Rays Of Hope

FINAL REPORT

CMSE 322

PROJECT NO : 11

GROUP NO : 01

PROJECT NAME : Rays Of Hope

PROJECT START DATE :24/05/2023

PROJECT END DATE : 31/05/2023

SUPERVISOR : Assoc. Prof. Dr. Duygu Çelik Ertuğrul

SEMESTER TERM : Spring 2022-2023

Computer Engineering Department

Eastern Mediterranean University

Term: Spring 2022-2023

ABSTRACT

This report has been done to provide the detailed information about Foster Family/Sponsorship System (Rays of Hope) which was developed through the past 3 months by our team Mahamat Hassan, Fares Arnous, Nour Barakat and Rama Ayache. Many children throughout the globe and in our nation are dealing with problems like starvation, poverty, desolation, and homelessness because of earthquakes, diseases, and other catastrophes. The main purpose of this Project is to make it simple for users (who voluntarily sign up to be foster families or sponsors with financial support) to find and contact these children and provide help for them. For design phase, we used Modelio, Adobe Ai, Figma, EdrawMax, LucidChart. Whereas for implementation phase, we used HTML, CSS, Python and MySQL. By the help of such system children in need will be helped as much as possible.

Keywords: Orphans, Volunteers, Aids, Sponsors, Foster family, Vulnerable child(ren), Help, Disaster(s), Poverty, Hunger, HTML, CSS, Python and MySQL.

Table of Contents

LIST OF FIGURES

LIST OF TABLES

1. INTRODUCTION

The planned project would be a multi-layered charitable initiative with a goal of assisting orphans and vulnerable kids from low-income families. Many children throughout the globe and in our nation are dealing with problems like starvation, poverty, desolation, and homelessness because of earthquakes, diseases, and other catastrophes. The goal of this mobile/web application is to make it simple for users (who voluntarily sign up to be foster families sponsors with financial support) to find and contact these children and provide help to them.

The main purpose of this project is to connect a large number of people who are willing to volunteer in different forms with children who are suffering from several issues such as homelessness. The system will contribute to achieve this purpose by being an innovative user-friendly website which aids volunteers through several creative features that it has. For instance, English/Turkish language versions, light/dark mode, chatbot which is equipped with an automatic translator, so that language will not be a barrier. It is an AI feature, which will enhance effective communication between volunteers/sponsors and orphans/vulnerable children.

Our system will allow the children of our country to be helped from people all around the world. Moreover, other existing similar systems such as CarePortal application is also considered one of our competitors as it solves the same problem. Also, volunteers will be providing financial and moral aids which will allow them to have normal social and academic life that they needed to have.

2. PROJECT PLANNING AND MANAGEMENT

2.1 Preliminary Project Information

Project No	11
Project Name	Foster Family/Sponsorship Program
Start Date	11/03/2023
End Date	31/05/2023
Time	3 months

Team information

Project Manager			
Name Surname	Fares Arnous	**ID No**	20801168
Title/Role	Project manager, System analyst		
Address	North Cyprus, Famagusta, Tekant area		
Phone	+90 533 885 51 81		
Email	20801168@emu.edu.tr		

Student 1			
Name Surname	Mahamat Hassan	**ID No**	20910394
Title/Role	Database developer, Programming leader		
Address	North Cyprus, Famagusta, Tekant area		
Phone	+90 533 867 28 37		
Email	20910394@emu.edu.tr		

Student 2			
Name Surname	Nour Barakat	**ID No**	20911132
Title/Role	User Interface Designer, Programmer		
Address	North Cyprus, Famagusta, Tekant area		
Phone	+90 533 855 88 03		
Email	20911132@emu.edu.tr		

Student 3			
Name Surname	Rama Ayache	**ID No**	20801171
Title/Role	Tester, System analyst		
Address	North Cyprus, Famagusta, Tekant area		
Phone	+90 533 858 72 02		
Email	20801171@emu.edu.tr		

2.2 Aim, Purpose, and Target Users

The planned project would be a multi-layered charitable initiative with a goal of assisting orphans and vulnerable kids from low-income families. Many children throughout the globe and in our nation are dealing with problems like starvation, poverty, desolation, and homelessness because of earthquakes, diseases, and other catastrophes. The goal of this mobile/web application is to make it simple for users (who voluntarily sign up to be foster families sponsors with financial support) to find and contact these children and provide help to them.

The main purpose of developing this project is to establish a global network of support for children, orphans, and vulnerable kids in unstable countries such the ones which prone of earthquakes with best necessary services can be gathered for their needs, since uncountable number of children struggling from delay of receiving support on

time, we are focusing on delivering the help in shortest time possible. Our aim in this web system is to make it simple for users (who voluntarily sign up to be foster families or sponsors with financial support) to locate and contact these children smoothly and interactively. Since we are working with highly private user data, all of our operations will be supervised by Ministry representatives who will keep an eye on volunteer/sponsor users. Although some similar systems currently exist in the software market, we believe that our product can take it one step further and bring a new perspective and alternative to the common understanding of charity software products.

