Figure 1.

Bahir Dar University

Bahir Dar Institute of Technology

Faculty of Computing

Information Technology (I.T) project on ETAid Online Aiding platform

Submitted to the faculty of computing in partial fulfillment of the requirements for the degree Bachelor of Science in Information Technology.

Group members

Name	ID Number
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Advisor : Belete . M

2016

Bahir Dar University, Bahir Dar Institute of Technology

Declaration

The Project is our own and has not been presented for a degree in any other university and all the sources of material used for the project have been duly acknowledged.

Name	Signature
1. Natenael Haylemariam	
2. Yabsira Melaku	
3. Yegrem Adugna	

Faculty: Computing

Program: Information Technology (I.T)

Project Title: ETAid Online Aiding Platform

This is to certify that I have read this project and that in my supervision and the students' performance, it is fully adequate, in scope and quality, as a project for the degree of Bachelor of Science.

M.r Belete Mersha

—---------- —----------

Name of Advisor Signature

Examining committee members	Signature	Date
1. Examiner 1		
2. Examiner 2		

It is approved that this project has been written in compliance with the formatting rules laid down by the faculty.

Roles and Responsibilities of the Group Members

Develop a digital platform named ETAid to facilitate online aid services for Ethiopians, focusing on bilingual support in Amharic and English. The platform aims to streamline access to essential services and information for Ethiopian communities, ensuring inclusivity and efficiency.

List of Tasks	List members		
	Natenael Haylemariam	Yegrem Adugna	Yabsera Melaku
Front-end Developer	●	●	
Backend Developer	●	●	
Documentation Handler			●
Designer			●

Table 1.

Acknowledgment

We would like to take this opportunity to express our sincere gratitude to all those who have contributed to the ongoing development of our final year project, "ETAid: Digitalizing the Online Aiding Platform for Ethiopians."

First and foremost, we extend our heartfelt appreciation to our project advisor, **Belete M.**, for their continuous support, guidance, and encouragement throughout the developmental phase of this project. Their expertise and insightful feedback have been invaluable in navigating the challenges and complexities inherent in such a venture.

We also wish to acknowledge the faculty members of **Bahirdar University / Information Technology** for their ongoing support and academic mentorship. Their expertise and encouragement have provided us with a solid foundation upon which to build and refine our project.

Our sincere thanks go to the members of our project team for their dedication, collaboration, and collective effort in pushing the boundaries of innovation and excellence. Each team member's unique contributions and expertise have been crucial in driving the project forward and overcoming obstacles along the way.

We also wish to express our appreciation to the individuals and organizations who have generously shared their insights, feedback, and expertise, thus enriching the development process of the ETAid platform. Your contributions have been invaluable in shaping the platform's features, functionalities, and user experience.

Furthermore, we extend our thanks to our friends and family members for their unwavering support, understanding, and encouragement throughout this ongoing journey. Their belief in our vision and commitment to our success have been a constant source of motivation and inspiration.

In conclusion, we express our gratitude to all those who have contributed, directly or indirectly, to the ongoing development of the ETAid project. Your support, collaboration, and commitment to our shared vision are deeply appreciated, and we look forward to realizing the full potential of the ETAid platform together.

Thank you.

ETAid Team.

List of acronyms

Those are the lists of acronyms which are mentioned multiple times in the document.

- ETAid: Ethiopian Aiding Platform
- IT : Information Technology
- BDU: Bahirdar university
- API: Application Programming Inter

List of Figures And Tables

Those also are the lists of the figures and tables that we use for the description purpose of the ongoing development phases of our final year project

Table of Content

Abstract

ETAid: Empowering Ethiopian Communities Through an Online Aiding Platform

In Ethiopia, access to essential aid services and resources remains a challenge for many individuals and communities. Factors such as geographical barriers, limited infrastructure, and linguistic diversity further exacerbate the difficulties in accessing critical assistance. To address these challenges, we present ETAid, an innovative online aiding platform designed to bridge the gap between aid providers and Ethiopian communities.

ETAid aims to revolutionize the delivery of aid services by leveraging digital technologies to create a comprehensive and accessible platform. With a focus on bilingual support in Amharic and English, ETAid strives to ensure inclusivity and accessibility for all users, regardless of their language or technological proficiency. Through ETAid, users can easily navigate a user-friendly interface to access a wide range of aid services, including healthcare, education, employment, and emergency assistance.

Key features of ETAid include a centralized database of aid resources, real-time communication channels for users to seek assistance and engage with aid providers, and personalized user profiles to streamline the aid-seeking process. By harnessing the power of technology, ETAid empowers Ethiopian individuals and communities to overcome barriers to access and achieve greater self-sufficiency and resilience.

The development of ETAid represents a collaborative effort between multidisciplinary teams, including developers, researchers, and community stakeholders. Through ongoing consultation and feedback, ETAid has been tailored to meet the unique needs and preferences of Ethiopian communities, ensuring its relevance and effectiveness.

In conclusion, ETAid represents a groundbreaking initiative to harness the potential of digital innovation in addressing the pressing needs of Ethiopian communities. By providing a centralized platform for aid services and resources, ETAid aims to foster empowerment, resilience, and inclusivity, ultimately contributing to the well-being and prosperity of Ethiopian society as a whole.

Chapter One: Introduction

1.1 Background

The landscape of aid delivery in Ethiopia is characterized by numerous challenges, including geographical barriers, limited infrastructure, and linguistic diversity. Despite concerted efforts by governments, non-profit organizations, and community initiatives, access to essential aid services and resources remains elusive for many Ethiopian individuals and communities.

Ethiopia's diverse ethnic and linguistic composition presents a unique challenge in the provision of aid services, with Amharic and English serving as the primary languages of communication. However, existing aid platforms often fail to adequately address the linguistic needs of Ethiopian communities, leading to barriers in access and utilization.

Mission:

- To empower Ethiopian communities by providing equitable access to essential aid services and resources through innovative digital solutions.

Vision:

- To create a more inclusive and resilient society in Ethiopia, where all individuals have the opportunity to thrive and fulfill their potential, regardless of socioeconomic status or geographical location.

Core Values:

1. Inclusivity: We believe in creating a platform that is accessible and welcoming to all Ethiopian individuals and communities, irrespective of linguistic, cultural, or socioeconomic differences.
2. Empowerment: We are committed to empowering Ethiopian communities to take control of their own development by providing them with the tools, resources, and support they need to achieve self-sufficiency and resilience.
3. Collaboration: We recognize the importance of collaboration and partnership in achieving our mission. We strive to work closely with aid providers, community organizations, and other stakeholders to maximize our impact and reach.
4. Innovation: We embrace innovation as a driving force for positive change. We are continuously exploring new technologies and approaches to enhance the effectiveness and efficiency of aid delivery in Ethiopia.
5. Integrity: We uphold the highest standards of integrity, transparency, and ethical conduct in all aspects of our work. We are committed to building trust and credibility with our stakeholders through honesty, accountability, and respect.
6. Sustainability: We are dedicated to building sustainable solutions that have a lasting impact on the communities we serve. We prioritize long-term sustainability and resilience in our planning and implementation processes.

1.2 Statement of the problem

Despite efforts to improve access to aid services in Ethiopia, significant challenges persist, hindering the effective delivery of assistance to those in need. The current aid landscape in Ethiopia is characterized by:

1. **Limited Accessibility**: Many Ethiopian individuals and communities, particularly those in remote or underserved areas, face significant barriers in accessing essential aid services and resources due to geographical constraints, inadequate infrastructure, and limited transportation options.
2. **Linguistic Barriers**: The linguistic diversity of Ethiopia presents a challenge in the provision of aid services, with Amharic and English serving as the primary languages of communication. However, existing aid platforms often fail to adequately address the linguistic needs of Ethiopian communities, leading to communication barriers and disparities in access.
3. **Fragmented Service Delivery**: The decentralized nature of aid provision in Ethiopia results in fragmented service delivery, with multiple organizations and initiatives operating independently. This lack of coordination and collaboration among aid providers leads to inefficiencies, redundancies, and gaps in service coverage, ultimately impeding the effective utilization of resources.
4. **Inequitable Distribution**: Aid services and resources are not always distributed equitably across different regions and populations in Ethiopia, leading to disparities in access and outcomes. Certain marginalized groups, such as women, children, the elderly, and people with disabilities, often face greater challenges in accessing essential aid services and support.
5. **Limited Information and Awareness**: Many Ethiopian individuals and communities lack access to accurate and up-to-date information about available aid services, resources, and eligibility criteria. This limited awareness hinders their ability to seek assistance effectively and access the support they need to improve their livelihoods and well-being.

In light of these challenges, there is a critical need for innovative solutions that address the underlying barriers to access and improve the effectiveness, efficiency, and inclusivity of aid delivery in Ethiopia. The development of a digital platform like ETAid presents an opportunity to overcome these challenges and create positive change by leveraging technology to connect aid providers with Ethiopian communities in need.

1.3 Objectives

Develop a bilingual digital platform, ETAid, to provide equitable access to essential aid services and resources for Ethiopian communities, fostering inclusivity and efficiency in aid delivery. Through centralized information, real-time communication channels, and user empowerment, ETAid aims to overcome barriers to access, promote awareness, and facilitate collaboration among stakeholders to improve the well-being and resilience of Ethiopian individuals and communities.

1.3.1 GeneralObjective

The general objective of the ETAid project is to create a digital platform that revolutionizes aid delivery in Ethiopia by providing equitable access to essential services and resources for Ethiopian communities. Through innovative technology and inclusive design, ETAid seeks to empower individuals, enhance coordination among aid providers, and foster community resilience, ultimately contributing to the overall well-being and development of Ethiopian society.

