose	Enable donors to contribute monetary and in-kind donations to orphanages.
Priority	High
Preconditions	Donors must be logged in and have valid payment details (if making a monetary donation).
Postconditions	The donation is recorded, and the donor receives confirmation.
Actors	Donor, Orphanage Representative, Admin
Extends	N/A
Main Success Scenario	<ol style="list-style-type: none"> 1. Donor selects an orphanage. 2. Chooses a donation type (money or items). 3. Enters donation details. 4. The system processes the transaction. 5. Orphanage receives donation notification. 6. System updates donation tracking.
Alternate Flows	<ol style="list-style-type: none"> 3a. Donor cancels the donation before submission. 4a. If donating items, donor arranges delivery.

Exceptions	E1: Payment failure due to insufficient funds. E2: System rejects donation if required details are missing.
Includes	UC4 (Transaction Processing)

Table 14 Gamification Features

UC Identifier	UC4
Requirements Traceability	FR2 (Gamification Features)
Purpose	Encourage donor engagement through badges, points, and leaderboards.
Priority	Low
Preconditions	User must have performed donation activities.
Postconditions	User receives badges/points based on contributions.
Actors	Donor
Extends	N/A
Main Success Scenario	1. User donates. 2. System tracks the activity. 3. User earns points and badges. 4. Leaderboard updates.
Alternate Flows	3a. If a user reaches a milestone, system sends an achievement notification.
Exceptions	E1: System fails to update points due to a tracking issue.
Includes	UC6 (Notifications & Alerts)

Table 15 Location Based Orphanage Finder

UC Identifier	UC5
Requirements Traceability	FR14 (Location Based Orphanage Finder)
Purpose	Enable users to find nearby orphanages based on location.
Priority	High
Preconditions	User must grant location access or enter a location manually.
Postconditions	System displays orphanages near the user.
Actors	Donor
Extends	N/A
Main Success Scenario	1. User accesses the orphanage finder. 2. Allows location access or enters a location manually. 3. System retrieves orphanage data from the database. 4. Displays results on a map.
Alternate Flows	2a. User denies location access, enters location manually.
Exceptions	E1: No orphanages found in the entered location. E2: Location services fail to load.
Includes	UC7 (Search & Filters)

3.8 Use Case Diagram:

- **Actors:**
 - Donor
 - Orphanage Admin
 - Platform Admin
 - Guest User
- **Classes:**
 - **User** (Attributes: *userID, name, email, role, password*)
 - **Donor** (Inherits User)
 - **OrphanageAdmin** (Inherits User)
 - **Orphanage** (Attributes: *orphanageID, name, location, description, needsList*)
 - **Donation** (Attributes: *donationID, donorID, orphanageID, amount/type, date*)
 - **Payment** (Attributes: *paymentID, method (Easypaisa/JazzCash), status, transactionID*)

3.8.1 Use Case Diagram for Each Actor

Donor Use Cases

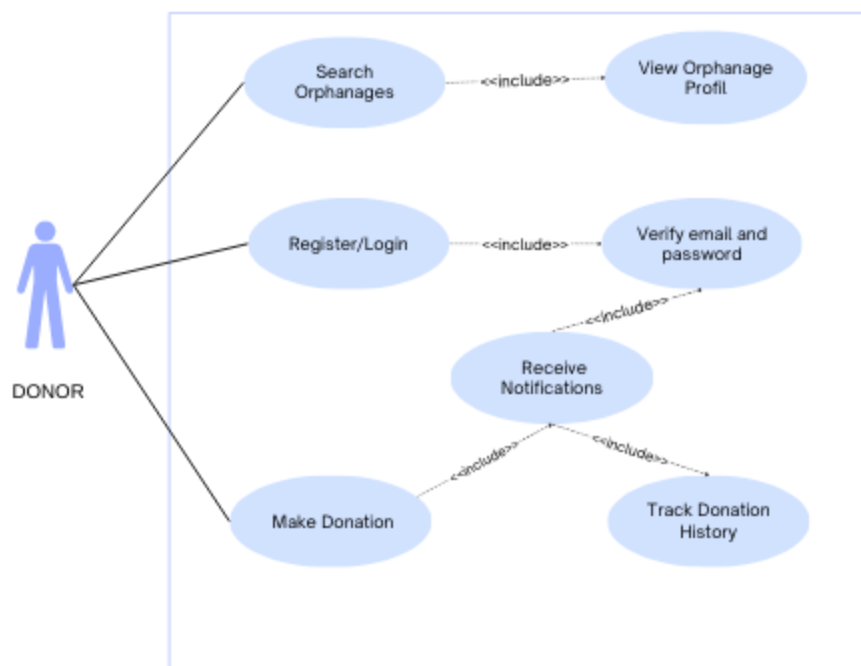


Figure 1 Donor Use Cases

- Register/Login
- Search Orphanages
- View Orphanage Profile
- Make Donation
- Track Donation History
- Receive Notifications

Orphanage Admin Use Cases

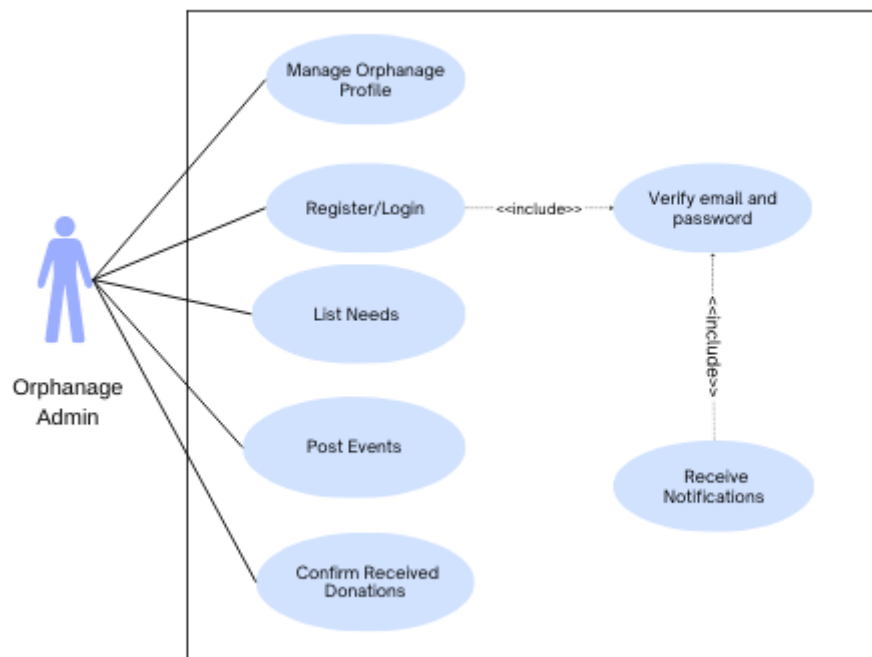


Figure 2 orphanage Admin Use Cases

- Register/Login
- Manage Orphanage Profile
- List Needs
- Confirm Received Donations

System Admin Use Cases

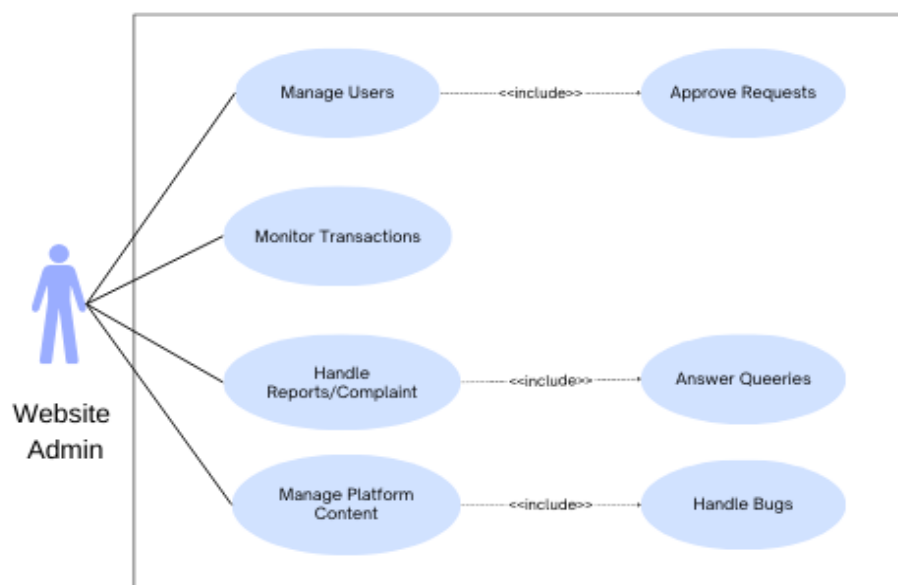


Figure 3 System Admin Use Cases

- Manage Users
- Monitor Transactions
- Handle Reports/Complaints
- Manage Platform Content

Guest User Use Cases

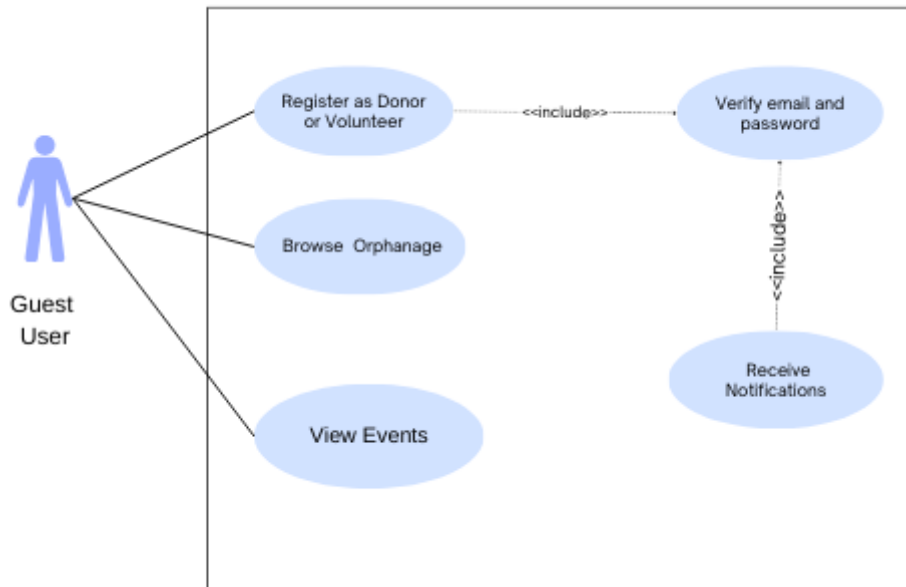


Figure 4 Guest User Use Cases

- Register as Donor
- Browse orphanage
- Read FAQ

3.9 Storyboard

1. Making a Donation

- User selects an orphanage from the list.
- System displays the orphanage's needs (money, clothes, food, etc.).
- User chooses the donation type and amount.
- System processes payment and provides confirmation.
- User receives a thankyou message and donation tracking information.

2. Submitting a Review for an Orphanage

- User visits the orphanage profile after making a donation.
- System provides an option to leave a review and rate the orphanage.
- User submits a review with comments.
- System verifies and displays the review on the orphanage profile.

3 Searching for an Orphanage

- User opens the Safe Haven platform.
- User enters a location or orphanage name in the search bar.
- User clicks the “Search” button.