2.3 The Reason for Starting This Project

We have carefully chosen this project for implementation in light of the devastating catastrophes that have recently struck TRCN and Türkiye. The region has been marred by numerous tragic events, including a destructive earthquake that inflicted significant damage upon communities, leaving countless individuals without homes, adequate food, and separated from their families. The magnitude of these disasters necessitates immediate action, and thus, we have resolved to undertake this project as a means to facilitate essential aid for the affected people, reaching out to the global community for support.

By embarking on this initiative, we aim not only to provide crucial assistance to those in need but also to collaborate with various non-profit organizations in TRCN and Türkiye. This partnership will strengthen their capacity to respond effectively to such emergencies, enabling them to act swiftly and efficiently in the face of future crises. By mobilizing resources, raising awareness, and coordinating relief efforts, our project will play a pivotal role in expediting the achievement of the nonprofit organization's national objectives.

Our ultimate goal is to foster a collective sense of solidarity, both within our local communities and on a global scale. By rallying support from individuals, corporations, and governments worldwide, we aspire to create a network of compassionate individuals and organizations committed to alleviating the suffering caused by these tragic events. Through joint efforts and a shared commitment to social responsibility, we believe that we can make a tangible difference in the lives of those affected by these calamities, offering them hope, stability, and a path towards rebuilding their lives.

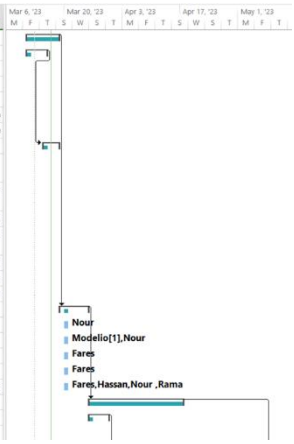
2.4 Output/Success Criteria

Output of project: At the end of the project, we will have a fully operational web-based charitable system. This would involve crucial features like viewing and selecting children, therefore volunteers would be able to provide help and communicate with the children. We expect that our system will be one of the most significant contrivances that contributes to minimizing the difficulties that vulnerable children are facing due to harsh life conditions. We will also obey the international standards and constraints: 2089-2021 - IEEE Standard for an Age-Appropriate Digital Services Framework Based on the 5 Rights Principles for Children

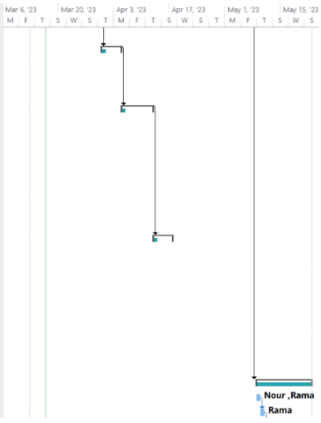
Success criteria: Usage: Our goal is to raise the number of users of our system. Since we are meeting the requirements of the people who want to help those children. Time: The project could take up to three months to be completed, so our target is to finish it on schedule. Budget: Costs of developing such a system are relatively high, but we aim to override them by increasing the number of users of the system.

2.5 Gantt Chart

Text1	Task Name	Duration	Start	Finish	Prec	Resource Names
WP1:	**Project Feasibility and Pre-Research**	**1 wk**	**Sat 3/11/23**	**Sat 3/18/23**		
1.1	**Project Process and Economic Feasibility**	4 days	Sat 3/11/23	Wed 3/15/23		
1.1.1	* Project Initiation					Fares
1.1.2	* Analysis of similar products					Fares
1.1.3	* Identification of the requirements and cost analysis					Rama
1.1.4	*Analysis of Workflow					Fares,MS project[1],Rama
1.1.5	*Constructing the work breakdown					Fares,MS project[1],Rama
1.2	**Technological Feasibility**	4 days	Wed 3/15/23	Sat 3/18/23	2	
1.2.1	* Output technical and technological requirements analysis					Rama
1.2.2	* Determine the technological resources will be needed in the project					Fares,Hassan,Nour ,Rama
1.2.3	* Literature and patent research					Fares,Hassan,Nour ,Rama
1.2.4	* Examination of similar national and international projects made by applied technology					Fares,Hassan,Nour ,Rama
1.2.5	* Conceptual design					Fares,Hassan,Nour ,Rama
1.2.6	* Potential research approaches and methods					Fares,Hassan,Nour ,Rama
1.2.7	* Software requirements analysis					Fares,Hassan,Nour ,Rama
WP2:	**Based System Design Technology**	**1 wk**	**Sun 3/19/23**	**Sat 3/25/23**	1	
2.1	Determining the System Parameters	1 day	Mon 3/20/23	Mon 3/20/23		Nour
2.2	Design of System	1 day	Mon 3/20/23	Mon 3/20/23		Modelio[1],Nour
2.3	Selection of the device to be used	1 day	Mon 3/20/23	Mon 3/20/23		Fares
2.4	Material and Supplier Selection	1 day	Mon 3/20/23	Mon 3/20/23		Fares
2.5	Evaluation of System Design and Revisions	1 day	Mon 3/20/23	Mon 3/20/23		Fares,Hassan,Nour ,Rama
WP3:	**Development of System Software**	**17 days**	**Sun 3/26/23**	**Mon 4/17/23**	16	
3.1	**Concept Development and Needs Analysis**	5 days	Sun 3/26/23	Thu 3/30/23		
3.1.1	* System requirements / needs analysis					Rama