1.3.1 Specific Objective

1. **Enhanced Access:** Develop a user-friendly digital platform accessible via web, ensuring individuals across Ethiopia can easily access essential aid services and resources.
2. **Centralized Information Hub:** Establish a comprehensive database within the ETAid platform that aggregates information on available aid services, resources, and providers, facilitating efficient navigation and access to critical assistance.
3. **User Empowerment:** Provide personalized user profiles and educational resources on the ETAid platform to empower individuals with information about their rights, available services, and how to navigate the aid system effectively.
4. **Awareness and Education:** Develop outreach initiatives and educational materials within ETAid to raise awareness among Ethiopian communities about available aid services, eligibility criteria, and rights, empowering them to advocate for themselves and access appropriate support.
5. **Continuous Improvement:** Establish feedback mechanisms and performance metrics within ETAid to monitor user satisfaction, service delivery efficiency, and platform effectiveness, enabling iterative improvements to meet the evolving needs and preferences of Ethiopian communities.

1.4 Methodology

1.4.1 Requirement gathering methods

The requirement gathering methodology for the ETAid project involves a systematic approach to identifying, analyzing, and documenting the needs and preferences of stakeholders. This process includes the following steps:

1. **Information Collection:** Conduct interviews, surveys, focus groups, and workshops to gather information about the challenges, preferences, and requirements of users related to aid services and resources.
2. **Data Analysis:** Analyze the collected data to identify common themes, patterns, and priorities among stakeholders, allowing for a deeper understanding of their needs and preferences.
3. **Requirement Prioritization:** Prioritize the identified requirements based on their importance, feasibility, and potential impact on the success of the ETAid platform.
4. **Documentation:** Document the gathered requirements in a clear and concise manner, ensuring that all relevant information is captured accurately and comprehensively.

5. **Validation:** Validate the gathered requirements with users to ensure that they accurately reflect their needs and preferences, incorporating feedback and making adjustments as necessary.
6. **Continuous Iteration:** Continuously iterate and refine the requirement gathering process based on ongoing feedback and changes in users needs, ensuring that the ETAid platform remains responsive and relevant throughout its development lifecycle.

1.4.2 Analysis and design Methodology

The analysis and design methodology for the ETAid project involves a structured approach to understanding user needs, defining system requirements, and designing the architecture and user interface of the platform. This process includes the following steps:

1. **User Needs Assessment:** Conduct a thorough assessment of user needs and preferences through users interviews, surveys, and usability studies to identify key requirements and features for the ETAid platform.
2. **Requirement Analysis:** Analyze the gathered requirements to identify functional and non-functional requirements, ensuring that all users' needs are accurately captured and prioritized.
3. **Database Design:** Design the database schema and data model for the ETAid platform, ensuring efficient storage, retrieval, and management of data related to aid services, resources, users, and interactions.
4. **Technical Feasibility Assessment:** Assess the technical feasibility of implementing the designed system architecture and features, considering factors such as technology stack, development tools, and infrastructure requirements.
5. **Risk Analysis:** Identify potential risks and challenges associated with the design and implementation of the ETAid platform, and develop mitigation strategies to address them proactively.
6. **Iterative Design:** Adopt an iterative approach to design, incorporating feedback from users and conducting usability testing at various stages of the design process to refine and improve the ETAid platform continuously.
7. **Documentation:** Document the analysis and design decisions, including requirements specifications, database schemas, and user interface mockups, to provide a comprehensive reference for the development team.

1.4.3 Implementation Methodology

The implementation methodology for the ETAid project involves a systematic approach to developing and testing the digital platform. This process includes the following steps:

1. **Development Environment Setup:** Set up the development environment, including necessary software tools, frameworks, and version control systems, to support the development of the ETAid platform.

2. **Agile Development:** Adopt an agile development methodology, to facilitate iterative development and continuous improvement of the ETAid platform.
3. **Module Development:** Break down the development tasks into smaller modules or components, each focusing on specific features or functionalities of the ETAid platform.
4. **Coding:** Write clean, modular, and maintainable code following best practices and coding standards, ensuring consistency and readability across the codebase.
5. **Integration:** Integrate the developed modules and components to build the complete ETAid platform, ensuring seamless communication and interoperability between different parts of the system.
6. **Testing:** Conduct comprehensive testing of the ETAid platform, including automation testing, to identify and rectify any bugs or issues before publishing.
7. **Performance Optimization:** Optimize the performance of the ETAid platform by addressing bottlenecks, optimizing database queries, and implementing caching mechanisms to ensure fast loading times and responsiveness.
8. **Security Implementation:** Implement robust security measures, including data encryption, authentication, and authorization mechanisms, to protect user data and ensure the confidentiality and integrity of information stored on the ETAid platform.
9. **Documentation:** prepare comprehensive documentation, including user guides and technical manuals, to support users and developers in utilizing and maintaining the platform effectively.
10. **Post-Deployment Support:** Offer ongoing technical support and maintenance services to address any issues, bugs, or feature requests that arise after the deployment of the ETAid platform, ensuring its continued reliability and usability.

1.5 Feasibility

1.4.1 Economic Feasibility

The economic feasibility of the ETAid project is promising, as it aims to create significant economic benefits for both aid recipients and providers. By streamlining access to essential aid services and resources, ETAid has the potential to reduce inefficiencies and redundancies in aid delivery, resulting in cost savings for aid organizations and government agencies. Moreover, the increased accessibility and effectiveness of aid services facilitated by ETAid can contribute to socioeconomic development and poverty reduction in Ethiopian communities, thereby generating long-term economic benefits for the country as a whole.

1.4.2 Technical Feasibility

In terms of technical feasibility, the ETAid project requires a moderate level of technical knowledge and expertise to implement effectively. The development of a bilingual digital platform with features such as centralized information management, real-time communication channels, and user-friendly interfaces necessitates proficiency in software development, database management, and user experience design.

However, with the availability of modern development tools, frameworks, and cloud computing services, as well as a skilled development team, the technical requirements of the ETAid project can be met successfully.

1.4.2 Time Feasibility

The time feasibility of the ETAid project depends on various factors, including the project scope, complexity, and resource availability. Given the importance and urgency of improving access to aid services in Ethiopia, there is pressure to deliver the ETAid platform within a reasonable timeframe. However, it is essential to balance the need for timely delivery with the quality and effectiveness of the final product. With careful project planning, effective resource allocation, and adherence to project timelines, the ETAid project can be completed within the available time frame while meeting the desired quality standards and objectives.

In conclusion, the ETAid project demonstrates promising economic feasibility by generating significant economic benefits for aid recipients and providers. While it requires a moderate level of technical knowledge to implement, the availability of modern development tools and a skilled development team makes it technically feasible. With careful project management and adherence to timelines, the ETAid project can be completed within the available time frame, delivering a digital platform that addresses the critical needs of Ethiopian communities effectively.

Activity	June 1-5	June 6-16	June17-July2	July10-aug27	Aug28-sep15	Responsible
Requirement gathering						All member
Requirement analysis						All member
System design						All member
Implementation						All member
Testing						All member

1.6 Beneficiaries or significant of the project

The ETAid project holds immense significance for various stakeholders and beneficiaries, including:

1. **Ethiopian Communities:** ETAid empowers Ethiopian communities by providing equitable access to essential aid services and resources, thereby improving their livelihoods, well-being, and resilience. By overcoming barriers to access and enhancing awareness, ETAid enables individuals to address their immediate needs and pursue long-term socioeconomic development.
2. **Aid Recipients:** ETAid directly benefits aid recipients by facilitating easier access to critical services such as healthcare, education, employment, and emergency assistance. Through personalized support and educational resources, ETAid empowers individuals to navigate the aid system effectively and advocate for their rights and needs.
3. **Aid Providers:** ETAid enhances the efficiency and effectiveness of aid delivery for providers by centralizing information, streamlining communication, and promoting collaboration among users. By reducing administrative burdens and improving coordination, ETAid enables providers to allocate resources more effectively and focus on delivering impactful services to those in need.
4. **Government Agencies:** ETAid supports government efforts to address social and economic challenges in Ethiopia by complementing existing aid programs and initiatives. By leveraging technology to improve the accessibility and effectiveness of aid services, ETAid contributes to the government's goals of promoting inclusive development and poverty reduction.
5. **Non-Profit Organizations and NGOs:** ETAid provides non-profit organizations and NGOs with a platform to reach and support Ethiopian communities more efficiently and effectively. By connecting organizations with beneficiaries and facilitating communication and collaboration, ETAid enhances the impact and reach of their aid programs and initiatives.
6. **Global Aid Community:** The ETAid project serves as a model for leveraging digital innovation to address humanitarian challenges and improve aid delivery in diverse contexts. By showcasing the potential of technology to empower communities and enhance resilience, ETAid contributes to global efforts to achieve the Sustainable Development Goals and build a more equitable and inclusive world.

In summary, ETAid brings significant benefits to Ethiopian communities, aid recipients, providers, government agencies, non-profit organizations, and the global aid community by improving access to essential services, promoting collaboration, and fostering empowerment and resilience.

1.7 Limitations of the project

The scope of the ETAid project encompasses the development and implementation of a bilingual digital platform aimed at facilitating access to essential aid services and resources for Ethiopian communities. The system will include features such as centralized information management, real-time communication channels, user-friendly interfaces, and personalized user profiles. The platform will serve as a comprehensive aid hub, connecting aid recipients with providers and promoting collaboration among users.

To address the organization's challenges, ETAid provides a centralized solution that streamlines access to aid services, enhances communication and coordination among users, and empowers individuals to navigate the aid system effectively. By leveraging technology and innovation, ETAid aims to improve the

efficiency and effectiveness of aid delivery, ultimately contributing to the organization's mission of supporting Ethiopian communities.

The services to be delivered within the given time frame include:

- Development of the ETAid platform with specified features and functionalities.
- Testing and validation of the platform to ensure usability, functionality, and security.
- Provision of user training and documentation to support platform utilization and maintenance.