- User applies filters (e.g., donation type, urgency, distance).
- User clicks on an orphanage profile for more details.
- User decides to proceed with a donation.

3.10 SUMMARY

The requirements identification and use case analysis for Safe Haven were conducted to ensure a well-structured and efficient system for connecting donors and orphanages. The process began with defining functional requirements, such as orphanage registration, donation tracking, and communication features.

Nonfunctional requirements focused on security, reliability, system performance, and accessibility to provide a seamless user experience. Each requirement was analyzed to align with project objectives, ensuring that the platform remains transparent, trustworthy, and easy to navigate.

Through use case analysis, user interactions were mapped, detailing system responses, preconditions, postconditions, and alternate flows. Key features like subscription management, donation processing, and communication systems were documented for clarity.

Additionally, storyboards were created to visualize user journeys, refining the design and usability. This structured approach ensures that *Safe Haven* effectively meets its mission of simplifying the donation process, increasing engagement, and fostering a sense of community driven support for orphanages.



CHAPTER 4

PROJECT DESIGNING

4.1 System Design

The Safe Haven platform is a web-based application designed to facilitate secure donations, and orphanage support through a centralized system. It operates as an interactive online platform, providing a structured way for users (donors, and orphanages) to connect, manage donations, and track contributions effectively. The system functions as an intermediary between donors, and orphanages, ensuring transparency and security in transactions.

4.1.1 Dependencies and Interactions with Other Systems

- **Authentication Services:** Integration with Google OAuth, Facebook Login, and JWT authentication ensures secure user login and account management.
- **Payment Gateways:** The platform supports Easypaisa, JazzCash and local payment providers to facilitate monetary donations securely.
- **Mapping & Location Services:** Uses Google Maps API or OpenStreetMap to help users locate orphanages.
- **Email & Notification System:** Implements Nodemailer for email notifications and Firebase Cloud Messaging (FCM) or One Signal for real-time alerts.
- **SMS Integration:** Uses a local SMS provider to send donation confirmations and urgent alerts.
- **Database Management:** Uses MongoDB (NoSQL) for efficient storage and retrieval of user data, donation history, and orphanage details.

4.1.2 Design Constraints

- **Performance Constraints**
 - The system must support high concurrency, handling multiple users accessing and performing transactions simultaneously.
 - Page load times should be under 3 seconds for optimal user experience.
 - Efficient database indexing and caching mechanisms must be implemented to enhance performance.
- **Security & Privacy Constraints**
 - All user data must be encrypted using SSL/TLS to ensure secure communication.
 - Compliance with GDPR and data privacy laws to protect donor and orphanage information.
 - Secure role-based access control (RBAC) must be implemented to restrict user permissions.
- **Scalability Constraints**
 - The platform should be scalable to accommodate an increasing number of users and orphanages without performance degradation.
 - Cloud based deployment (AWS, Azure, or Firebase) is preferred for flexible scaling.
- **Compatibility Constraints**
 - The system must be responsive and compatible with all modern browsers (Chrome, Firefox, Edge, Safari).

- It should work across desktop, tablet, and mobile devices without functionality loss.
- **Legal & Compliance Constraints**
 - The platform must comply with financial regulations for processing online donations.
 - Must provide terms of service and privacy policies to ensure ethical and legal operations.

4.2 Design Considerations

4.2.1 Assumptions

- Users have stable internet access and use modern web browsers (Chrome, Firefox, Edge, Safari).
- Local payment gateways (Easypaisa, JazzCash) will be available for processing transactions.
- External services like Google Maps API, Nodemailer (for emails), and Firebase/OneSignal (for notifications) will function reliably.
- The platform will be mobile friendly, supporting various screen sizes and devices.
- Users will adhere to secure authentication protocols using JWT tokens.

4.2.2 Limitations

- **Limited International Donations:** The reliance on local payment gateways restricts international donors unless additional global payment options are integrated.
- **API Rate Limits & Service Downtime:** The system depends on third-party APIs (Google Maps, Firebase, etc.), which may limit the number of requests or experience downtime.
- **Data Privacy & Customization:** Initial versions of the system may not support advanced data privacy features or extensive customization.
- **Performance on Low-end Devices:** While mobile friendly, some features **may not** work optimally on very old or low performance devices.
- **Regulatory Compliance Challenges:** Adhering to local and international financial regulations requires continuous updates and legal validation.

4.3 Requirement Traceability Matrix

Table 16 Requirement Traceability Matrix

Requirement ID	Scope	Requirement Description	Design Specification
FR1	User Registration & Authentication	The system shall allow users to register and log in securely using email and password authentication.	"User Authentication Module"
FR2	User Profiles	The system shall allow users to create, update, and manage their profiles.	"User Profile Management"
FR3	Orphanage Registration	The system shall allow orphanages to register and create profiles.	"Orphanage Registration Module"
FR4	Orphanage Listing & Search	The system shall display a list of verified orphanages and allow users to search and filter.	"Orphanage Listing & Search Engine"
FR5	Donation Management	The system shall allow users to donate money or in-kind items to orphanages.	"Donation Processing System"

4.4 Design Models

4.4.1 Design Class Diagram (DCD)

4.4.1.1 User Management Class Diagram

Description:

This class diagram represents the user management system, where users (donors, orphanages, and admins) can register, log in, and manage their profiles. The system enforces authentication and role-based access control.

Table Representation:

Table 17 User Management Class Diagram

Class Name	Attributes	Methods	Relationships
User	+id:String +name:String +email:String +password:String +role: String	+register():void +login():void +logout(): void	Generalization (Donor, Orphanage, Admin)
Donor	+donationHistory: List<Donation>	+donate(): void	Inherits User
Orphanage	+location: String +needs: List<String>	+updateNeeds(): void +receiveDonation(): void	Inherits User
Admin	+privileges: List<String>	+manageUsers(): void +approveOrphanage(): void	Inherits User

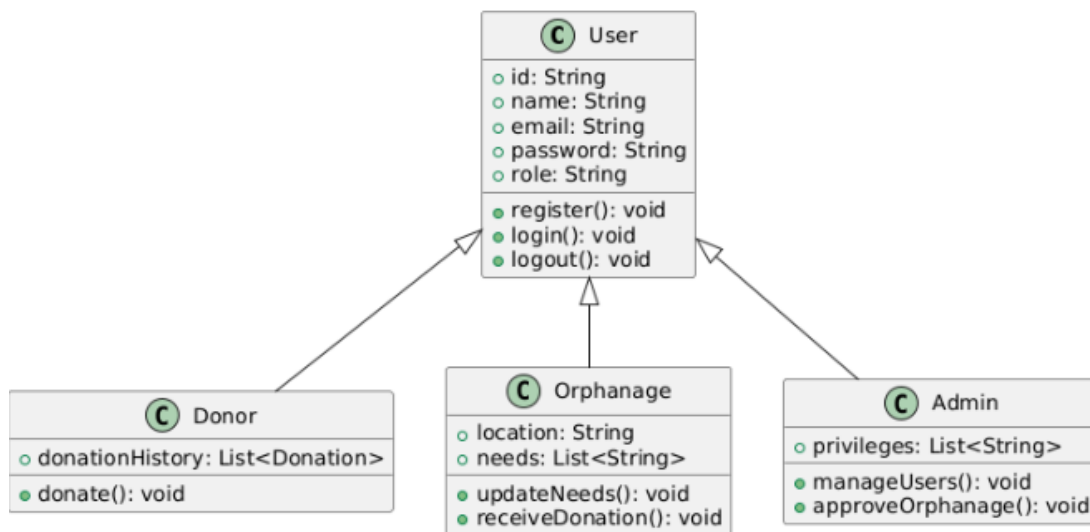


Figure 5 User Management Class Diagram

4.4.1.2 Donation Management Class Diagram

Description:

This class diagram models the donation process, where donors can contribute money or goods to orphanages. The system ensures secure transactions and donation tracking.

Table Representation:

Table 18 Donation Management Class Diagram

Class Name	Attributes	Methods	Relationships
Donation	+id: String +amount: Double +type: String +status: String	+confirmDonation(): void +trackDonation(): void	Association with Donor and Orphanage
Donor	+donationHistory: List<Donation>	+donate(): void	Association with Donation
Orphanage	+needs: List<String>	+receiveDonation(): void	Association with Donation
PaymentGateway	+provider: String	+processPayment(): void	Aggregation with Donation

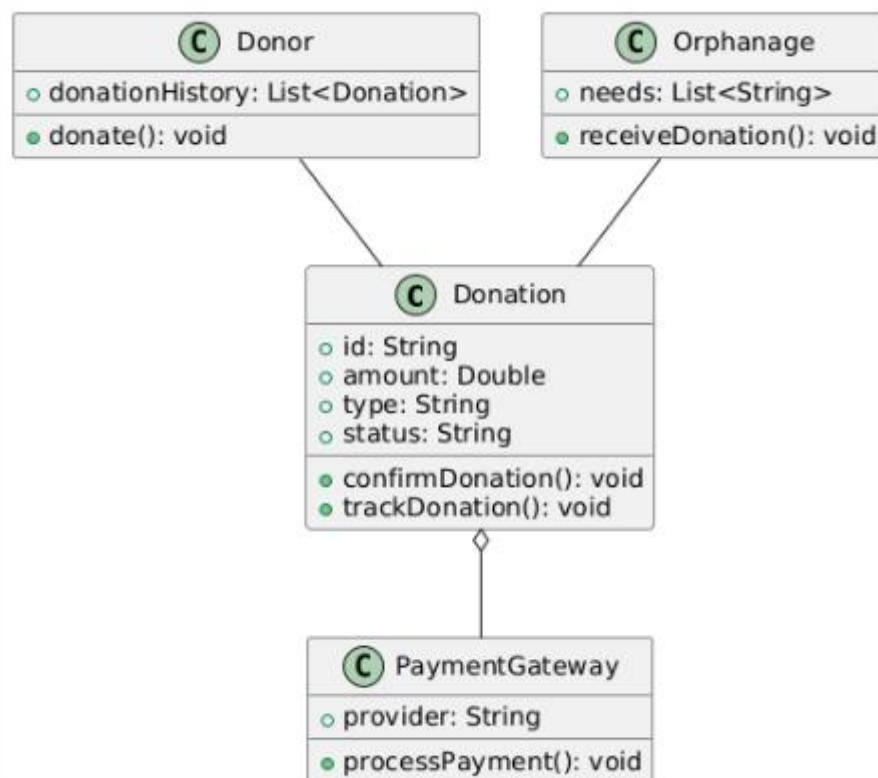


Figure 6 Donation Management Class Diagram

4.4.1.3 Notification System Class Diagram

Description:

This diagram represents the real-time notification system, ensuring that users receive updates about donations, new orphanages, and urgent needs.