Text1	Task Name	Duration	Start	Finish	Prec	Resource Names
3.1.2	* Solution and research or technical models to determine					Rama
3.2	**Creating a Database**	3 days	Fri 3/31/23	Tue 4/4/23	23	
3.2.1	* Classification and associated to the Database					Hassan,Oracle [1]
3.2.2	* Development of Inquiry module (Queries)					Hassan,Oracle [1]
3.2.3	* Accuracy optimization studies					Hassan
3.3	**Software development**	6 days	Wed 4/5/23	Wed 4/12/23	26	
3.3.1	* Establishment of the structure and the establishment of the necessary server software					Fares,Hassan
3.3.2	* Algorithm Modeling					Hassan
3.3.3	* Create a System programming language for Web services					Hassan,Nour
3.3.4	* The creation of the database connection module between Web services					Hassan,Rama
3.3.5	* User Interface Design and Programming					Nour
3.3.6	* Creating User Reports received by the Information					Fares
3.4	**Software Integration**	3 days	Thu 4/13/23	Mon 4/17/23	30	
3.4.1	* User interface, the creation of links between Web services and database module					Hassan,Nour
3.4.2	* User interface testing					Rama
3.4.3	* Establishment of the structure and the establishment of the necessary server software					Fares
3.4.4	* The data can be saved to disk and processing database					Fares
3.4.5	* Security and performance optimization					Fares,Rama
3.4.6	* The creation of user reports					Rama
3.4.7	* System Testing and Required Revisions					Rama
WP4:	**Prototype Implementation and Test Study**	**11 days**	**Tue 5/9/23**	**Mon 5/22/23**	22	
4.1	Interface Tests	1 day	Tue 5/9/23	Tue 5/9/23		Nour ,Rama
4.2	Website testing	1 day	Wed 5/10/23	Wed 5/10/23	46	Rama



Text1	Task Name	Duration	Start	Finish	Prec	Resource Names
4.3	Testing of database and application server	2 days	Thu 5/11/23	Fri 5/12/23	47	Hassan,Oracle [1]
4.4	Testing on real users of the system	1 day	Mon 5/15/23	Mon 5/15/23	48	Fares,Rama
4.5	Test Results Analysis and System Evaluation	2 days	Tue 5/16/23	Wed 5/17/23	49	Fares,Hassan,Nour ,Rama
4.6	Establishing Standards Certification	2 days	Thu 5/18/23	Fri 5/19/23	50	Fares
4.7	Completion of Improvements	1 day	Sat 5/20/23	Sat 5/20/23	51	Fares,Hassan,Nour ,Rama
4.8	Project Closure	1 day	Mon 5/22/23	Mon 5/22/23	52	Fares

2.6 Project Package Tables

Work Package No	1
Work Package Name	**Project Feasibility and Pre-Research (Feasibility Analysis)**
Start-End Date and Time	11.3.2023 -> 18.3.2023
Related Organizations	

1- List the activities of work packages.

1.1 Project Process and Economic Feasibility:

- Project initiation
- Analysis of similar systems
- Identification of the requirements and cost analysis
- Analysis workflow
- Determine Scope of System
- Define Resources (Preliminary)

1.2 Technological Feasibility:

- Output technical and technological requirements analysis
- Determining technological resources
- Literature and patent research
- Examination of similar national and international projects made by applied technology.
- Conceptual design
- Potential research approaches and methods
- Software requirements analysis

2- Describe the methods and parameters that will be used for work package.

Thorough research on similar systems shall be conducted in order to achieve a fully functioning voluntary system. We shall interview the possible stakeholders and end users of our system in order to meet their expectations and to develop a well-functioning system. A Gantt chart will be used.

3- List the experiments, tests, and analysis in the work package.

- Online research
- Research and analysis of similar systems
- Budget and Cost Management
- Validation / customer testing
- Expense estimation
- Risk estimations.
- Interview stakeholders
- Create requirements document.
- Define and allocate resources.

4- List the output of work package and its success criteria.

Outputs:

- Establishing the distribution of tasks.
- Understanding the general idea of the project.
- Having an idea about similar projects and systems.
- Estimation on profits and costs
- As we analyze the similarities of other systems, the reuse rate in the system may increase.
- Complete economic and technological feasibility study
- Initial Requirements Specification Document (SRS), feasibility analysis, secured resources.