Limitations of the Project:

Despite the project's scope and objectives, certain challenges and constraints may arise, hindering the full achievement of the plan. Some potential issues that we might encounter include:

1. **Technical Constraints:** Limited technical expertise or resources may impact the development and implementation of certain features or functionalities of the ETAid platform.
2. **Time Constraints:** Strict project timelines may limit the depth of research, analysis, and testing conducted, potentially leading to compromises in the quality or completeness of the final product.
3. **Resource Constraints:** Insufficient funding may restrict the project's ability to allocate adequate resources for development, and testing activities.
4. **User Engagement:** Limited users engagement or feedback may result in misalignment between the project's objectives and users needs, impacting the platform's usability and effectiveness.
5. **External Factors:** External factors such as changes in regulatory requirements, technological advancements, or socio-political events may introduce additional complexities or uncertainties into the project environment.

Activities Left Undone Due to Constraints:

Due to these constraints, some activities may remain unfinished or incomplete, including:

- **Limited feature development:** Certain planned features or functionalities of the ETAid platform may not be fully implemented or may require further refinement due to technical or resource constraints.
- **Reduced testing and validation:** Limited time or resources may result in abbreviated testing and validation processes, potentially leaving gaps in the platform's functionality or security.
- **Incomplete documentation:** Documentation efforts may be scaled back or postponed, leading to gaps in user guides, technical manuals, or training materials.
- **Deferred deployment or rollout:** Deployment of the ETAid platform to a production environment may be delayed or phased, impacting the platform's availability and accessibility to users.

Despite these challenges, efforts will be made to prioritize essential tasks and deliverables to ensure the successful completion and launch of the ETAid platform within the given time frame, while also maintaining a focus on quality and user satisfaction.

1.8 Scope of the project

The scope of the project encompasses the development of a web application with features focused on donation management and tracking for users, as well as an activity dashboard system for administrators. The key components of the project include:

1. **User Registration and Authentication:** Implement a user registration and authentication system to allow users to create accounts and log in securely.
2. **Donation Management:** Develop a donation management system that enables users to make donations through the web application. This feature will include functionalities such as selecting donation categories, specifying donation amounts, and providing payment information securely.
3. **Donation Tracking:** Implement a donation tracking system that allows users to track the status and impact of their donations. Users should be able to view details such as the amount donated, the recipient organization, and the utilization of funds.
4. **Activity Dashboard for Users:** Create an activity dashboard for users, providing them with personalized insights and analytics related to their donation history, impact, and engagement with the platform. This dashboard should be interactive and user-friendly, allowing users to explore their data easily.
5. **Administrator Dashboard:** Develop an administrator dashboard system with features for monitoring and managing donation activities, user accounts, and platform content. Administrators should be able to view donation analytics, track fundraising progress, and manage user accounts and permissions efficiently.
6. **Reporting and Analytics:** Implement reporting and analytics functionalities for both users and administrators, allowing them to generate customized reports, visualize donation data, and gain insights into donation trends and patterns.
7. **Communication and Notifications:** Integrate communication and notification features to keep users informed about donation opportunities, fundraising campaigns, and platform updates. Users should receive timely notifications via email or in-app notifications.
8. **Security and Compliance:** Ensure that the web application adheres to industry-standard security practices and compliance regulations, including data encryption, secure payment processing, and protection of user privacy.
9. **Scalability and Performance:** Design the web application with scalability and performance in mind to accommodate growth in user traffic and donation activities over time. This includes optimizing database queries, implementing caching mechanisms, and leveraging cloud infrastructure for scalability.

By implementing these features and functionalities, the web application will provide users with a seamless and secure platform for donating, tracking donations, and engaging with donation activities, while administrators will have the tools they need to manage and monitor donation activities effectively.

1.9 Organization of the project

The ETAid project is a collaborative initiative led by 4th-year students of Information Technology at Bahir Dar University. With a passion for using technology to make a positive impact, we are dedicated to addressing the challenges faced by Ethiopian communities in accessing essential aid services and resources.

As members of the Information Technology program, we are aiming to bring a diverse range of skills, knowledge, and expertise to the ETAid project. We are adept at software development, database management, and project management, enabling us to design and implement innovative solutions to complex social problems.

The ETAid project is an extension of our commitment to academic excellence and social responsibility. By leveraging our technical skills and expertise, we aim to create a digital platform that empowers Ethiopian communities to overcome barriers to access and achieve greater self-sufficiency and resilience.

Chapter Two: System features

2.1The ExistingSystem

The ETAid project has made significant strides in its development journey, with approximately 80% completion achieved in key areas. In the backend, the system boasts nearly full functionality for users, along with 80% completion for administrators, providing essential system support. Furthermore, substantial progress has been made in integrating third-party services such as payment methods, authentication mechanisms, and email integrations. Additionally, language support for the API is currently under development to ensure inclusivity and accessibility for all users.

Technologically, the project leverages **Node.js** and **Express.js** for the backend, along with **MongoDB** for database management, enabling robust and scalable functionality. On the frontend, Vue.js 3 Composition API and Tailwind CSS are employed to craft intuitive and visually appealing user interfaces. While the backend is nearing completion, the frontend development is currently focused on crafting foundational user pages such as landing and authentication pages, laying the groundwork for a seamless user experience.

Despite the substantial progress achieved, we remain dedicated to refining and enhancing the system to meet the highest standards of functionality, usability, and performance. With continued collaboration, iteration, and refinement, the ETAid project is on track to deliver a transformative digital platform that empowers Ethiopian communities and facilitates equitable access to essential aid services and resources.

2.2 Proposed System

1. **Geographical Barriers:** To address geographical barriers hindering access to aid services, ETAid will implement a mobile-responsive web application accessible from anywhere with an internet connection. Additionally, partnerships with local community centers or mobile outreach programs can extend access to remote areas.
2. **Linguistic Barriers:** ETAid will provide bilingual support in Amharic and English to ensure inclusivity. This includes translating user interfaces, content, and communication channels into both languages, enabling users to navigate the platform comfortably in their preferred language.
3. **Fragmented Service Delivery:** The centralized platform of ETAid will streamline service delivery by consolidating information about available aid services, resources, and providers. This enables users to access a comprehensive directory of services and facilitates coordination among aid organizations, reducing redundancies and gaps in service coverage.
4. **Inequitable Distribution:** ETAid will utilize data analytics and mapping functionalities to identify underserved areas and populations, allowing aid providers to target resources more effectively. Additionally, awareness campaigns and community engagement initiatives can empower marginalized groups to access and advocate for their needs.
5. **Limited Information and Awareness:** ETAid will prioritize user education and awareness through interactive tutorials, informative content, and regular updates about available aid services

and resources. Integration with SMS or email notification systems can further disseminate information to users, ensuring they stay informed about relevant opportunities and developments.

2.3 Requirement Analysis

2.3.1 Functional Requirement

FREQ-1: User Registration (High Priority) Description: Users should be able to register for an account on the ETAid platform, providing basic information such as name, email, and password.

FREQ-2: User Login (High Priority) Description: Registered users should be able to log in to their accounts securely using their email and password.

FREQ-3: Donation Submission (High Priority) Description: Users should be able to submit donations through the ETAid platform, specifying the amount, donation category, and payment method.

FREQ-4: Donation Tracking (High Priority) Description: Users should be able to track the status and impact of their donations, including information such as donation history, recipient organizations, and utilization of funds.

FREQ-5: Language Selection (Medium Priority) Description: Users should have the option to select their preferred language (Amharic or English) for navigating the ETAid platform.

FREQ-6: Donation Categories (Medium Priority) Description: Users should be able to browse and select from a list of predefined donation categories, such as healthcare, education, disaster relief, etc.

FREQ-7: Communication Preferences (Medium Priority) Description: Users should be able to customize their communication preferences, opting in or out of email notifications, and other updates from ETAid.

FREQ-8: User Profile Management (Low Priority) Description: Users should have the ability to update their profile information, change their password, and manage their communication preferences.

FREQ-9: Feedback and Support (Low Priority) Description: Users should have a way to provide feedback, report issues, and seek support from the ETAid team, either through a contact form or live direct contact support feature.

2.3.2 System Use Case

2.3.2.1 Use case Diagram

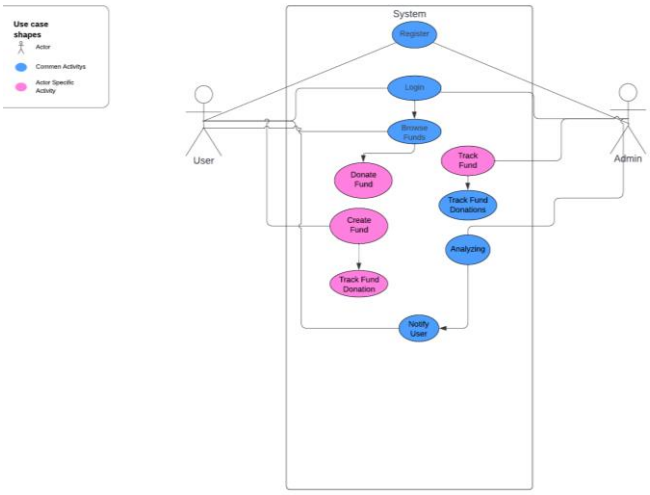


Figure 2.

No	Use Case	Description
1	Registration	User Registration And Authorization.
2	Login	User Authentication.
3	Browse Funds	Allow to browse open funds for donation.
4	Donate Funds	Allow to donate to the funds.
5	Create Funds	Allow to create and post new Fund for donation.
6	Track Fund Donation	Track the donation of the opened fund.
7	Notifications	Allow to get notification of the user activity.
8	Analyzing	Overall Analyzing for donation and funds both for the admin and the user.

Table 2.

Use Case Name	Login
Actors	Administrators, Users

Description	The actors should inter credential to enter to the web application
Precondition	The Administrator should have the access for the dashboard by the roll of admin
Post Condition	The System should give user interface for the authentication
Basic Course of Action	1. Admin or user Want to login 2. Click the login Button 3. Fill the basic form 4. Send the request 5. If it is correct allow them to access
Alternative Course of Action	1. If authentication fails the user prompted to authenticated again 2. Otherwise if the user forgot password he can ask to change the password by his email

Table 3.