Table Representation:

Table 19 Notification System Class Diagram

Class Name	Attributes	Methods	Relationships
Notification	+id: String +message: String +type: String +timestamp: DateTime	+sendNotification(): void	Association with User
User	+name: String +email: String	+receiveNotification(): void	Association with Notification
Notifier	+notificationList: List<Notification>	+triggerNotification(): void	Aggregation with Notification

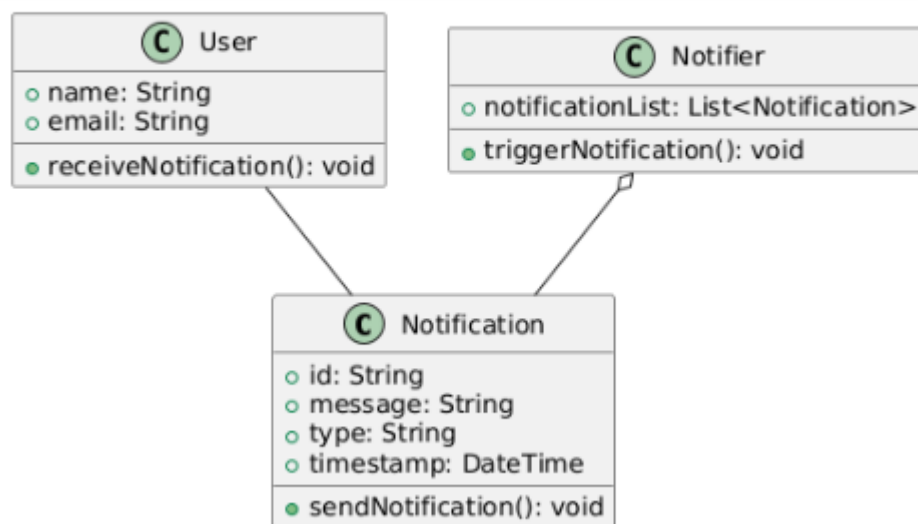


Figure 7 Notification System Class Diagram

4.4.1.4 Orphanage & Request Management Class Diagram

Description:

This class diagram represents the orphanage management and request system, where orphanages can register, update their details, and request specific donations. Donors can view and fulfill these requests.

Table Representation:

Table 20 Orphanage & Request Management Class Diagram

Class Name	Attributes	Methods	Relationships
Orphanage	+id: String +name: String +location: String +needs: List<String>	+updateProfile(): void +listNeeds(): void	Aggregation with Request
Request	+id: String +description: String +status: String +requestDate: DateTime	+approveRequest(): void +fulfillRequest(): void	Association with Donor and Orphanage
Donor	+id: String +name: String +donationHistory: List<Request>	+viewRequests(): void +fulfillRequest(): void	Association with Request
Admin	+id: String +privileges: List<String>	+approveOrphanage(): void +manageRequests(): void	Association with Orphanage and Request

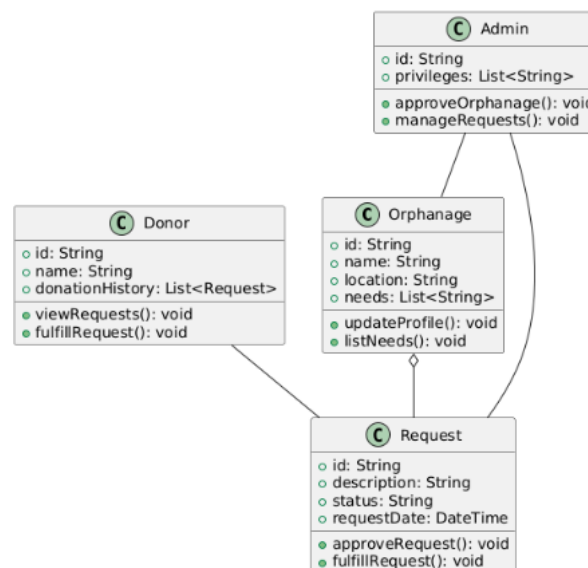


Figure 8 Orphanage & Request Management Class Diagram

4.4.1.5 Payment & Transaction Processing Class Diagram

Description:

This diagram represents the payment and transaction processing system, ensuring secure monetary donations via a payment gateway.

Table Representation:

Table 21 Payment & Transaction Processing Class Diagram

Class Name	Attributes	Methods	Relationships
Transaction	+id: String +amount: Double +status: String +timestamp: DateTime	+processTransaction(): void +verifyTransaction(): void	Association with Donor and PaymentGateway
Donor	+id: String +name: String	+donate(): void	Association with Transaction
Orphanage	+id: String +name: String	+receiveFunds(): void	Association with Transaction
PaymentGateway	+provider: String	+processPayment(): void	Aggregation with Transaction

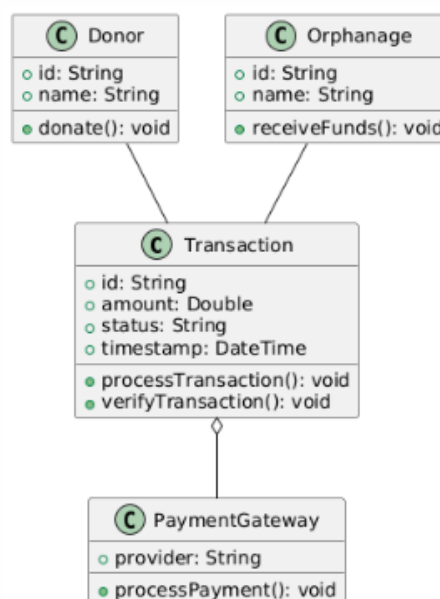


Figure 9 Payment & Transaction Processing Class Diagram

4.4.2 Interaction Diagram (Sequence diagram)

The UML Sequence Diagrams for Safe Haven illustrate the flow of interactions between users (donors, orphanages, es, and admins) and the system components. These diagrams map out how data moves within the system, ensuring smooth and efficient operations.

1. **User Registration & Login:** Shows how users register and log in, with backend validation and secure authentication.
2. **Orphanage Registration & Profile Update:** Details how orphanages sign up, create profiles, and update their needs.
3. **Donor Browsing & Donation:** Demonstrates how donors search for orphanages, make donations, and receive confirmations.
4. **Orphanage Needs Posting:** Describes how orphanages post their current needs, which donors can view and address.
5. **Admin Management:** Illustrates how admins manage users, approve profiles, and handle flagged content.
6. **Donation Tracking & Reporting:** Displays how donations are tracked, with reports available to donors and orphanages.
7. **Notification & Email Alerts:** Highlights how users receive notifications and emails about key activities and updates.
8. **Search & Filter Orphanages:** Shows the search process, allowing users to filter orphanages based on various criteria.
9. **Feedback & Reviews:** Depicts how users leave reviews for orphanages, enhancing transparency and trust.

4.4.2.1 Use Case Diagram for Each Actor

4.4.2.1.1 Admin Dashboard Management:

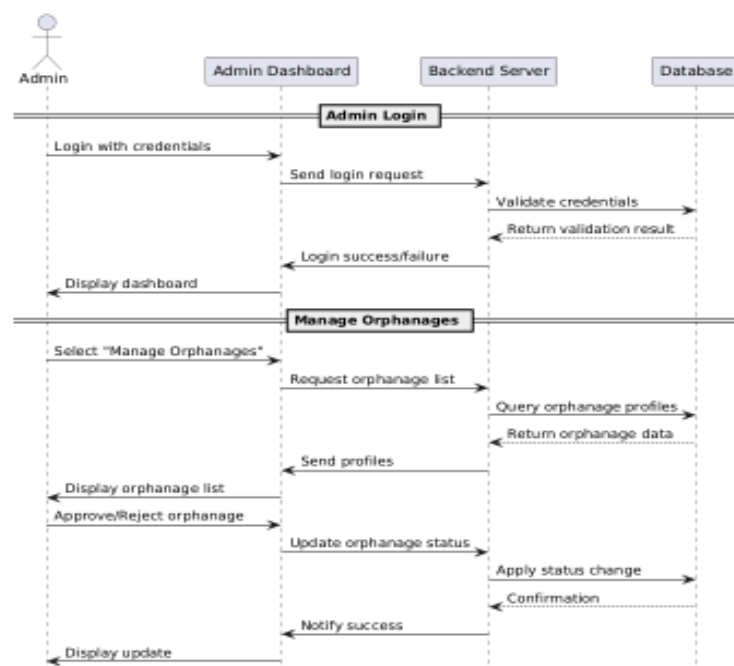


Figure 10 Admin managing orphanages.

Purpose: To illustrate how admins manage users and content.

Flow:

- Admin logs into the system.
- Views pending orphanage profiles or flagged content.
- Approves, edits, or deletes entries.
- Database is updated accordingly, and notifications are sent to users.

4.4.2.1.2 Donation Management:

Make a Donation (Goods/Funds)

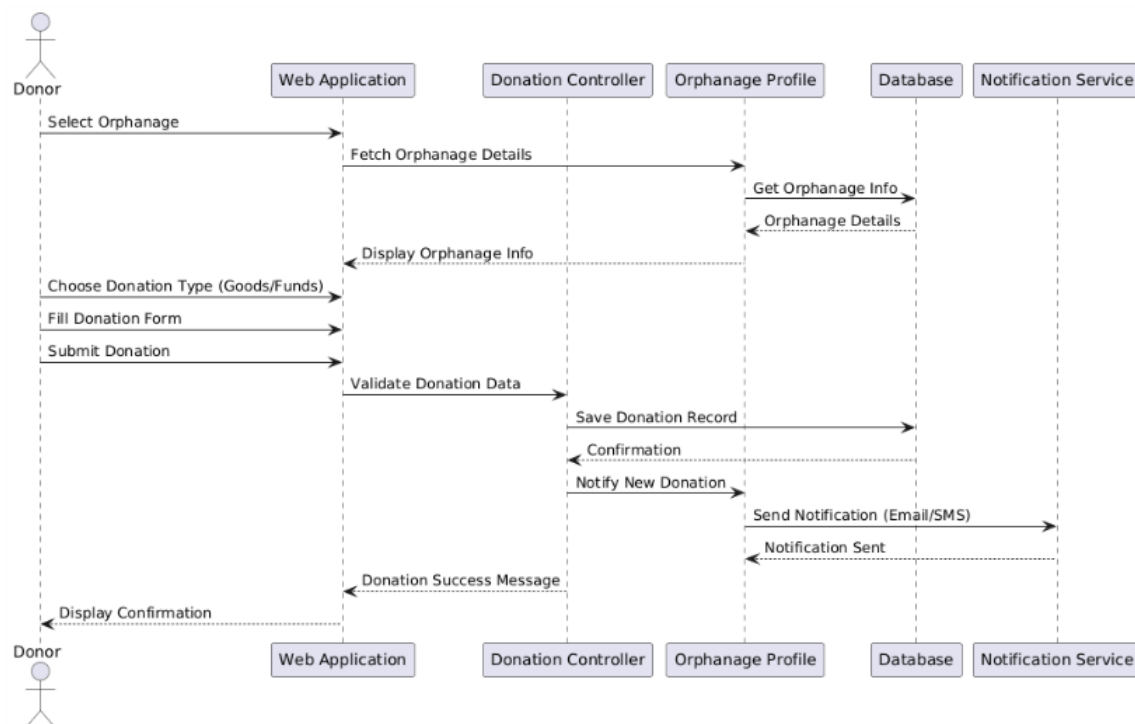


Figure 11 Donor selecting an orphanage

Purpose: To depict how a donor browses orphanages and donates.

Flow:

- Donor searches for orphanages.
- System filters and displays matching results.
- Donor selects an orphanage and initiates a donation.
- Payment is processed via the payment gateway.
- Donation is recorded, and confirmation is sent to the donor.