Success Criteria's:

- Making team members familiar with the project.
- Having an idea about the overall view of the system and concepts.
- Better understanding of the required requirements.
- Deciding if the project is profitable or not.
- Understanding the possible risks that may occur in the system.
- Better grasp on the timeline, time constraints and budget constraints

5- Explain the relation of output with other work packages

This work package is the basic step to perform other work packages as the others will be developed according to this one. It will give an estimation on whether the project will succeed if certain steps are performed.

Table 1: Work Package 1

Work Package No	2
Work Package Name	**Based System Design Technology (Analysis & Design stage)**
Start-End Date and Time	19.3.2023 -> 25.3.2023
Related Organizations	

1- List the activities of work packages.

- Define stakeholders for the system.
- Determine necessary requirements for the system and develop SRS document.
- Determining resources needed for the system.
- Defining the relations between stakeholders
- Drawing necessary diagrams to make implementation clearer.
- Modeling and Prototyping
- Hardware Study
- System Evaluation
- System Design
- Data Flow Definitions

2- Describe the methods and parameters that will be used for work package.

- Application of UML Modeling techniques
- Figuring out system architecture with this work package
- Research about the most useful methodologies for project
- Prototype Methodology

3- List the experiments, tests, and analysis in the work package.

- Create overview of general flow of the system for better designing
- Gathering more design ideas
- Prototyping
- Preliminary stage of overall system design and development.
- Description of interdependence of system functions and capabilities.

4- List the output of work package and its success criteria's.

Outputs:

- Compatible requirements report.
- Some design samples of the system
- Detailed models which show the overall flow of the system
- Project structure

Success Criteria's:

- Understanding system structure and scope
- Coming up with solutions to the possible risks of the system
- An improvement of the SRS Document.
- Convenient models and methodologies.
- completion of system design.

5- Explain the relation of output with other work packages

System design and analysis is the most crucial part of the project. The requirements that resulted after this phase will be used in later phases which are coding, testing and maintenance. Therefore, the requirement document should be clear, well-defined, detailed and should comprise complete explanation of the project.

Table 2: Work Package 2

Work Package No	3
Work Package Name	**Development of System Software (Development Stage)**
Start-End Date and Time	26.3.2023 -> 17.4.2023
Related Organizations	

1- List the activities of work packages.

- User Interface Design
- Database Development
- Develop Algorithms and Coding
- Implement System Functions/Functionalities

2- Describe the methods and parameters that will be used for work package.

- Creating relational database with ER and different context diagrams
- We would use:
    - HTML (Hyper Text Mark-up Language) for the system structure (frontend)
    - CSS (Cascade Style Sheet) for the system styling (frontend)
    - Python (backend)

3- List the experiments, tests, and analysis in the work package.
• Checking compatibility of requirements • Checking function ability of the system • Identify modular design parameters. • Develop Code and Database • Developer testing (primary debugging)
4- List the output of work package and its success criteria's.
Outputs: • Ready and functional sample of system • Available for testing the system. **Success Criteria's:** • Low error rate in coding procedures. • Effective database design and implementation. • Well designed and friendly user interface
5- Explain the relation of output with other work packages
At the end of this work package, we will have a functional prototype of the system and the user interface which represents all requirements. After this work packages we will be ready to perform various tests to the system to see if there is any error or mistakes. It will be used as input to the testing team. It will also use the design and requirements packages as input to gather the required functionalities in a correct and complete form.

Table 3: Work Package 3

Work Package No	4
Work Package Name	**Prototype Implementation and Test Study and Maintenance (Test & Maintenance stage)**
Start-End Date and Time	9.5.2023 -> 6.6.2023
Related Organizations	

1- List the activities of work packages.

- Security testing
- Functional Testing
- Non-Functional Testing
- User Acceptance Testing
- Interface Testing
- Compatibility Testing
- Testing of database and application server
- Testing on real users of the system
- Establishing standards certification
- Completion of improvements
- Project closure

2- Describe the methods and parameters that will be used for work package.

- Black-box and white-box tests
- User acceptance testing for requirements.
- Performance tests
- Usability tests
- Unit and Integration tests
- System (Validation) Tests
- Web Load tests
- Color-harmony tests
- Html/CSS validation tests
- JavaScript validation tests
- Maintenance tests

3- List the experiments, tests and analysis in the work package.

- Test cases
- Test scenarios
- Applying test methods according to the type of the tests (unit, integration, system).
- Testing of Database and Application

4- List the output of work package and its success criteria.

Outputs:

- Results and reports of the tests
- Error reports
- Release testing document (including test cases and scenarios)
- Ready to release project.

Success Criteria's:

- A fully functional test suite.
- The application is complete and ready to use.

5- Explain the relation of output with other work packages
This is the last work package. So, if this work package's steps are perfectly completed, our project will be done and ready to be released.