Use Case Name	Registration
Actors	Users
Description	The actors should inter credential to enter to the web application also providing some basic information about himself
Precondition	The user should have the access for the web by the roll of user
Post Condition	The System should give user interface for the registration
Basic Course of Action	1. user Want to join the system 2. Click the register Button 3. Fill the basic form 4. Send the request 5. If it is correct allow them to access
Alternative Course of Action	1. If authentication fails the user prompted to authenticated again

Table 4.

Use Case Name	Browse Funds

Actors	Users
Description	The actors can inter some filtering parameters to filter some funds that he can donate
Precondition	–| –
Post Condition	The System should give user interface for the list of the funds
Basic Course of Action	1. The user navigate to funds page 2. The user search for the fund that he is interested
Alternative Course of Action	–| –

Table 5.

Use Case Name	Donate Fund
Actors	Users
Description	The actor should select one fund to donate and inter the amount of money that he wants to donate and perform the transaction using the chapa payment gateway.
Precondition	The user should be authenticated
Post Condition	The user should be notified after the transaction is completed
Basic Course of Action	1. The user clicks the donate button 2. The user fill the amount to donate 3. The user perform the transaction using chapa payment gateway 4. The user should be notified after the action is completed
Alternative Course of Action	The user should be informed that the transaction is canceled without the transfer.

Table 6.

Use Case Name	Create Fund
Actors	Users

Description	The actors can share some information about the fund to post a fund for all users.
Precondition	The user must be authenticated by the system before the user is trying to post funds.
Post Condition	The user should be notified after the fund is created.
Basic Course of Action	1. The user navigate to create fund page 2. The user fill some form about the fund 3. The user clicks the create button to register the fund 4. The user waits until it's fund is registered
Alternative Course of Action	The user should be notified that he can not post funds because of other conditions like network error, reported user e.t.c

Table 7.

Use Case Name	Track Fund donations
Actors	Users,Administrators
Description	The actors can get information about the donation done on their behalf of their fund.
Precondition	The user should be registered and authenticated and also the user should create or post fund
Post Condition	–| –
Basic Course of Action	1. The user navigate to specific fund detail page 2. The user get lists of users and the amount of money raised for the fund
Alternative Course of Action	The user should be prompted that there is no any fund donation track for his posted fund.

Table 8.

Use Case Name	Notifications
Actors	Users,Administrators

Description	The actors can get update information about the donation,fund and any other activity.
Precondition	The user should be registered and authenticated.
Post Condition	–| –
Basic Course of Action	1. The user navigate to his header 2. The user gets lists of notifications to see the updated notifications.
Alternative Course of Action	The user should be prompted that there is no any notification information for his activity.

Table 9.

Use Case Name	Analyzing
Actors	Users,Administrators
Description	The actors can get the overall analysis of the fund and specific funds and also the donations
Precondition	The actor should be authenticated or some of them can be seen publicly
Post Condition	–| –
Basic Course of Action	1. The user navigates to the funds list to see the fund progress analysis.
Alternative Course of Action	The user should be prompted that there is no any notification information for his activity.

Table 10.

2.3.2.2 Use case Documentation

Use Case: Manage Campaign

Actors: User (Donor), Admin

Description: The "Manage Campaign" use case allows authenticated users (donors) and administrators to create and track donation campaigns within the ETAid platform.

1. User (Donor) Perspective:
    - The user logs in to the ETAid platform using their credentials.
    - Once authenticated, the user can create a new campaign by providing campaign details such as title, description, target amount, and duration.

    - The user can track the progress of their campaign, including the total amount raised and the number of donors contributing.
2. Admin Perspective:
    - The admin accesses the ETAid platform using their administrative privileges.
    - The admin can view a list of all active campaigns created by users.
    - The admin can track donation activity associated with each campaign, including donor information and contribution amounts.
    - The admin can monitor the overall performance of campaigns and intervene if necessary to promote or support specific campaigns.

This use case enables both users and administrators to actively participate in the creation, management, and tracking of donation campaigns within the ETAid platform, fostering community engagement and transparency in the aid delivery process.

2.3.3 Business Rule Documentation

1. Users must be authenticated before accessing campaign creation and donation functionalities.
2. Only authenticated users can create new campaigns within the platform.
3. Campaign creators must provide necessary details such as title, description, target amount, and duration.
4. Campaign creators can track the progress of their campaigns, including total amount raised and number of donors.
5. Users can donate to campaigns created by others after authentication.
6. Administrators have access to all campaign information and donation activities within the platform.
7. Administrators can monitor the overall performance of campaigns and intervene if necessary.
8. All donations are securely processed through integrated payment methods.
9. Users must comply with the platform's terms of service and community guidelines.
10. Any suspicious or fraudulent activities will be investigated and may result in account suspension or legal action.
11. The platform will maintain confidentiality and privacy of user information in accordance with data protection regulations.
12. The platform may provide additional support or promotion for campaigns at the discretion of the administrators.

2.3.4 User Interface Prototyping

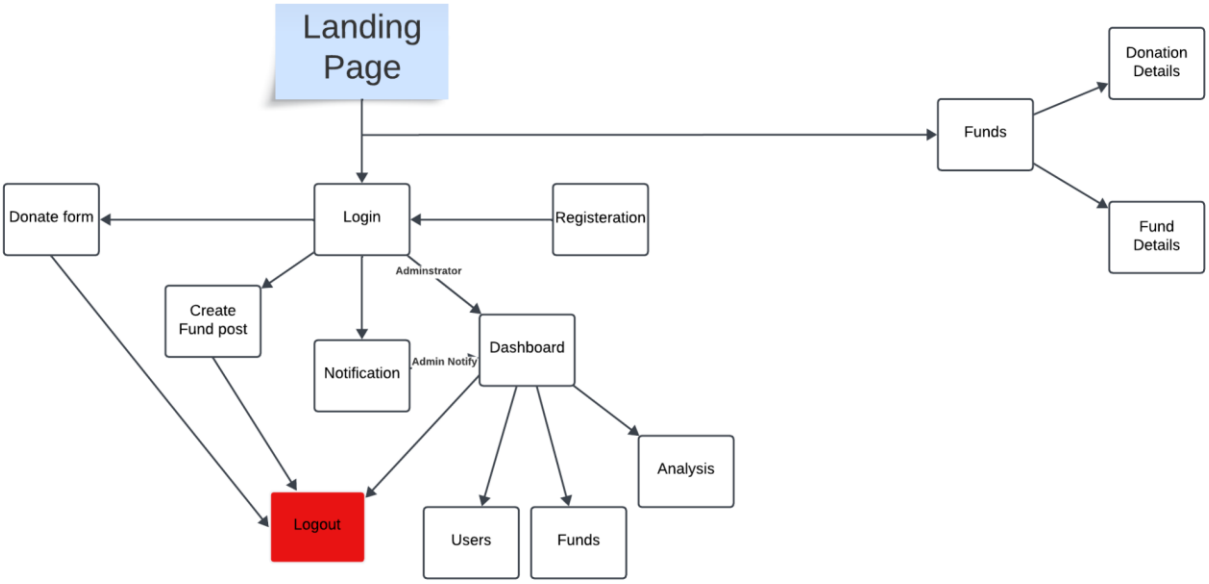


Figure 3.

2.3.5 Donation Activity Diagram

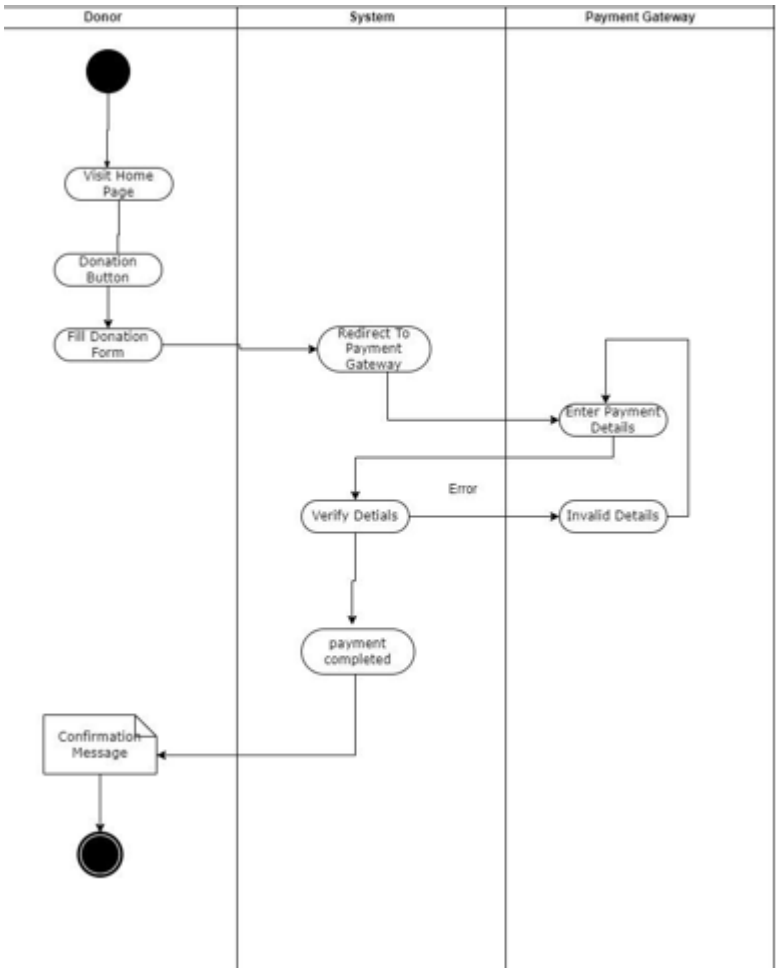


Figure 4.