4.4.2.1.3 User Management:

User Registration

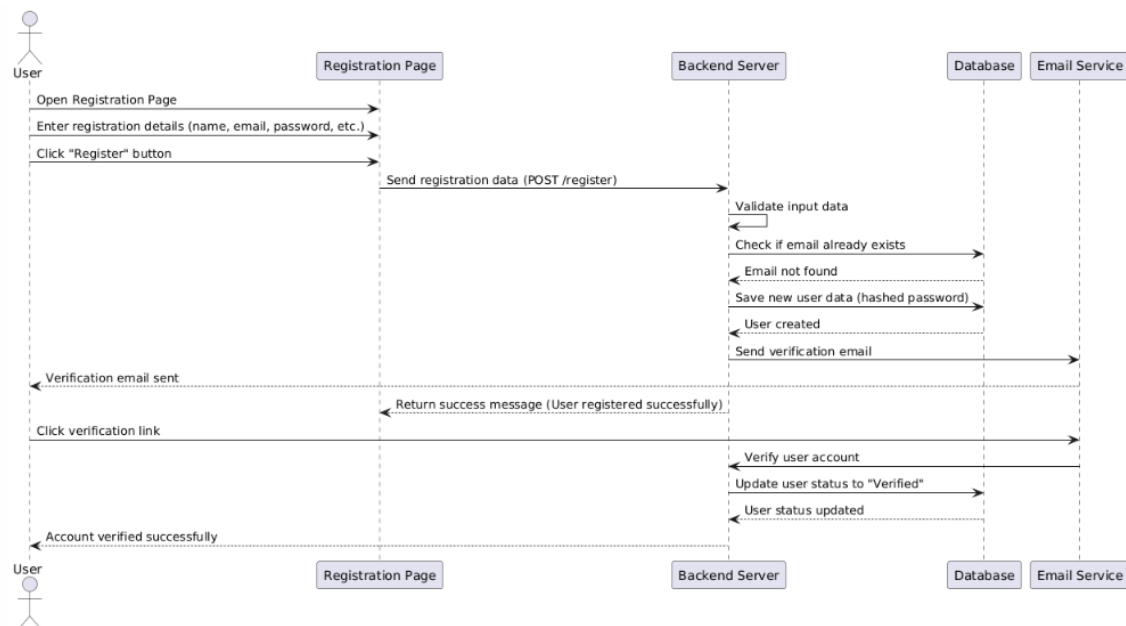


Figure 12 Steps for a new user (donor) signing up.

Purpose: To show the process of a user registering or logging into the platform.

Flow:

- User submits registration/login details.
- Frontend sends data to Backend.
- Backend validates and interacts with the Database.
- User receives confirmation or error

4.4.2.1.4 Orphanage Management:

Orphanage Registration & Profile Update

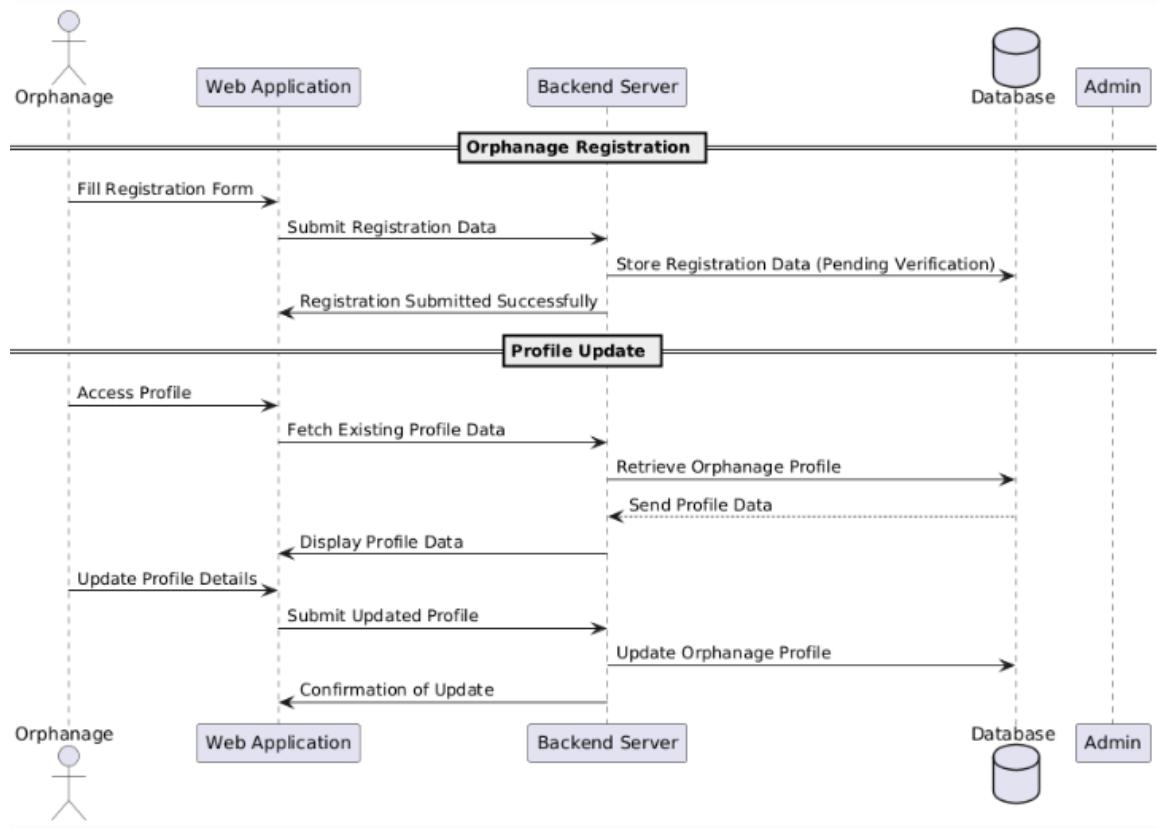


Figure 13 Steps for orphanages registering and updating their profiles.

Purpose: To illustrate how an orphanage signs up and manages its profile.

Flow:

- Orphanage registers and submits details.
- Backend validates and stores data.
- Orphanage can later update profile info and needs.
- Database reflects updated details.

4.4.3 State Transition Diagram

4.4.3.1 User authentication

Description:

The user authentication state diagram represents the process of logging into the system. It includes states such as entering credentials, verification, success, or failure due to incorrect input.

State Table:

Table 22 User authentication

State	Description	Transition Event	Next State
Idle	System is waiting for user input	User enters credentials	Processing Login
Processing Login	Credentials are validated	Credentials are correct	Login Successful
Processing Login	Credentials are invalid	Credentials are incorrect	Login Failed
Login Successful	User is authenticated	-----	User Dashboard
Login Failed	User is redirected to retry login	User retries login	Processing Login

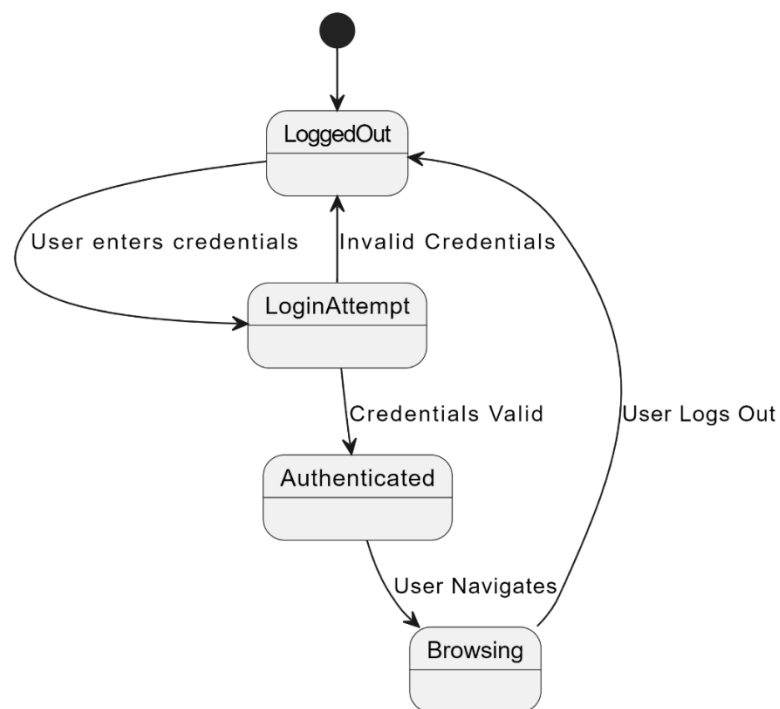


Figure 14 User authentication

4.4.3.2 Donation process

Description:

This diagram shows the different states of a donation, from initiation to completion, including payment processing and confirmation.

State Table:

Table 23 Donation process

State	Description	Transition Event	Next State
Idle	User decides to donate	User selects donation type	Selecting Donation Type
Selecting Donation Type	User chooses between monetary or item donation	User confirms selection	Filling Donation Details
Filling Donation Details	User enters details of the donation	User submits donation	Processing Donation
Processing Donation	System verifies details and payment	Payment successful	Donation Confirmed
Processing Donation	System verifies details and payment	Payment failed	Donation Failed
Donation Confirmed	Donation is completed and acknowledged		Idle

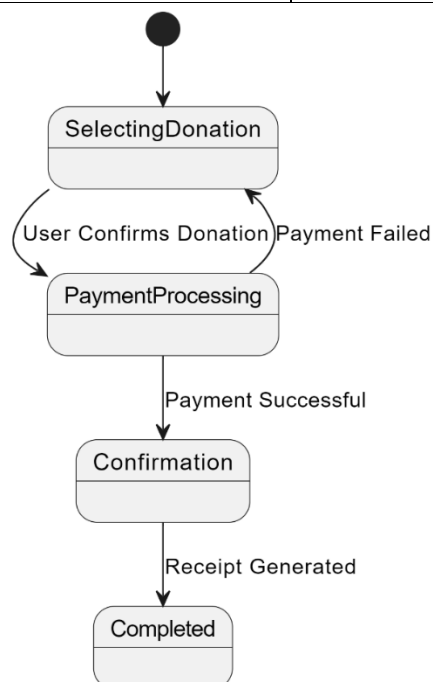


Figure 15 Donation process

4.4.3.3 Orphanage registration

Description:

This diagram represents the steps an orphanage follows to register on the platform.