Table 4: Work Package 4

2.7 List of Milestones

	Description of Output	**Expected Time Interval**
1	Project Feasibility and Pre-Research (Feasibility Analysis).	11.3.2023 → 18.3.2023
2	Based System Design Technology (Analysis and Design Stage).	19.3.2023 → 25.3.2023
3	Development of System Software (Development Stage).	26.3.2023 →17.4.2023
4	Prototype Implementation and Test Study and Maintenance (Test and Maintenance Stage).	9.5.2023 → 6.6.2023

Table 5: List of Milestones

2.8 List of Risks

Risk	Probability	Effects	Your Strategy
The time required to develop the software is underestimated.	High	Serious	If deadlines can't be met, it's vital to inform the client about it as soon as possible. A good way to tackle it is to split a bigger task into a couple of smaller ones. It's better to deliver a few smaller tasks than nothing at all.
Software tools cannot work together in an integrated way.	High	Tolerable	Choose integration software that allows you to maintain or change easily.
Customers fail to understand the impact of requirements changes.	Moderate	Tolerable	Share updates and information concerning problems being faced and reason for requirement changes
The rate of defect repair is underestimated.	Moderate	Tolerable	Replace potentially defective components with more reliable bought-in components.
The size of the software is underestimated.	High	Serious	Investigate buying SW components. Investigate use of a program generator.
Code generated by code generation tools is inefficient.	Moderate	Insignific ant	Rewrite code with more efficient generation tools
Key staff are ill at critical times in the project.	Moderate	Serious	Reorganize team so that there is more overlap of work and people therefore understand each other's jobs.
The database used in the system cannot process as many transactions per second as expected.	Moderate	Serious	Investigate the possibility of buying a higher-performance database.
Lack of product information and some significant requirements	Moderate	Serious	Include the identified important missing requirements to the software document in the next iteration of Agile.
No ministry to supervise the project.	High	Serious	Postpend the project till a supervise ministry is found.

Table 6: List of Risks

2.9 Commercialization Potential

Nowadays many projects are aimed to be profitable, and many industries use different techniques such as NPC to guide decisions on whether to pursue commercialization of a new technology to achieve that purpose, however our project is not aiming to be profitable, the project focusses on helping the orphans and vulnerable children with poor families, therefore the same strategies can be applied to the project but the goal for commercialization the project is to get well-known across the world thus target/potential people will get the help as soon as possible for variety of doners, legal organizations, and official ministries. If this project is to be commercialized, this may result in growing the project larger and to be translated into different languages and server people in the world. The risks that may arise from the commercialization of this project is trust issues which doners may not be easy to trust this app to deliver help they expect, difficulty to find deserved people for the help provided which is not always obvious to be distinguished.

2.10 Project Economic Expectation

List your expectations to your team which are come by your project	
Time-to-market (month):	May 2023
The expected increase in sales revenue (%):	-
The expected increase in market share (%):	-
Time to start to gain:	-

2.11 Instrument / Equipment / Software / Release Purchases

Project Name				Rays of Hope						
Line no	Instrument / Equipment / Software / Publication Name	No. of Item	Capacity	Technical specification	Purpose of Project Activities	Post-Project Place of Use / Purpose		Unit Price (USD)	Unit Price (TL)	Total Amount (TL)
						R & D	Production			
1	Laptop	4		512gb minimum with 100gb unused space and Core i5/i7 quad-core 2.2GHz or faster	Involved in every task of the project	YES	YES	850	15,810	-63,240
2	Internet connection	1		Min.15Mbps	Connection	YES	YES	56.6	1050	1050
3	MS Project	1		Project Management Software	Planning	YES		10	186	186
4	Office 365	1		Collection of office-related applications	MANAGEMENT	YES		6.99	390.042	390
5	Modelio	4		Tool for drawing diagrams	UML Diagrams	YES		-	-	-
6	MySQL	1		Tool for creating database	Database Operations	YES				
7	HTML	1		Language for developing the website front-end	Coding Purposes	YES		-	-	-
8	CSS	1		Language for developing the website front-end	Coding Purposes	YES		-	-	-
9	VS Code			Tool for writing code		YES		-	-	-
									TOTAL	64,866TL

Table 7: Instrument / Equipment / Software / Release Purchases

2.12 Quarterly Estimated Cost Form

Project Name: Empowerment for orphans				
Cost Item	2023		TOTAL (TL)	TOTAL COST RATE OF CONTENTS (%)
	I	II		
Personnel	20,000	20,000	40,000	30
Travel	1,000	1,000	2,000	10
Instrument / Equipment / Software / Publications	5,000	5,000	10,000	30
Domestic Works Made By R & D and Testing Institutions	0	0	0	0
International Works Made By R & D and Testing Institutions	0	0	0	0
Domestic Services Procurement	0	0	0	0
Overseas Service Procurement	0	0	0	0
Material	15,000	15,000	30,000	20
TOTAL COST	41,000	41,000	82,000	90
CUMULATIVE COST				90
IN THE PROJECT TOTAL MAN-MONTH				911