2.3.6 U.M.L Diagram

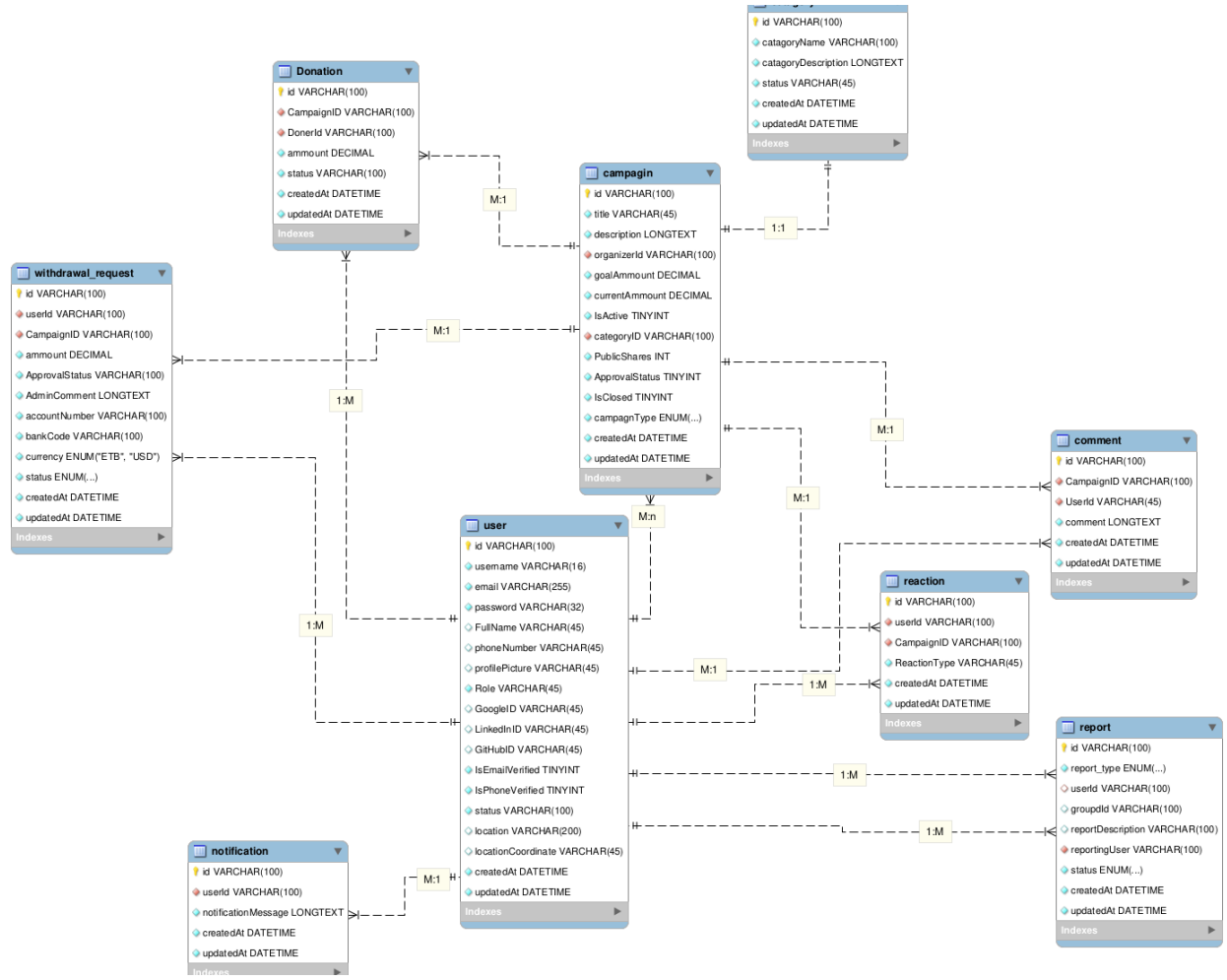


Figure 5.

2.3.7 State Chart Diagram

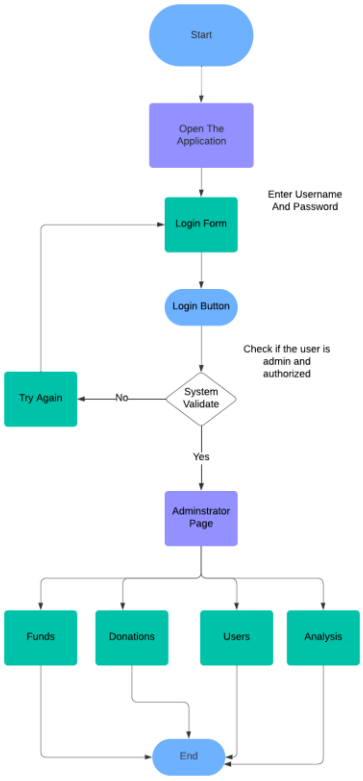
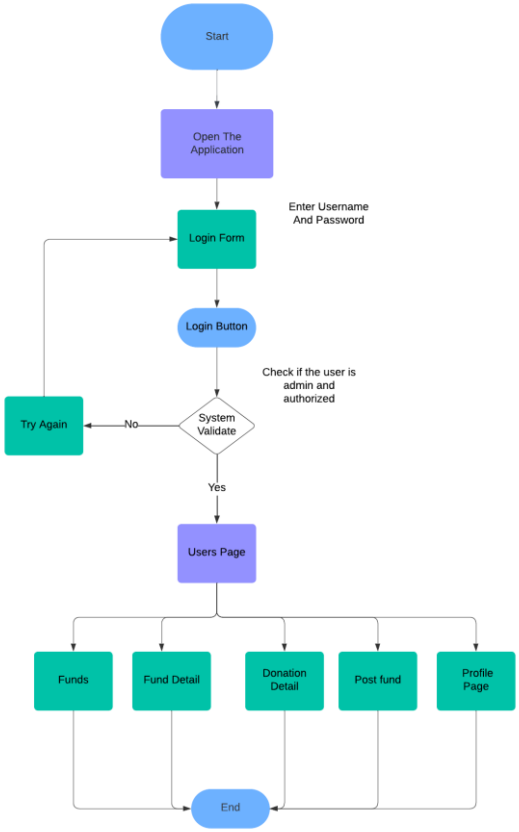


Figure 6.



2.5 System Requirement

2.5.1 Hardware Requirements

To run the ETAid application locally on a laptop, the following hardware specifications are recommended:

1. **RAM (Random Access Memory):** A minimum of 4 GB of RAM is required to ensure smooth performance of the application. However, for optimal performance, it is recommended to have more than 4 GB of RAM, especially if running multiple applications simultaneously or dealing with large datasets.
2. **Storage:** A laptop with at least 100 GB of storage capacity is recommended to accommodate the application files, database, and any additional data generated or downloaded during usage. Solid-state drives (SSDs) are preferred over traditional hard disk drives (HDDs) for faster data access and better overall performance.
3. **Processor (CPU):** A modern multi-core processor (such as Intel Core i5 or higher, or AMD Ryzen equivalent) is recommended to handle the computational demands of the application efficiently. Higher clock speeds and more cores can contribute to faster processing and better responsiveness.

4. **Operating System:** The laptop should be running a supported operating system, such as Windows 10, macOS, or a Linux distribution (e.g., Ubuntu). Ensure that the operating system is up-to-date with the latest patches and updates to maintain security and compatibility with the application.
5. **Graphics:** While not critical for running the ETAid application, a dedicated graphics card (GPU) can improve visual performance and support graphics-intensive tasks such as data visualization or multimedia processing. Integrated graphics processors (IGPs) found in most modern laptops should suffice for basic usage.
6. **Connectivity:** A stable internet connection is required to access online features and services, such as authentication, data synchronization, and external integrations (e.g., payment gateways). Ensure that the laptop has built-in Wi-Fi or Ethernet connectivity options for internet access.
7. **Ports:** Check for the availability of USB ports, HDMI ports, and other connectivity options based on your specific needs. This will allow you to connect external devices such as peripherals, external monitors, or storage devices as required for your workflow.

By meeting or exceeding these hardware requirements, users can ensure optimal performance and functionality when running the ETAid application locally on their laptop.

2.5.2 Software Requirements

To run the ETAid application locally on a laptop, the following software components must be installed:

1. **Node.js:** The latest version of Node.js must be installed on the laptop. Node.js is a JavaScript runtime environment that allows the execution of JavaScript code outside of a web browser. It is required for running the backend server and executing server-side JavaScript code.
2. **Vue CLI:** Vue CLI (Command Line Interface) is a command-line tool for scaffolding Vue.js projects, managing dependencies, and building production-ready applications. It is used to set up and manage the Vue.js frontend of the ETAid application. Install Vue CLI globally using npm (Node Package Manager).
3. **npm (Node Package Manager):** npm is the default package manager for Node.js, used for installing, managing, and updating dependencies for JavaScript projects. It is required for installing Vue CLI and other project dependencies. Ensure that npm is installed along with Node.js.
4. **MongoDB Database:** MongoDB is a NoSQL database used for storing and managing data in the ETAid application. Install MongoDB locally on the laptop and ensure that the MongoDB server is running to enable data storage and retrieval operations by the backend server.
5. **Performant Browser:** A performant web browser is required to run the frontend of the ETAid application locally. Use the latest version of popular web browsers such as Google Chrome, Mozilla Firefox, or Microsoft Edge for optimal performance and compatibility. Ensure that the browser supports modern web standards and features required by the Vue.js frontend.

By fulfilling these software requirements, users can set up and run the ETAid application locally on their laptop, enabling development, testing, and debugging of the application in a local environment.

2.6 Key abstraction with CRC analysis

To identify the concepts and things that are important for the system, let's consider the key entities and their interactions within the ETAid system:

1. **User (Donor):** Represents individuals who donate funds or resources through the ETAid platform.
2. **User (Recipient):** Represents individuals or organizations receiving aid or support through donations.
3. **Campaign:** Represents fundraising campaigns created by users to raise funds for specific causes or projects.
4. **Donation:** Represents individual contributions made by users towards campaigns.
5. **Administrator:** Represents system administrators responsible for managing and overseeing the platform.
6. **Authentication System:** Represents the system component responsible for authenticating users before accessing certain functionalities.
7. **Payment Gateway:** Represents third-party services integrated with the platform to facilitate secure payment transactions.
8. **Database:** Represents the data storage system used to store information about users, campaigns, donations, and other entities.