State Table:

Table 24 Orphanage registration

State	Description	Transition Event	Next State
Idle	Orphanage decides to register	Orphanage clicks "Register"	Filling Registration Form
Filling Registration Form	Orphanage provides details	Orphanage submits form	Verification Pending
Verification Pending	Admin verifies details	Approved by admin	Registration Successful
Verification Pending	Admin verifies details	Rejected by admin	Registration Failed
Registration Successful	Orphanage can now update its profile and needs		Idle

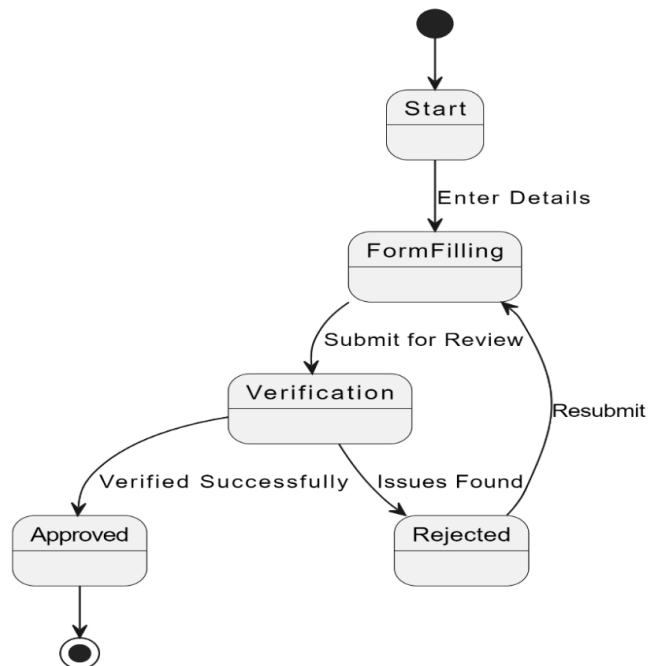


Figure 16 Orphanage registration

4.4.3.4 Donation center Inventory management

Description:

This diagram represents how a donation center manages its inventory, from item addition to updating stock levels.

State Table:

Table 25 Donation center Inventory management

State	Description	Transition Event	Next State
Idle	System waits for inventory update	Donation center adds items	Adding Items
Adding Items	System processes new inventory items	Items successfully added	Inventory Updated
Adding Items	System processes new inventory items	Item entry failed	Error
Inventory Updated	Updated inventory is available		Idle

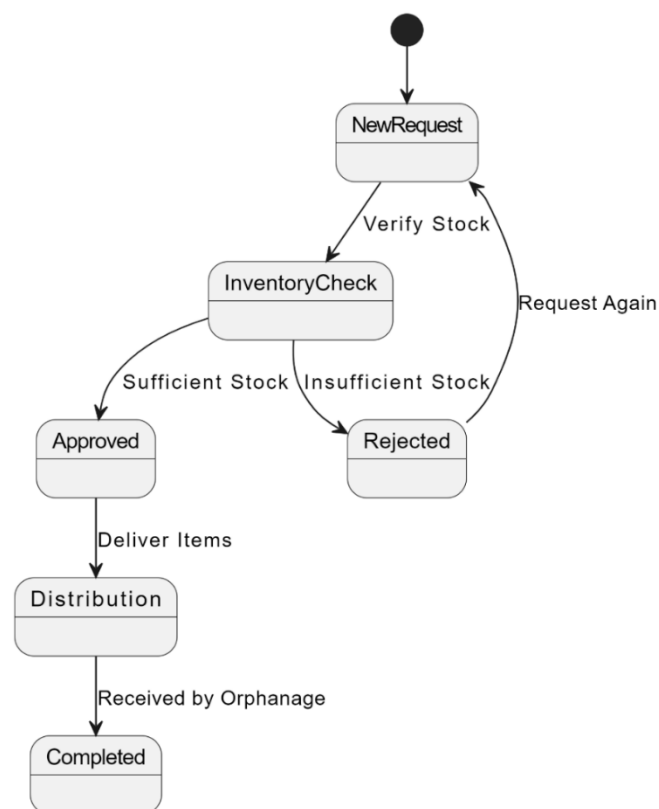


Figure 17 Donation center Inventory management

4.4.3.5 Search and filter

Description:

This diagram represents the different states involved when a user searches and filters orphanages or donation centers.

State Table:

Table 26 Search and filter

State	Description	Transition Event	Next State
Idle	System is waiting for search input	User enters query	Processing Search
Processing Search	System filters and sorts results	Results found	Displaying Results
Processing Search	System filters and sorts results	No results found	No Results Found
Displaying Results	Search results are displayed	User selects an option	Viewing Details
No Results Found	No matching data is found	User modifies search	Processing Search

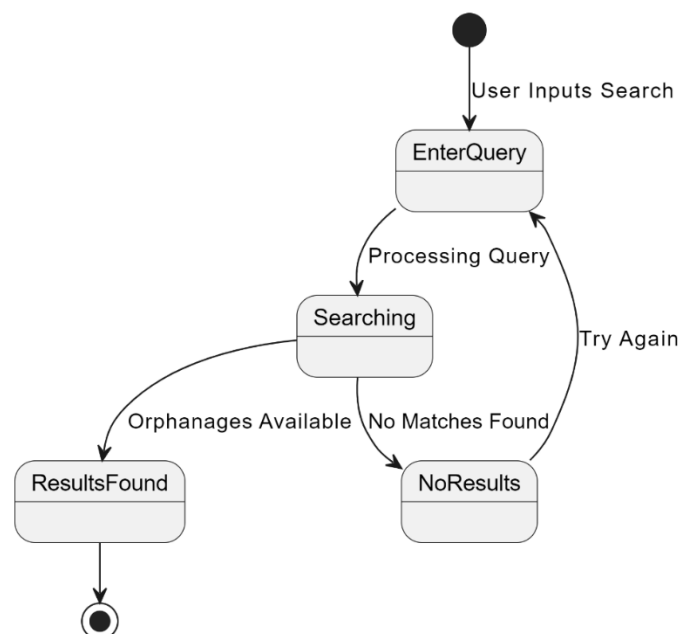


Figure 18 Search and filter

4.5 System Architecture

The system architecture for Safe Haven is designed to efficiently connect donors, orphanages, and administrators through a robust, secure, and scalable web platform. The architecture follows a threetier model consisting of the client (Frontend), Application Server (Backend), and Database, along with external service integrations like payment gateways and mapping APIs. This setup ensures smooth interactions, data flow, and scalability.

4.5.1 Components:

1. ClientSide (Frontend):

- **Technology:** React.js, HTML, CSS, JavaScript
- **Responsibilities:**
 - Provides an interactive and user-friendly interface.
 - Allows users to register, browse orphanages, make donations, and track activities.
 - Communicates with the backend via RESTful APIs.

2. Application Server (Backend):

- **Technology:** Node.js, Express.js
- **Responsibilities:**
 - Handles business logic and processes user requests.
 - Manages authentication using JWT for secure login.
 - Facilitates donation processes, orphanage management, and user interactions.
 - Integrates with payment gateways (Easypaisa and JazzCash) and Google Maps API.

3. Database:

- **Technology:** MongoDB (NoSQL)
- **Responsibilities:**
 - Stores user profiles, orphanage details, donation records, and transaction logs.
 - Manages relationships between users, donations, and orphanages.
 - Ensures data consistency and quick retrieval.

4. External Services:

- **Payment Gateways:** Easypaisa and JazzCash for secure and local online transactions.
- **Email Notifications:** Nodemailer for sending donation confirmations and updates.
- **Mapping Service:** Google Maps API to display orphanage locations and directions.

4.5.2 Interactions:

1. Frontend to Backend:

- Communication occurs over secure HTTPS using RESTful APIs.

- Example: When a user donates, the frontend sends a donation request to the backend API.
2. **Backend to Database:**
 - The backend uses Mongoose (MongoDB ORM) to perform CRUD operations.
 - Example: Storing new user registration details or donation records.
 3. **Backend to External Services:**
 - **Payment Integration:** The backend communicates with Easypaisa and JazzCash APIs to process payments and verify transactions.
 - **Email Notifications:** Nodemailer sends confirmation emails post donation.
 - **Mapping:** The backend fetches location data from Google Maps API to render orphanage locations on the frontend.

4.5.3 System Architecture Diagram

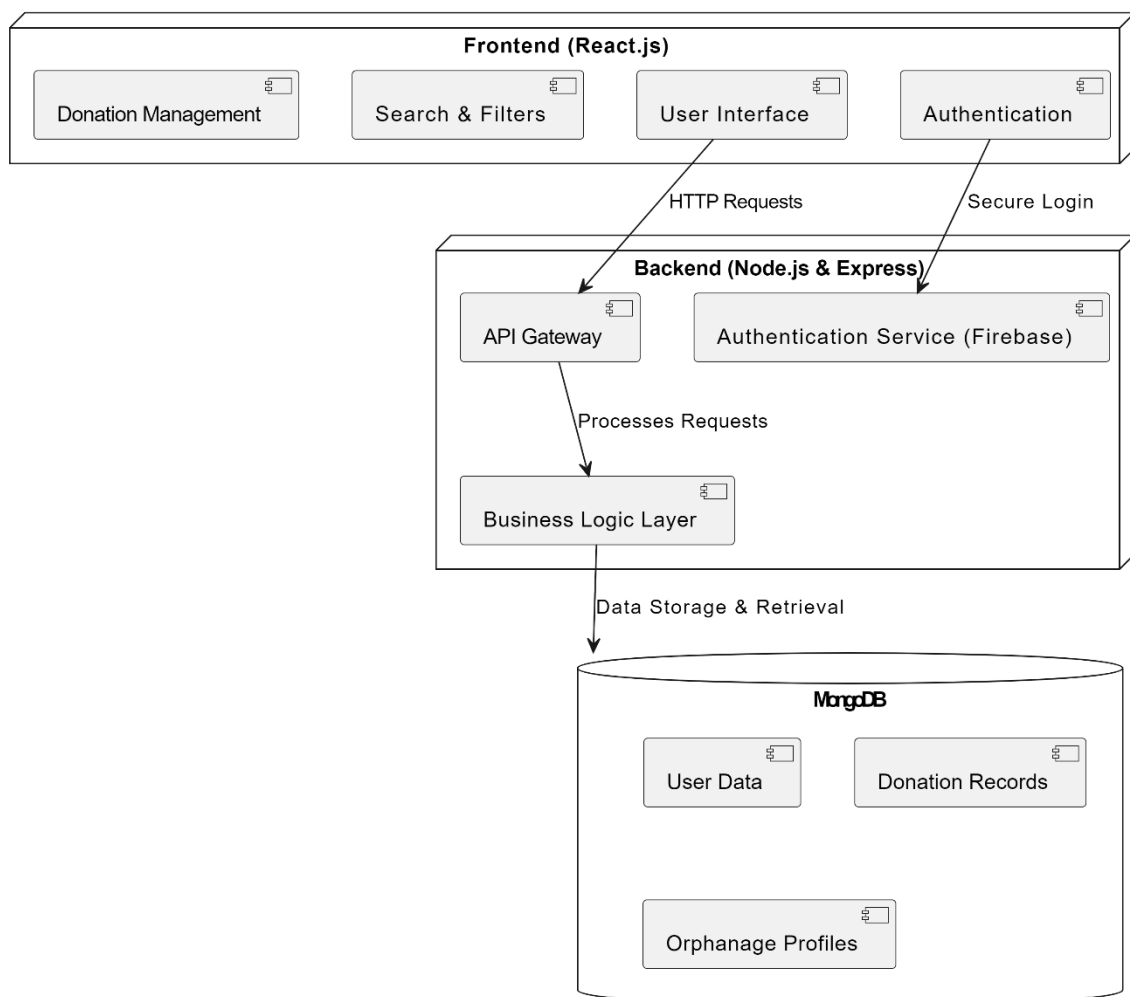


Figure 19 System Architecture Diagram

Here's how it works:

1. Frontend (React.js)

- Users interact with the User Interface (UI) to perform actions.
- Key functionalities include:
 - **Donation Management** – Allows users to make and track donations.
 - **Search & Filters** – Users can search for orphanages and filter results.
 - **User Interface** – Handles the visual presentation and user experience.
 - **Authentication** – Manages user login and registration.