Table 8: Quarterly Estimated Cost Form

2.13 Pert Analysing & Crashing Analysing

Task ID	Task Name	Duration (days)	Dependency
A	Team Development/Scheduling	1	
B	Project Initialization/ Feasibility Studies	7	A
C	Requirements Analysis and Development	10	A, B
D	Resources Procurement/Allocation	5	B, C
E	Development of System Model(s)	5	C, D
F	Design UML diagrams	7	C,E
G	UI and Database Development	7	E,F
H	Prototyping and Design Synthesis	5	E, F
I	Coding and Implementation of Functionalities	30	E, F, G, H
J	Testing Activities and Modifications	7	I
K	Project Closure	1	I, J

Table 9: Pert Analysis Tasks

PERT Data			
Critical Path Tasks	**Optimistic**	**Most Likely**	**Pessimistic**
Team Development/Scheduling	1	1	1
Project Initialization/ Feasibility Studies	5	7	9
Requirements Analysis and Development	8	10	12
Resources Procurement/Allocation	4	5	6
Development of System Model(s)	4	5	6
Design UML diagrams	5	7	9
UI and Database Development	5	7	9
Prototyping and Design Synthesis	4	5	6
Coding and Implementation of Functionalities	25	30	35
Testing Activities and Modifications	5	7	9
Project Closure	1	1	1
Number of Critical Tasks: 11			

Desired Completion Time: 90

Critical Path Tasks	PERT Expected Time	Std. Dev.	Variance
Team Development/Scheduling	1.000	0.000	0.000
Project Initialization/ Feasibility Studies	7.000	0.667	0.444
Requirements Analysis and Development	10.000	0.667	0.444
Resources Procurement/Allocation	5.000	0.333	0.111
Development of System Model(s)	5.000	0.333	0.111
Design UML diagrams	7.000	0.667	0.444
UI and Database Development	7.000	0.667	0.444
Prototyping and Design Synthesis	5.000	0.333	0.111
Coding and Implementation of Functionalities	30.000	1.667	2.778
Testing Activities and Modifications	7.000	0.667	0.444
Project Closure	1.000	0.000	0.000
	Σte = 85.000		**ΣV = 5.333**

$Z = (90 - 85.000) / 5.333^{0.5} = 2.165$

Probability of Completion: 98.481%

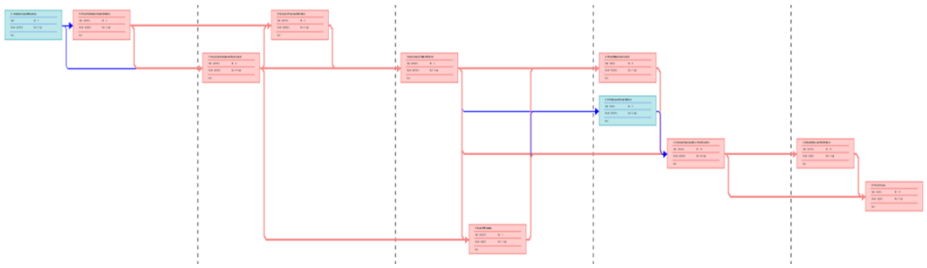


Figure 1: Network Diagram 1

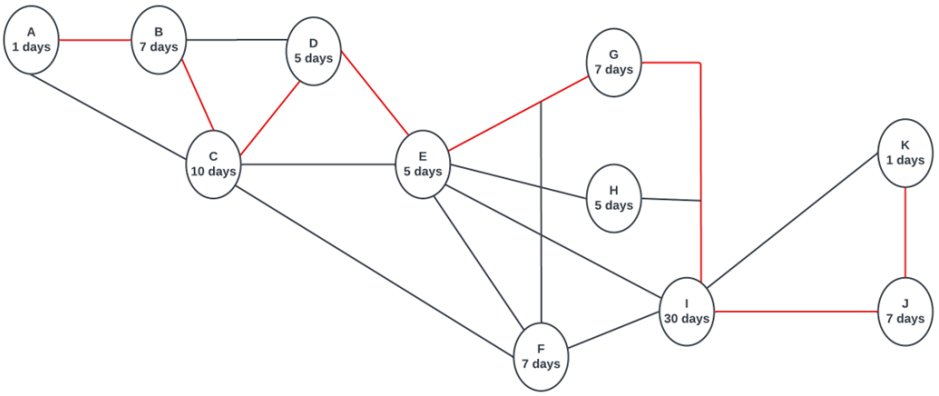


Figure 2: Network Diagram 2

#	Paths	Duration of each path	Variance	Std. variation
1	ABDEGIJK	1+7+5+5+7+30+7+1=**63**	0+0.444+0.111+0.111+0.444 +2.778+0.444+0= **4.332**	Sqrt(4.332) = **2.081**
2	**A B C D E G I J K**	**73**	**4.769**	**2.183**
3	ACDEGIJK	66	4.332	2.081
4	ABCEGIJK	68	4.665	2.159
5	ABCEIJK	61	4.221	2.0545
6	ABCEHIJK	66	4.332	2.081
7	ABCEHIK	59	3.888	1.971
8	ABCEIK	54	3.777	1.943
9	ACFEGIJK	68	4.665	2.1598
10	ACFEIJK	61	4.221	2.0545
11	ACFEHIJK	66	4.332	2.0813
12	ACFEHIK	59	3.888	1.971
13	ACFIJK	59	3.666	1.914
14	ACFIK	49	3.666	1.914
15	ACEGIJK	61	4.221	2.0545
16	ACEGIK	54	3.777	1.943
17	ACEIK	47	3.333	1.8256