Now, let's create CRC (Class-Responsibility-Collaboration) cards for each of these concepts:

1. **User (Donor):**
    - Responsibilities:
        - Register an account.
        - Log in to the system.
        - Create new campaigns.
        - Make donations to campaigns.
    - Collaborators: Campaign, Donation, Authentication System.
2. **User (Recipient):**
    - Responsibilities:
        - Receive donations from users.
        - Provide updates on campaign progress.
    - Collaborators: Campaign, Donation.
3. **Campaign:**
    - Responsibilities:
        - Create a new fundraising campaign.
        - Track campaign progress.
        - Receive donations from users.

- Collaborators: User (Donor), User (Recipient), Donation.

4. **Donation:**
   - Responsibilities:
     - Record details of individual donations.
     - Associate donations with specific campaigns.
   - Collaborators: User (Donor), Campaign.
5. **Administrator:**
   - Responsibilities:
     - Monitor and manage user accounts.
     - Monitor campaign activities and donations.
     - Provide support and assistance as needed.
   - Collaborators: User (Donor), User (Recipient), Campaign, Donation.
6. **Authentication System:**
   - Responsibilities:
     - Verify user credentials during login.
     - Grant access to authorized users.
   - Collaborators: User (Donor), User (Recipient), Administrator.
7. **Payment Gateway:**
   - Responsibilities:
     - Process payment transactions securely.
     - Provide confirmation of successful transactions.
   - Collaborators: User (Donor), Campaign.
8. **Database:**
   - Responsibilities:
     - Store and retrieve data related to users, campaigns, and donations.
     - Ensure data integrity and security.
   - Collaborators: All system components interacting with data storage.

These CRC cards help identify the key responsibilities and collaborations of each concept within the ETAid system, laying the foundation for developing a class diagram that represents the relationships between these entities.

2.6.1 Conceptual modeling: Class diagram

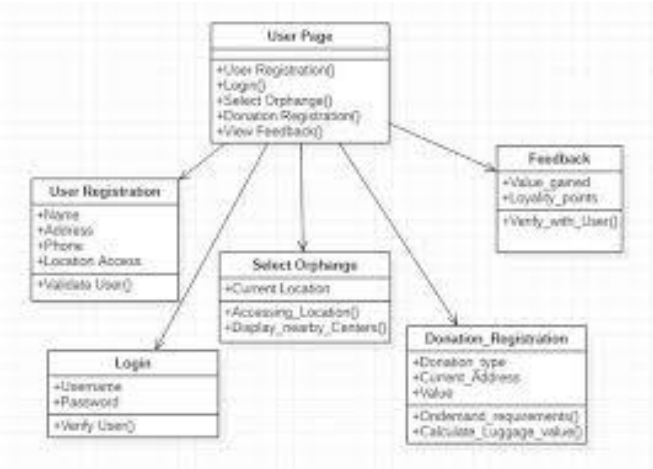


Figure 8.

2.6.2 Identifying change cases

There is a potential change requirement to integrate social media functionality into the ETAid platform. This would allow users to share campaign updates, donation milestones, and success stories on popular social media platforms such as Facebook, Twitter, and Instagram.

The likelihood of this change occurring is moderate to high. As social media integration becomes increasingly common in digital platforms, users may expect ETAid to provide easy sharing options for spreading awareness and soliciting support for campaigns.

The potential impact of adding social media integration includes:

1. **Increased User Engagement**: Social media integration can enhance user engagement by facilitating sharing of campaign-related content with wider audiences, leading to increased visibility and participation.
2. **Expanded Reach:** By leveraging social media platforms, ETAid can reach new audiences beyond its existing user base, potentially attracting more donors and supporters to the platform.
3. **Marketing and Promotion:** Social media integration can serve as a marketing and promotional tool for ETAid, helping to raise awareness about its mission and impact, and attracting attention from potential donors, volunteers, and partners.
4. **Technical Complexity:** Implementing social media integration may require additional development effort and technical expertise to ensure seamless integration with various social media APIs and platforms. This could impact development timelines and resource allocation.
5. **Privacy and Security Considerations:** ETAid must carefully consider privacy and security implications when integrating with social media platforms, ensuring compliance with data protection regulations and safeguarding user information shared via social media channels.

Overall, while the addition of social media integration presents opportunities for enhancing user engagement and expanding the reach of ETAid, it also poses technical and operational challenges that need to be carefully addressed to ensure successful implementation and minimize potential risks.

Chapter 3: System Design

The purpose and design goals of the ETAid system encompass various criteria aimed at delivering a robust, user-friendly, and impactful platform for aiding Ethiopian communities. Below are the explanations of the purpose and design goals using different criteria:

1. **Performance:**
    - Purpose: The ETAid system aims to deliver optimal performance, ensuring that users can access and interact with the platform swiftly and efficiently.
    - Design Goals:
        - Fast Response Times: The system should respond promptly to user interactions, minimizing loading times and delays.
        - Scalability: The platform should be able to handle increasing user traffic and data volume without compromising performance.
        - Resource Efficiency: Efficient resource utilization, such as memory and processing power, should be prioritized to maximize system performance.
2. **Dependability:**
    - Purpose: ETAid seeks to establish trust and reliability among users, ensuring that the platform operates consistently and securely.
    - Design Goals:
        - Reliability: The system should operate reliably under normal conditions, minimizing downtime and service disruptions.
        - Data Integrity: Measures should be in place to ensure the integrity and accuracy of data stored and processed within the system.
        - Security: Robust security measures should be implemented to safeguard user information, prevent unauthorized access, and mitigate security threats.
3. **End User Experience:**
    - Purpose: ETAid aims to provide a seamless and intuitive user experience, enabling users to navigate the platform effortlessly and accomplish their goals effectively.
    - Design Goals:
        - User-Friendly Interface: The platform should feature an intuitive and visually appealing interface that is easy to navigate and understand.
        - Accessibility: The system should be accessible to users of diverse backgrounds and abilities, adhering to accessibility standards and guidelines.
        - Personalization: Customization options should be available to allow users to personalize their experience and preferences within the platform.
4. **Scalability:**
    - Purpose: As ETAid grows and evolves, the system should be able to scale seamlessly to accommodate increasing user demands and evolving requirements.
    - Design Goals:
        - Horizontal Scalability: The architecture should support horizontal scaling, allowing the system to distribute workload across multiple servers or instances as needed.

- Elasticity: The system should be able to dynamically adjust resources based on fluctuating demand, scaling up or down to meet changing requirements.
- Load Balancing: Load balancing mechanisms should be in place to evenly distribute incoming traffic and ensure optimal resource utilization across servers.

5. **Flexibility and Adaptability:**
    - Purpose: ETAid aims to remain adaptable to changing needs and requirements, allowing for future enhancements and improvements.
    - Design Goals:
        - Modular Architecture: The system should be designed with modular components that can be easily modified, replaced, or extended to accommodate new features or functionalities.
        - API Integration: Open APIs should be provided to enable seamless integration with third-party services, allowing for the incorporation of new technologies and capabilities.
        - Agile Development: Agile methodologies should be employed to facilitate iterative development and rapid adaptation to evolving user feedback and market trends.

By addressing these criteria in the purpose and design goals of the ETAid system, the platform can effectively fulfill its mission of digitizing the online aiding platform for Ethiopians while prioritizing performance, dependability, user experience, scalability, and adaptability.

3.1 Architectural Design

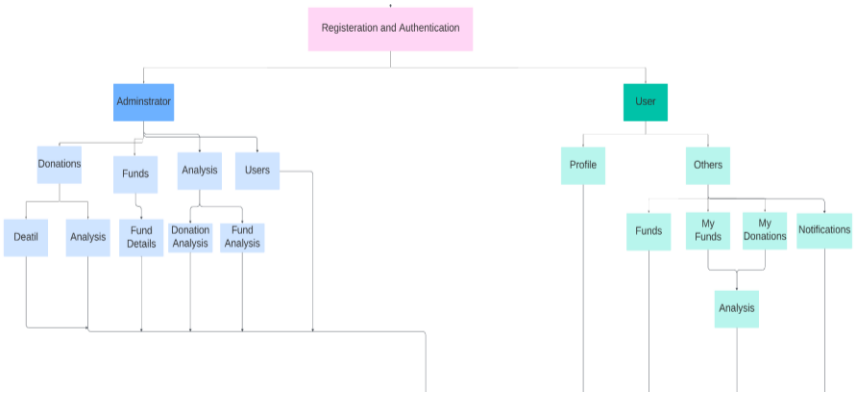


Figure 9.