2. Backend (Node.js & Express)

- The Frontend sends HTTP Requests to the backend for processing.
- **API Gateway** acts as the entry point, routing requests to appropriate services.
- **Authentication Service (Firebase)** handles user authentication and secure login.
- **Business Logic Layer** processes user requests and manages the application's logic.
- Backend interacts with the MongoDB Database to fetch and store data.

3. Database (MongoDB)

- Stores and manages application data:
 - **User Data** – Stores registered users and their details.
 - **Donation Records** – Keeps track of all donations.
 - **Orphanage Profiles** – Stores information about orphanages.

4. Data Flow

- User initiates an action in the Frontend UI.
- **HTTP Request** is sent to the API Gateway in the Backend.
- If authentication is needed, the request goes through Firebase Authentication.
- The Business Logic Layer processes the request.
- The backend interacts with MongoDB for data retrieval/storage.
- The processed data is sent back to the Frontend UI for display.

4.6 Data Design

4.6.1 Database Design

4.6.1.1 Data Requirements

The Safe Haven system comprises several key entities designed to facilitate seamless interactions between donors, orphanages, and administrators. Core entities include Users, who can register as donors, , or admins, and Orphanages, which provide information about their needs and location.

- The Donation entity tracks contributions
- Feedback allows users to review and rate orphanages, promoting transparency.
- Messages and Notifications support communication between users.

- The Location entity aids in mapping orphanages, ensuring users can find nearby centers easily.

Together, these entities create a robust system that simplifies donations, enhances user engagement, and promotes transparency.

4.6.1.2 Entity and their Attributes

1. **User** (userID, name, email, password, phone, address, role (Dono/Admin), profilePicture, createdAt)
2. **Orphanage** (orphanageID, name, location, contactPerson, phone, email, description, needs, registrationDate, image)
3. **Donation** (donationID, userID, orphanageID, donationType (Money/Items), amountOrItem, donationDate, status)
4. **Feedback/Review** (feedbackID, userID, orphanageID, rating, comment, date)
5. **Message/Notification** (messageID, senderID, receiverID, content, timestamp, status)
6. **Location** (locationID, orphanage, latitude, longitude, address, city, state, country)

4.6.1.3 Primary Keys (PK) and Foreign Keys (FK)

User	a. Primary Key: `user_id`
	b. Foreign Keys: None
Orphanage	a. Primary Key: `orphanage_id`
	b. Foreign Keys: None
Donation	a. Primary Key: `donation_id`
	b. Foreign Keys:
	i. `user_id` → References User(user_id)
	ii. `orphanage_id` → References Orphanage(orphanage_id)
Feedback/Review	a. Primary Key: `feedback_id`
	b. Foreign Keys:
	i. `user_id` → References User(user_id)
	ii. `orphanage_id` → References Orphanage(orphanage_id)
Admin	a. Primary Key: `admin_id`
	b. Foreign Keys: None
Notifications	a. Primary Key: `notification_id`
	b. Foreign Keys:
	i. `user_id` → References User(user_id)

4.6.1.4 Relationships

4.6.1.4.1 One-to-Many Relationships:

- **User → Donations:**
 - One user (donor) can make multiple donations.
- **Orphanage → Donations:**
 - One orphanage can receive multiple donations.

4.6.1.4.2 One-to-One Relationships:

- **User ↔ Profile:**
 - Each user may have an extended profile (with details like profile picture, bio, etc.).
- **Orphanage ↔ Location Details:**
 - Each orphanage may have a unique location entry with detailed address info (if handled separately).

4.6.1.5 ER Diagram

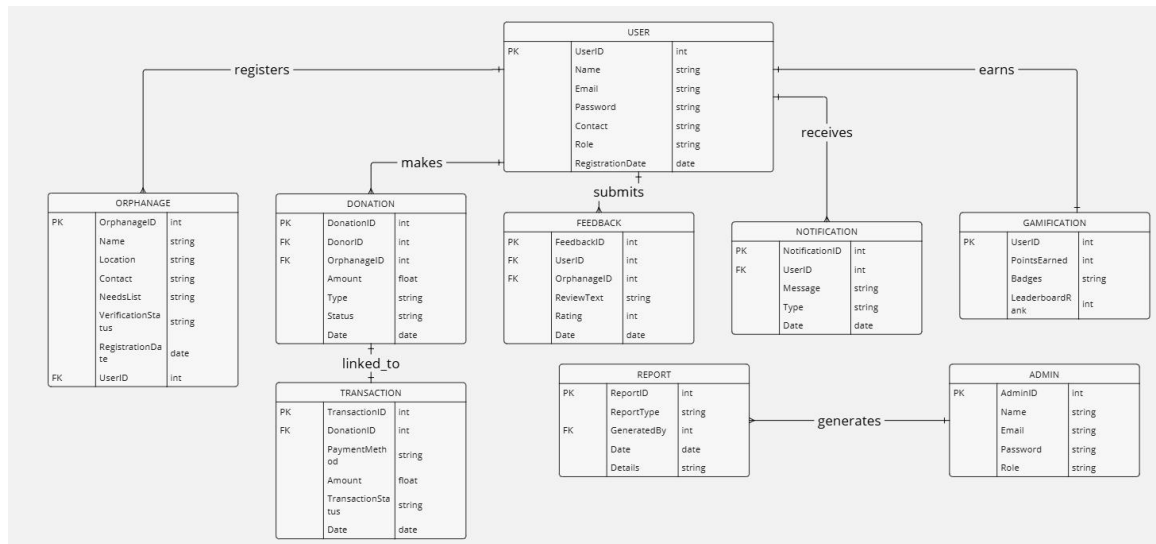


Figure 20 ER Diagram

4.6.1.6 Normalized Diagram

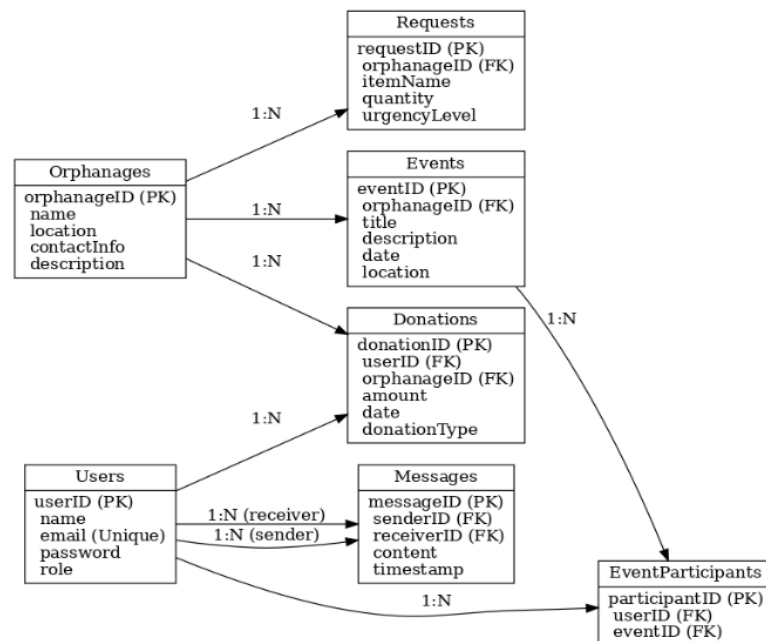


Figure 21 Normalized diagram

4.6.2 Data Flow Diagram (DFD)

The Data Flow Diagram (DFD) for Safe Haven illustrates the flow of information within the system, highlighting how data moves between users, processes, and data stores. It helps in understanding the functional aspects of the system by visualizing inputs, processes, and outputs.

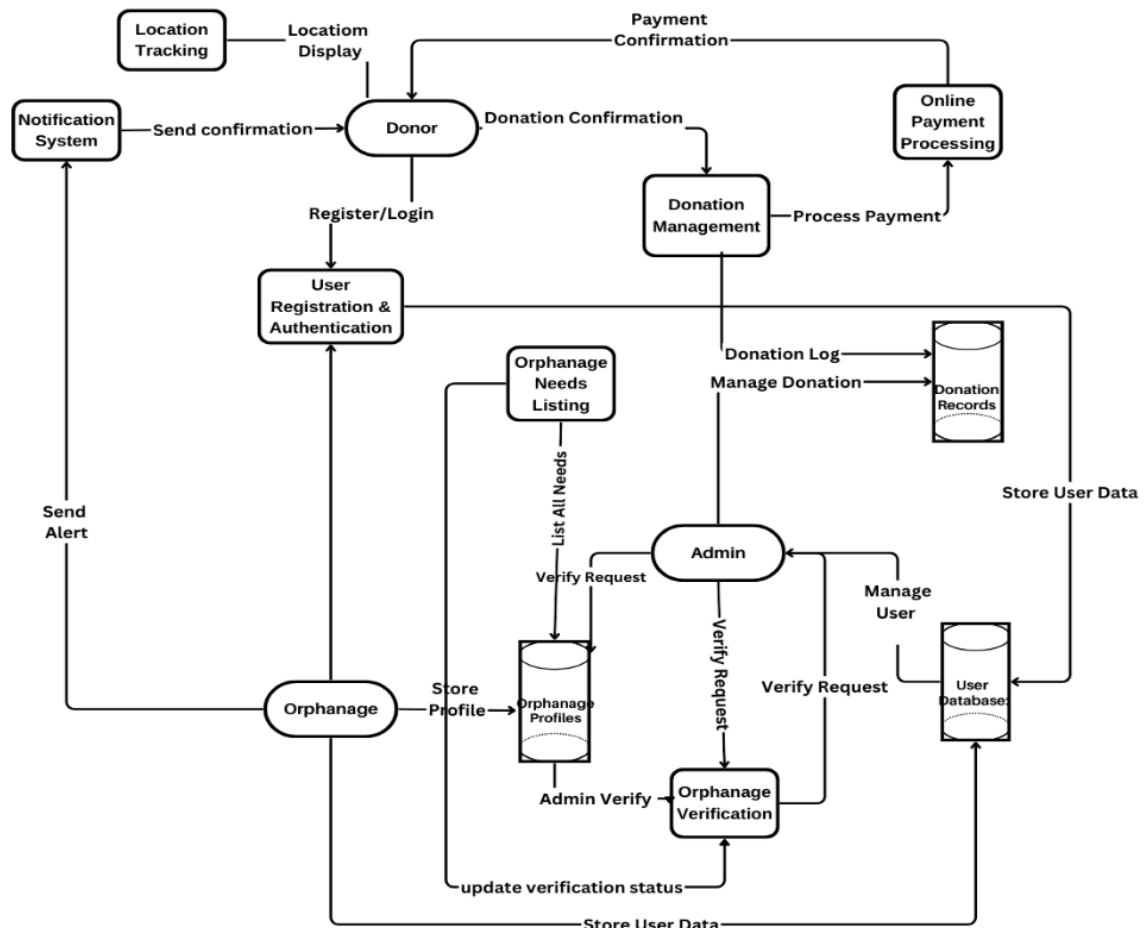


Figure 22 Data Flow Diagram

4.6.2.1 Context Level (Level 0) DFD:

At the highest level, the Safe Haven system interacts with three primary external entities: Donors, Orphanages, and Administrators. Donors interact with the system to browse orphanages, make donations (goods/funds), and receive confirmations. Orphanages register and update their profiles, while administrators oversee system operations, approve orphanage registrations, and manage reported issues. The central system acts as the mediator, handling data exchanges between these entities while ensuring data integrity and security.