18	ACEIJK	54	3.777	1.9434
19	ACEHIJK	59	3.888	1.9718
20	ACEHIK	52	3.444	1.8558
21	ABCDEIJK	66	4.328	2.0803
22	ABCDEIJK	59	4.332	2.0813
23	ABCDEIK	59	3.888	1.9718
24	ABCDEIJK	66	4.332	2.0813
25	ABCDEHIJK	71	4.443	2.107
26	ABCDEHIK	64	3.999	1.999
27	ABDEGIJK	63	4.332	2.0813
28	ABDEGIJK	56	4.332	2.0813
29	ABDEGIK	56	3.888	1.971
30	ABDEIJK	56	3.888	1.917
31	ABDEHIK	54	3.555	1.885
32	ABDEHIJK	61	3.999	1.999

Table 10: CPM

Analysis By Using PERT (Defining Paths)

The path with **bold** font and red color is our critical path having 73 days. The calculation of the critical path is shown, other paths are calculated in the similar way by checking the table values in PERT Calculation Section.

PERT CALCULATIONS

- Expected duration for each task is calculated by using the formula:

$$t = \frac{o + 4m + p}{6}$$

- Variance for each task is calculated by using the formula:

$$\sigma^2 = \left(\frac{p - o}{6}\right)^2$$

- Standard deviation for each task is calculated by taking the square root of variance.
- Variance for each path was calculated by adding all tasks variances.
- Standard deviation for each path was calculated by adding all tasks standard deviations.

COCOMO

Our project is Basic Organic mode.

Step 1: Calculate Unadjusted function point UFP.

Business Functions	Simple	Simple Weight	Average	Average Weight	Complex	Complex Weight	UFPs
User Input Functions (IT)	2	3	4	4	6	6	58
User Output Functions (OT)	3	4	5	5	7	7	86
User Inquiries (QT)	4	3	6	4	8	6	84
Internal Files (FT)	5	7	7	10	9	15	240
External Interfaces (ET)	6	5	8	7	10	10	186
						UFP=?	654

Step 2: Calculate DI.

Note: 0: No influence, 1: Incidental, 2: Moderate, 3: Average, 4: Significant, 5: Essential

Factors	Complexity	Complexity Value
Data Communication	Essential	5
Distributed data processing	Significant	4
Performance Criteria	Essential	5
Online Data Entry	Significant	4

Reusability	Significant	4
Ease of Installation	Essential	5
Maintainability	Essential	5
Online Updating	Essential	5
Complex Calculations	Moderate	2
Ease of operation	Significant	4
Portability	Essential	5
Maintainability	Significant	4
		DI = 52

Step 3: Calculate function point FP= UFP*[0.65+0.01*DI]

654 *[0.65+0.01*52] = 765.18

Step 4: Calculate KLOC for Python (we used Perl language ratio)

KLOC=FP*LANGUAGE RATIO

765.18 * 27 = 20659.86/1000 = 20.65

Step 5: Calculate effort.

E= 2.4 (20.65) ^1.05 = 57.66 p/m

Step 7: Calculate Deployment time.

D= 2.5 (57.66) ^0.38 = 11.67 month

Step 8: Calculate Staff size.

SS= 57.66 / 11.67 = 4.94 ~ 5 people

Step 9: Calculate Productivity

P= 20.65 / 57.66 = 0.358

The Basic COCOMO equations take the form:

$E = a_b (KLOC)^{bb}$
$D = c_b (E)^{db}$
SS = E/D persons
P = KLOC/E

E = effort
D = Deployment time
SS = staff size
P = productivity
a_b, b_b, c_b, d_b = Coefficients

Basic COCOMO Co- efficients

Project	a_b	b_b	c_b	d_b
Organic mode	2.4	1.05	2.5	0.38
Semidetached mode	3.0	1.12	2.5	0.35
Embedded mode	3.6	1.20	2.5	0.32

3. REQUIREMENTS ANALYSIS

3.1 Functional Requirements

This Raise of hope system is designed for the use of 3 actors:

• User (foster family, sponsor, donor)