The ETAid system follows a modular and scalable architectural design to support its functionality and accommodate future growth. The architecture comprises three main components:

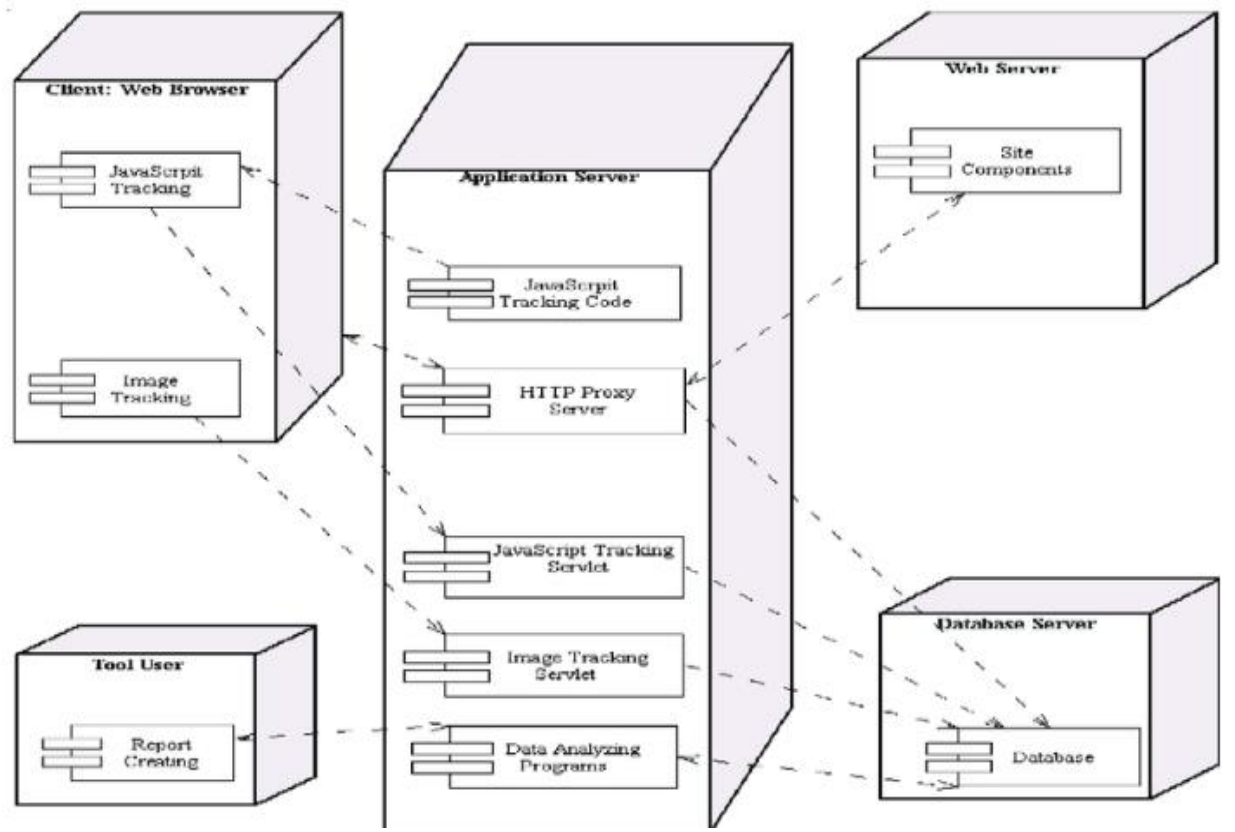
1. **Frontend:** The frontend is developed using Vue.js, leveraging the Vue CLI for project scaffolding and management. The frontend provides an intuitive and responsive user interface for interacting with the system, including features such as user registration, campaign creation, donation submission, and campaign tracking. Tailwind CSS is utilized for styling and layout consistency, ensuring a visually appealing and cohesive user experience.

2. **Backend:** The backend is built using Node.js and Express.js, providing a RESTful API for communication between the frontend and the database. MongoDB is employed as the database management system for storing and managing data related to users, campaigns, donations, and other entities. Authentication and authorization mechanisms are implemented using JSON Web Tokens (JWT) to ensure secure access to system functionalities and protect user data.
3. **Database:** MongoDB serves as the NoSQL database for storing structured and unstructured data in a scalable and flexible manner. The database schema is designed to accommodate the dynamic nature of campaign and donation data, allowing for easy retrieval and manipulation of information. Indexing and query optimization techniques are employed to enhance database performance and efficiency, ensuring timely access to relevant data for system operations.

Overall, the ETAid architectural design prioritizes modularity, scalability, and security, enabling the system to effectively manage user interactions, process data, and support future enhancements and expansions. By following best practices and leveraging modern technologies, the architecture lays a solid foundation for the development and deployment of a reliable and efficient online aiding platform for Ethiopian communities.

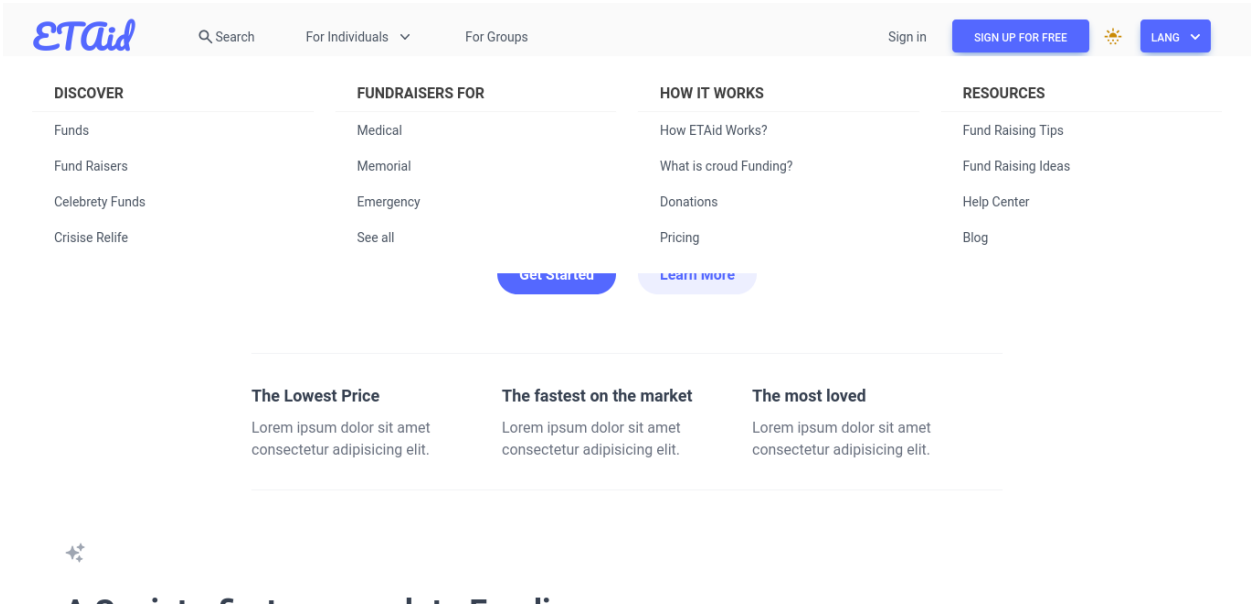
3.1.1 Deployment Modeling

Deployment diagrams show how they are deployed in hardware. The purpose of deployment diagrams can be described as:



3.2 User InterfaceDesign

The user interface (UI) design of the ETAid platform focuses on simplicity, intuitiveness, and accessibility to ensure a seamless user experience for donors, recipients, and administrators. The UI is designed with a clean and modern aesthetic, featuring intuitive navigation, clear visual hierarchy, and concise messaging to guide users through the platform's functionalities.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Fund Raisers
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Emergency
See all
HOW IT WORKS
How ETAid Works?
What is croud Funding?
Donations
Pricing
RESOURCES
Fund Raising Tips
Fund Raising Ideas
Help Center
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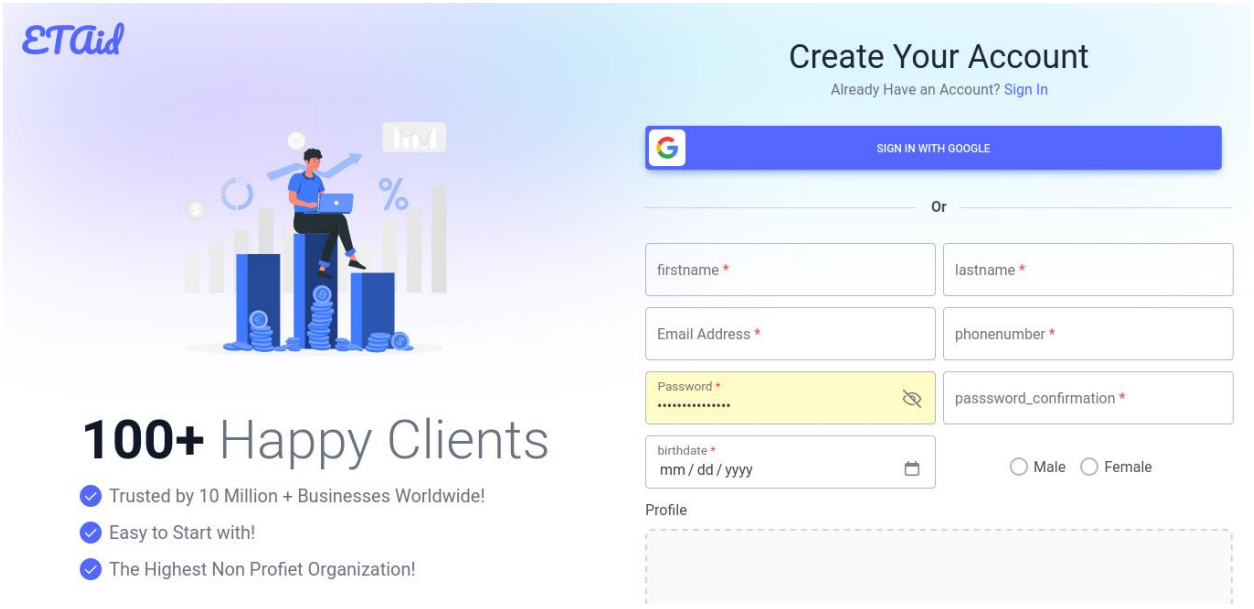
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Trusted by 10 Million + Businesses Worldwide!
Easy to Start with!
The Highest Non Profiet Organization!
Create Your Account
Already Have an Account? Sign In
SIGN IN WITH GOOGLE
Or
firstname *
lastname *
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phonenumber *
Password *
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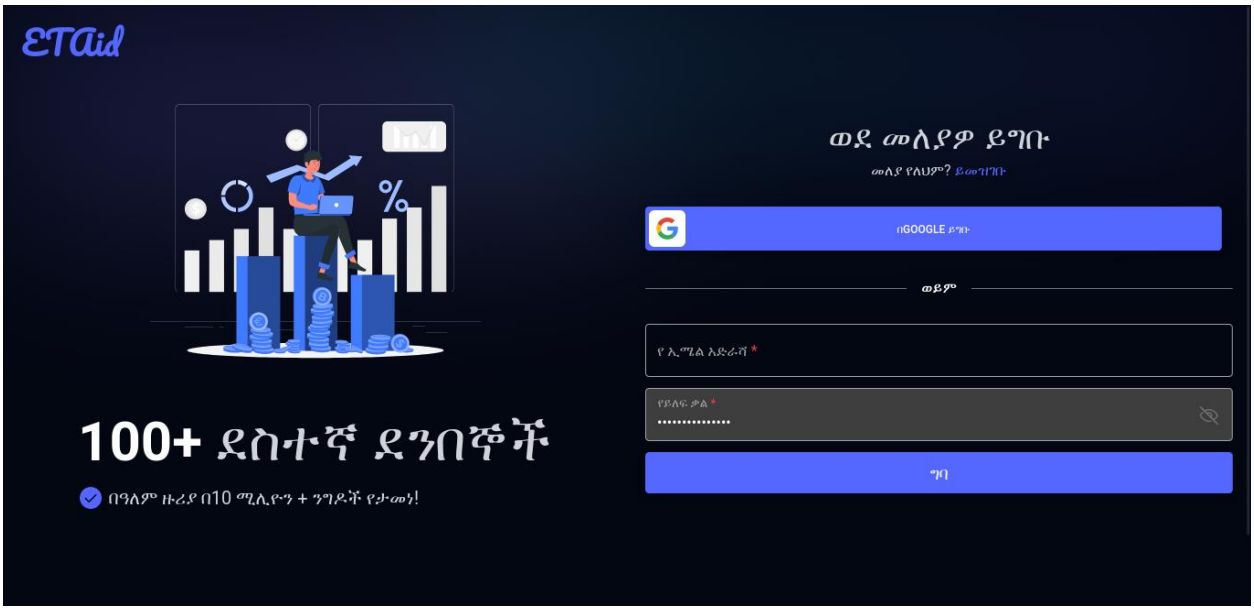