4.6.2.1 Level 1 DFD:

The Level 1 DFD breaks down the system into core processes:

1. **User Management:** Handles donor and orphanage registrations, logins, and profile updates. It interacts with the user database for storing and retrieving user credentials and profiles.
2. **Orphanage Management:** Allows orphanages to register, update profiles, and list their needs. Data flows between the orphanages and the orphanage database.
3. **Donation Management:** Facilitates the donation process. Donors select orphanages, choose donation types (goods/funds), and proceed with payments. This module integrates with Easypaisa and JazzCash for payment processing.
4. **Reporting and Feedback:** Users can report issues or submit feedback, which is processed and stored in the Reports Database for administrative review.
5. **Notifications:** Sends automated emails (using Nodemailer) to donors for successful donations and updates orphanages about received contributions.

4.6.3 Data Dictionary

- **Alphabetical List of System Entities or Major Data with Types and Descriptions:**

Table 27 Alphabetical List of System Entities

Terminology	Description (Data Type, Role, or Purpose)
Admin	Entity representing system administrators who manage users, donations, and orphanages.
AdminID	Unique identifier for each admin (Integer, Primary Key).
Badges	Achievements earned by users through engagement (String, Gamification).
DonationID	Unique identifier for each donation (Integer, Primary Key).
DonationStatus	Status of a donation (Pending, Completed, Failed) (String).
DonorID	Foreign key linking a donation to the donor (Integer, FK).
Email	User's email address for login and notifications (String, Unique).
Feedback	Entity storing user reviews and ratings for orphanages.
FeedbackID	Unique identifier for each feedback entry (Integer, Primary Key).
Gamification	Entity storing user engagement rewards like points and badges.
LeaderboardRank	User's ranking based on engagement points (Integer, Gamification).
Location	Geographic information of an orphanage (String, Address).

NeedsList	List of items or services requested by an orphanage (Text).
Notification	Entity representing alerts sent to users.
NotificationID	Unique identifier for each notification (Integer, Primary Key).
OrphanageID	Unique identifier for each orphanage (Integer, Primary Key).
Password	Encrypted user password for authentication (String).
PaymentMethod	The method used for donation payments (Card, JazzCash etc.) (String).
PointsEarned	Points collected by users for donations and interactions (Integer, Gamification).
RegistrationDate	Timestamp when a user or orphanage was registered (DateTime).
Report	Entity storing system-generated reports.
ReportID	Unique identifier for each report (Integer, Primary Key).
ReportType	Specifies the type of report (Donations, Orphanages, etc.) (String).
ReviewText	User submitted feedback text for an orphanage (String).
Transaction	Entity representing financial transactions related to donations.
TransactionID	Unique identifier for each transaction (Integer, Primary Key).
TransactionStatus	Status of a payment transaction (Success, Pending, Failed) (String).
UserID	Unique identifier for each user (Integer, Primary Key).
VerificationStatus	Status indicating whether an orphanage is verified (Boolean).

- **Structured Approach: Functions and Function Parameters:**

Table 28 Structured Approach: Functions and Function Parameters

Function Name	Parameters	Data Type	Description
registerUser	name, email, password	String, String, String	Registers a new user (donor, orphanage admin).
loginUser	email, password	String, String	Authenticates user login.
searchOrphanage	location, category	String, String	Searches orphanages based on filters like location or type of needs.

makeDonation	donorID, orphanageID, amount, type	String, String, Float, String	Processes a donation (monetary or item based).
trackDonation	donationID	String	Tracks the status of a donation.
submitFeedback	userID, orphanageID, review, rating	String, String, String, Int	Submits feedback about an orphanage, including ratings.
sendNotification	userID, message	String, String	Sends notifications to users for updates.
processPayment	donationID, paymentMethod, amount	String, String, Float	Processes a donation payment securely.
updateProfile	userID, name, email, contact	String, String,	Updates user profile details.

- **ObjectOriented (OO) Approach: Objects, Attributes, Methods, & Method Parameters:**

Table 29 ObjectOriented (OO) Approach

Object	Attribute	Methods	Method parameters
Orphanage	orphanageID, name, location, needs	requestDonations()	orphanageID,
Donation	donationID, donorID, orphanageID, amount	makeDonation(), track donation()	donorID, orphanageID, amount
Review	reviewID, userID, orphanageID, content	submitFeedback	userID, orphanageID, review
Notification	notificationID, userID, message	sendNotification()	userID, message

4.7 User Interface Design

The user interface design of Safe Haven is a visual blueprint that outlines the structure and layout of the platform's key pages, focusing on user experience (UX) and functionality without incorporating design elements like colors or images. It helps map out how users will navigate the site and interact with its features.

4.7.1 Components

1 Home Page:

- **Header:** Logo, Navigation Bar (Home, Orphanages, Donate, About Us, Contact)
- **Hero Section:** Banner with mission statement and a collocation (e.g., "Find Orphanages" or "Donate Now")
- **Features Overview:** Brief on key platform features (donation tracking, orphanage locator)
- **Footer:** Social media links, contact info, terms, and privacy policy

2 Profile Page:

- **Orphanage Details:** Name, location, verified badge, and description
- **Needs List:** Items or services required (with donation buttons)
- **Media Section:** Images and videos showcasing the orphanage
- **Reviews & Ratings:** User generated reviews and star ratings

3 Donation Page:

- **Donation Options:** Onetime, recurring, or targeted donations (e.g., education, food)
- **Secure Payment Gateway:** Form for payment details with encryption indicators
- **Donation Tracking:** Progress bar showing fundraising goals and impact

4 About Us:

- **Hero Section:** A powerful image/video with a mission driven tagline and a "Donate Now" button.
- **Testimonials:** Real stories from donors and orphanages in a carousel or grid format.
- **CalltoAction & Footer:** Encouraging visitors to donate, along with quick links and social media icons.

5 Subscription Page

- **Header:** Logo, Navigation Menu (Home | About | Orphanages | Donate | Contact), Login/Sign Up Button
- **Subscription Plan Selection:** Title, Short description

6 FAQ Page

- **Header:** Contains the website's logo, navigation bar, and a search bar for quick FAQ lookups.
- **FAQ Categories:** Sections such as General Information, Donations, Orphanage Registration, Security & Privacy, and Technical Support.
- **Expandable Questions:** Each question can be clicked to reveal a concise answer, ensuring a clutter free interface.
- **Contact Support Section:** If users cannot find their answers, they can access customer support via live chat, email, or a contact form.

4.7.2 Wireframe Of Each Component

home Page:



- Header: Logo, Navigation Bar (Home, Orphanages, Donate, About Us, Contact)
- Hero Section: Banner with mission statement and a call to action (e.g., "Find Orphanages" or "Donate Now")
- Features Overview: Brief on key platform features (donation tracking, orphanage locator)
- Footer: Social media links, contact info, terms, and privacy policy

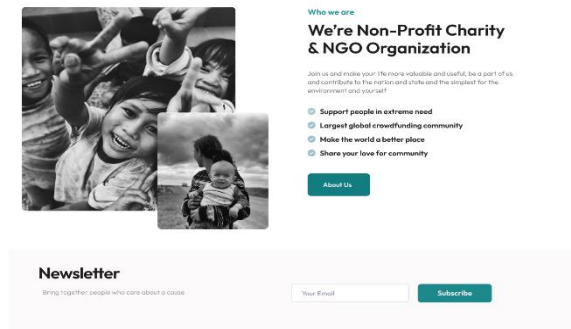
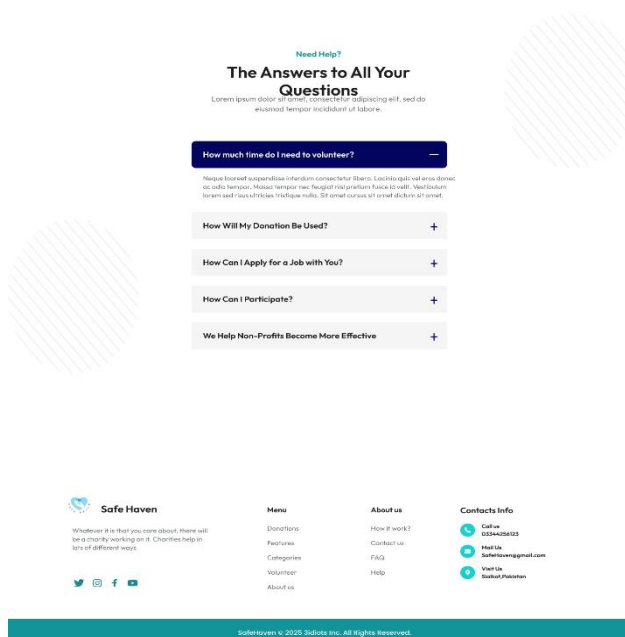


Figure 23 home page



Profile Page:

Pakistan Donation Foundation

Welcome!

Organizational head: Ahmed Raza

Focus Area: Food distribution, education support, medical aid, and disaster relief

Online Presence: www.pkdonationcenter.org

License and Registration: Registered under the Social Welfare Department, Punjab (Reg. No: PK-12345)

Year Established: 2015

Address: 123 Main Street, abc Town, Sialkot, Punjab, Pakistan

Needs: Clothes, non-perishable food, books, toys, and medical supplies.

Contact Information:

- Phone: +92 312 4567890
- Email: info@pkdonationcenter.org

Operating Hours:

- Monday – Saturday: 9:00 AM – 6:00 PM
- Sunday: Closed

Social Media Links:

Facebook: facebook.com/PKDonationCenter
 Instagram: instagram.com/PKDonationCenter
 Twitter: twitter.com/PKDonationPK

[Donate now](#)

+92 312 4567890

info@pkdonationcenter.org

[Donate now](#)

Safe Haven

Whatever it is that you care about, there will be a charity working on it. Charities help in lots of different ways

Menu

- Donations
- Features
- Categories
- Volunteer
- About us

About us

- How it work?
- Contact us
- FAQ
- Help

Contacts Info

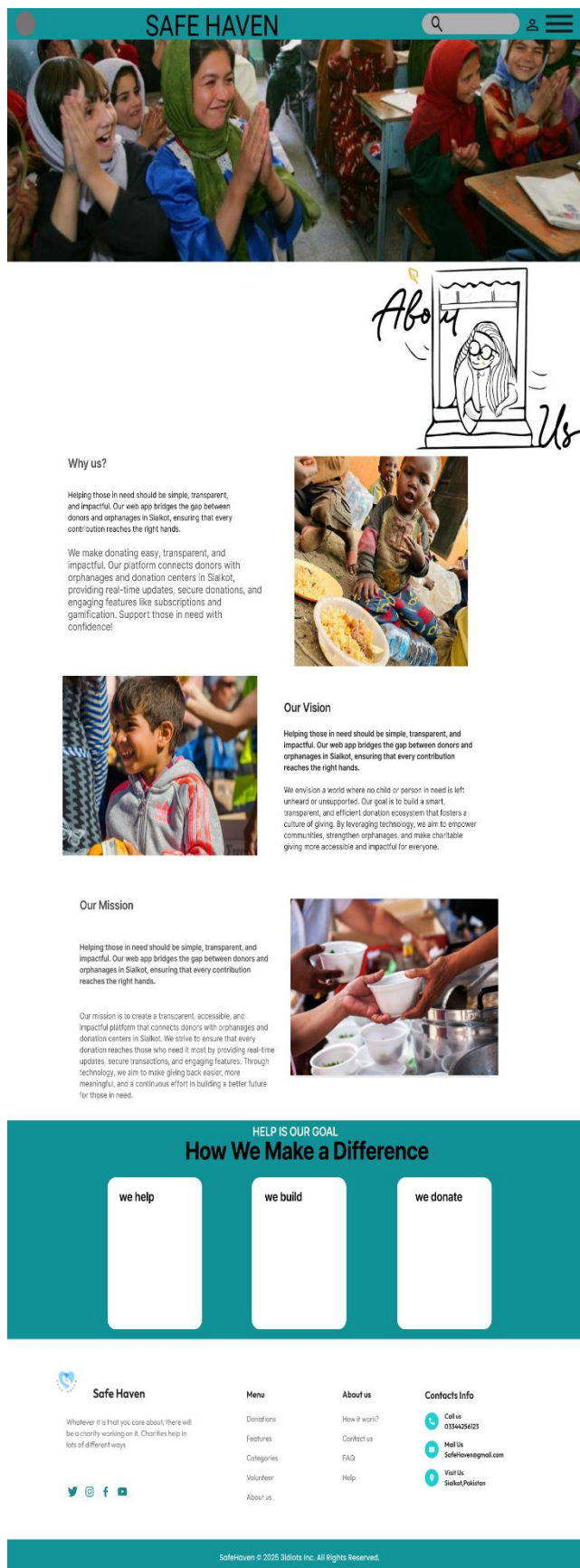
- Call us
 03344256123
- Mail Us
Safehaven@gmail.com
- Visit Us
 Sialkot, Pakistan

SafeHaven © 2025 3idots Inc. All Rights Reserved.

- Orphanage Details: Name, location, verified badge, and description
- Needs List: Items or services required (with donation buttons)
- Media Section: Images and videos showcasing the orphanage
- Reviews & Ratings: User generated reviews and star ratings

Figure 24 Profile Page:

About Us



- **Hero Section:** A powerful image/video with a mission driven tagline and a "Donate Now" button.
- **Testimonials:** Real stories from donors and orphanages in a carousel or grid format.
- **Call-to-Action & Footer:** Encouraging visitors to donate, along with quick links and social media icons.

Figure 25 About Us

Subscription Page



Subscribe to Stay Updated & Make a Difference!

Join our mission to support those in need by subscribing to our donation center updates! By signing up, you'll receive regular updates on urgent donation requirements, upcoming charity events, volunteer opportunities, and inspiring success stories of lives changed through your generosity. As a subscriber, you'll be the first to know about special fundraising campaigns, emergency relief efforts, and seasonal donation drives, ensuring that your contributions reach the right people at the right time. Together, we can create a stronger, more compassionate community. Sign up today and be a part of the movement that brings hope, support, and positive change to those who need it most!

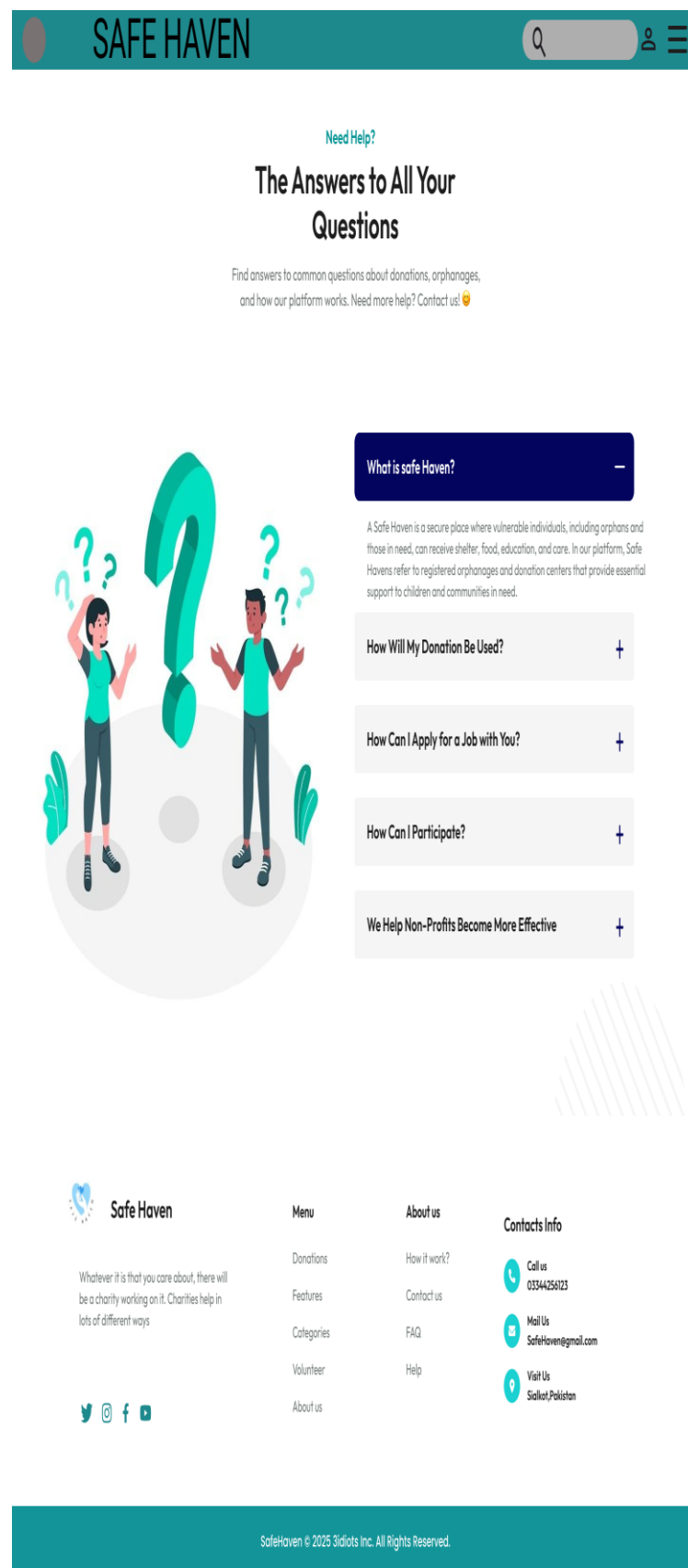
Header: Logo, Navigation Menu (Home | About | Orphanages | Donate | Contact), Login/Sign Up Button

Subscription Plan Selection: Title, Short description

Figure 26 Subscription Page



FAQ Page



Header: Contains the website's logo, navigation bar, and a search bar for quick FAQ lookups.

FAQ Categories: Sections such as General Information, Donations, Orphanage Registration, Security & Privacy, and Technical Support.

Expandable Questions: Each question can be clicked to reveal a concise answer, ensuring a clutter free interface.

Contact Support Section: If users cannot find their answers, they can access customer support via live chat, email, or a contact form.

Figure 27 FAQ Page

Donation Page:



SAFE HAVEN

Donation Form

username phone number

email id amount

where to donate
 donation centers ☐ bank ☐ easypaisa ☒ jazzcash
 Orphanages

Any message

Acc details

Donation Options:
Onetime, recurring, or targeted donations (e.g., education, food)

Secure Payment Gateway:
Form for payment details with encryption indicators

Donation Tracking:
Progress bar showing fundraising goals and impact

Figure 28 Donation Page:

4.7.3 Screen Objects and Actions

Use Case 1: User Registration & Login

Screen: Registration & Login Page

Table 30 Screen: Registration & Login Page

Screen Object	Description	Actions
Input Fields (Name, Email, Password, Confirm Password)	Text boxes allow users to enter registration details.	User types required details. The system validates inputs.
Radio Button (User Type Selection)	Allows users to select their role (Donor or Orphanage Admin).	The user selects a role. UI updates based on selection.
Submit Button ("Register")	Triggers the registration process.	The system verifies input data. If successful, the account is created, and a confirmation message is displayed.
Login Fields (Email, Password)	Text boxes for logging into an existing account.	The user enters login credentials. The system authenticates the user and redirects to the dashboard.
Login Button	Triggers the authentication process.	Validates credentials. Redirects to appropriate dashboard based on user type.
Forgot Password Link	Allows users to recover their password.	The user clicks a link. The system sends password reset instructions via email.

Use Case 2: Making a Donation

Screen: Donation Page

Table 31 Screen: Donation Page

Screen Object	Description	Actions
Dropdown Menu (Select Orphanage)	Lists available in orphanages.	The user selects an orphanage from the list.
Radio Button (Donation Type)	Allows users to choose between "Monetary" or "Item Based" donations.	The user selects donation type, triggering different UI options.
Input Field (Amount)	Displays input field when "Monetary" donation is selected.	User enters amount to donate. System validates the input.
File Upload (Upload Item Image)	Allows users to upload an image of the item they want to donate.	User selects and uploads an image.
Textarea (Item Description)	Allows users to describe the item being donated.	User enters item details.
Payment Method Dropdown	Lists available payment options for monetary donations.	User selects a preferred payment method.
Donate Button	Confirms and processes the donation.	System processes the donation. Sends confirmation email and updates donation history.
Cancel Button	Allows users to cancel the donation process.	Clears all inputs and returns to the previous screen.

4.8 Design Decisions

1. **Architecture:** Used MVC Pattern for separation of concerns, scalability, and maintainability.
2. **Design Patterns:** Applied Factory, Singleton, Observer, and Strategy patterns for efficient code management.
3. **Database Normalization:** Followed 3NF to reduce redundancy and improve query performance.
4. **Algorithms:** Implemented Full Text Search for orphanage filtering and a Rule Based Matching Algorithm for donation recommendations.

5. **Security:** Used AES256 encryption and bcrypt hashing for secure authentication and payments.
6. **Frontend & Backend:** Chose React.js for a dynamic UI and Node.js with Express.js for scalable backend operations.
7. **Payment Integration:** Integrated JazzCash API for secure and flexible donation processing.
8. **Notifications:** Used Firebase Cloud Messaging (FCM) for realtime updates.
9. **Reports & Analytics:** Integrated Power BI/Google Data Studio for donation insights.

4.9 Summary

This chapter outlined the key design elements of the Safe Haven system, including class diagrams, state diagrams, and structured functions, ensuring a well architected solution. The design phase involved critical decisions, such as adopting an object-oriented approach to ensure modularity and scalability. Various design patterns, including MVC (ModelViewController), were implemented for separation of concerns, improving maintainability.

Key system components, such as user authentication, orphanage management, donation processing, and reporting modules, were refined to align with project objectives. **Normalization** techniques were applied to the database to enhance efficiency, and security measures were incorporated to protect sensitive user and transaction data.

By focusing on structured and scalable design principles, this chapter ensures that *Safe Haven* meets its functional and nonfunctional requirements, providing an efficient, secure, and user-friendly platform for donors and orphanages.

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