Figure 12.

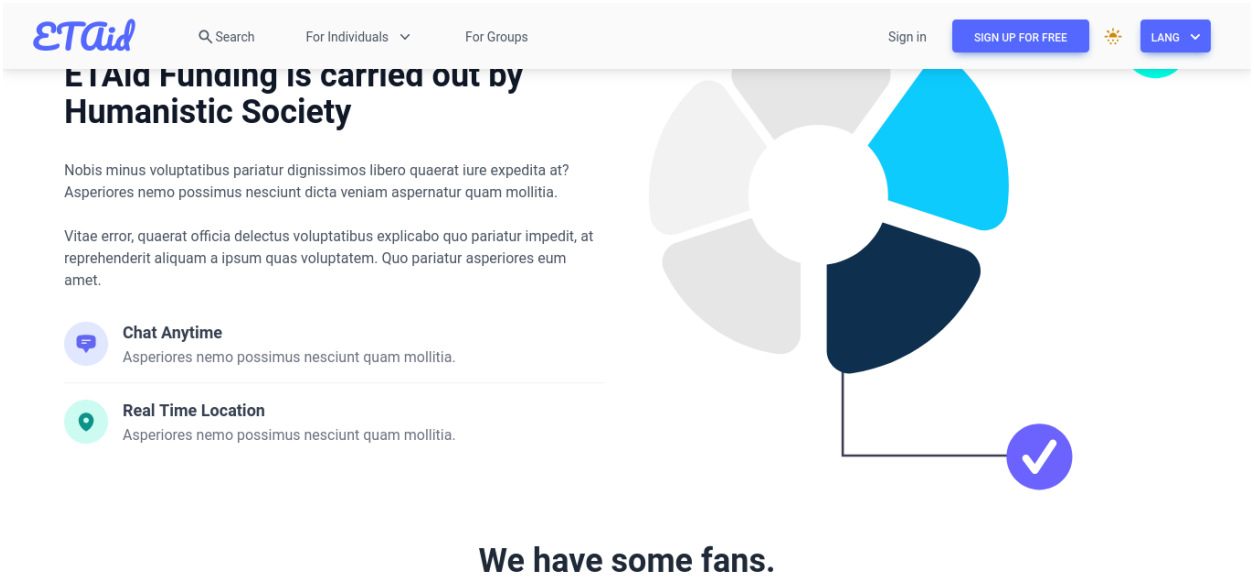


Figure 13.

The above pictures illustrate the mug-shot of the project which is now under development.

3.4 Access control and security

In the ETAid system, access controls are implemented based on role-based authentication using JSON Web Tokens (JWT). Different actors (users) within the system are assigned specific roles, each with predefined permissions to access certain functionalities and data. The following access controls outline the permissions associated with each role:

1. **User (Donor):**
    - Permissions:
        - View and browse active campaigns.
        - Create new campaigns.
        - Make donations to campaigns.
        - Track the progress of their own donations and campaigns.
    - Restrictions:
        - Cannot access administrative functionalities or view sensitive user data.
2. **User (Recipient):**
    - Permissions:
        - View and browse active campaigns.
        - Receive donations from users.
        - Provide updates on campaign progress.
    - Restrictions:
        - Cannot create or manage campaigns.
        - Limited access to administrative functionalities.
3. **Administrator:**
    - Permissions:
        - View and manage all campaigns, donations, and user accounts.
        - Monitor user activities and donation transactions.
        - Provide support and assistance to users.
    - Restrictions:
        - None (Full access to all functionalities and data).

Access controls are enforced using JWT-based authentication and authorization mechanisms. Upon successful authentication, users receive a JWT containing their role information and access permissions. This JWT is then included in subsequent requests to the API, allowing the server to verify the user's identity and authorize access to specific endpoints and resources based on their role.

Access control checks are performed at the API level, where each endpoint is protected by middleware that verifies the user's JWT and role before allowing access. If the user's role does not have sufficient permissions to access the requested functionality or data, the API responds with a 401 Unauthorized error, denying access to the resource.

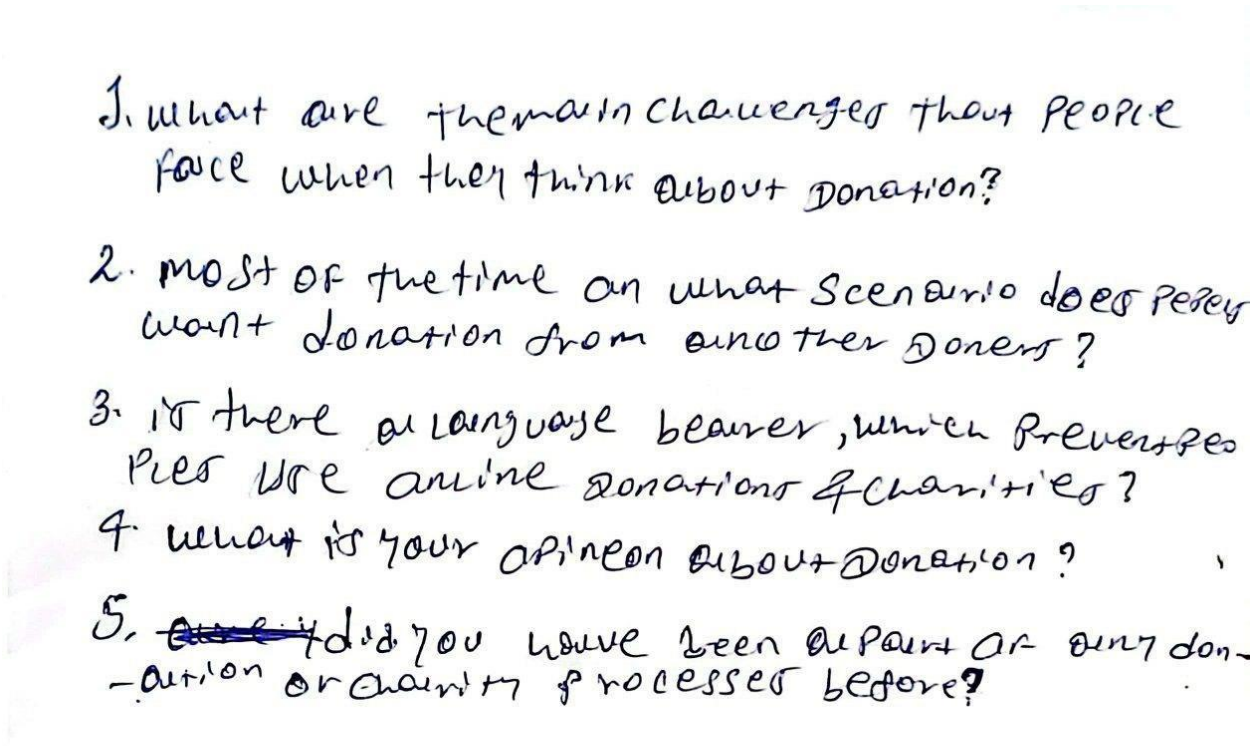
By implementing role-based authentication with JWT, the ETAid system ensures that access to functionalities and data is restricted based on the user's role, thereby maintaining security and confidentiality while facilitating efficient collaboration and interaction within the platform.

References

1. **Node.js Documentation:**
   - Node.js Documentation
2. **Vue.js 3 Documentation:**
   - Vue3 Documentation
3. **Tailwind CSS Documentation:**
   - Tailwind CSS Documentation
4. **Tailwind UI Documentation:**
   - TW-Elements Documentation
5. **USE-CASE Diagram**
   - Use-Case-Diagram

Appendix

This is the question we have been asking some peoples for requirement gathering and analyzing:



1. What are the main challenges that people face when they think about Donation?
2. most of the time on what scenario does peoples want donation from another Doners?
3. is there a language beaver, which prevents pies use online donations & charities?
4. what is your opinion about Donation?
5. ~~Are~~ did you have been apart or any donation or charity processes before?