• Admin

• Child

User Functional Requirements

USER:	
F.REQ -1	**The system shall allow the user to sign up.**
1.1	The system should ask the user to enter his First name.
1.2	The system should ask the user to enter his Last name.
1.3	The system should ask the user to enter his Email.
1.4	The system should ask the user to enter his Phone number.
1.5	The system should ask the user to enter his Password.
F.REQ -2	**The system shall allow the user to log in using his Email and password.**
F.REQ -3	**The system shall allow the user to view his profile.**
3.1	The system shall allow the user to view his personal information.
3.1.1	The system shall allow the user to view/edit his first/last name.
3.1.2	The system shall allow the user to view/edit his picture.
3.1.3	The system shall allow the user to view/edit his phone number.
3.1.4	The system shall allow the user to view his email address.
3.1.5	The system shall allow the user to view/edit his password.
3.2	The system shall allow the user to view his sponsorship history (if any).
3.2.1	The system shall allow the user to view active sponsorship subscriptions.
3.2.2	The system shall allow the user to view inactive sponsorship subscriptions.
3.3	The system shall allow the user to view his aid history (if any).
3.4	The system shall allow the user to view his total financial support amount (if any).

3.5	The system shall allow the user to view settings button.
3.5.1	The system shall allow the user to view/edit his notification preferences.
3.5.2	The system shall allow the user to edit the theme.
3.5.3	The system shall allow the user to change language.
3.6	The system shall allow the user to click on logout option.
F.REQ -4	**The system shall allow the user to view different modules.**
4.1	The system shall allow the user to view foster family module.
4.1.1	The system shall allow the user to fill in a form that is connected to foster family organization in TRNC. Constraints: -This module may contain legal regulations and processes. - Only users with an account can apply in the form.
4.2	The system shall allow the user to view sponsorship module.
4.2.1	The system shall allow the user to log in /sign up if he is not. Constraints: only users with an account can become a sponsor.
4.2.2	The system shall allow the user to view the meaning and the importance of sponsorship section.
4.2.3	The system shall allow the user to view sponsorship rules and regulations section.
4.2.4	The system shall allow the user to view different types of sponsorship subscriptions (monthly, yearly).
4.2.5	The system shall allow the user to select monthly contracted subscription option which is a fixed amount of fees (50 USD) contracted for 12 months.
4.2.6	The system shall allow the user to select one-time yearly subscription option which is a fixed amount of fees (550 USD).
4.2.7	The system shall allow the user to view a list of children and chooses one according to the subscription type he chooses.
4.2.8	The system shall allow the user to view his sponsorship subscription from his profile.
4.3	The system shall allow the user to view aids modules.
4.3.1	The system shall allow the user to select organizational financial support option.
4.3.1.1	The system shall allow the user to choose the desired amount he wants to donate from a specified option (25/ 50/ 75/ 100 USD).

4.3.2	The system shall allow the user to select specific child support option.
4.3.2.1	The system shall allow the user to view a list of children and chooses a child.
4.3.2.2	The system shall allow the user to choose the desired amount he wants to donate from a specified option (25/ 50/ 75/ 100 USD).
4.3.3	The system shall allow the user to select scholarship financial support option.
4.3.3.1	The system shall allow the user to choose the desired amount he wants to donate from a specified option (100/ 200/ 300/ 400/ 500 USD).
F.REQ -5	**The system shall allow the user to view his chats.**
F.REQ -6	**The system shall allow the user to send / receive messages to/from child.**
6.1	The system shall allow the user to call child
6.2	The system shall allow the user to chat with child
6.3	The system shall allow the user to video call child
6.4	The system shall allow the user to send voice messages to child.
6.5	The system shall allow the user to send photos to child.
6.6	The system shall allow the user to send gift to child by applying in a form with specific options of (Toys/stationary supplies/ clothes…etc).
F.REQ -7	**The system shall allow the user to view child profile page.**
7.1	The system shall allow the user to view child name.
7.2	The system shall allow the user to view child picture.
7.3	The system shall allow the user to view child age.
7.4	The system shall allow the user to view child nationality.
7.5	The system shall allow the user to view child current location (time/weather).
7.6	The system shall allow the user to view child education status (successes/troubles).
7.7	The system shall allow the user to view child family status (orphan / poor /sustainable).
7.8	The system shall allow the user to view child story description about him.
7.9	The system shall allow the user to view child video.
7.10	The system shall allow the user to view child photo gallery.
7.11	The system shall allow the user to view child expenses status (food/ clothes/entertainment/money…etc).

7.12	The system shall allow the user to view child achievements.
F.REQ -8	**The system shall allow the user to view feedback messages.**
F.REQ -9	**The system shall allow the user to view home button.**
F.REQ -10	**The system shall allow the user to view chatbot option.**
F.REQ -11	**The system shall allow the user to view help button.**
11.1	The system shall allow the user to view contact us page.
11.2	The system shall allow the user to view About us page.
11.3	The system shall allow the user to view privacy policy page.
F.REQ -12	**The system shall allow the user to view an option to log out.**

Table 11: User Functional Requirements

Child Functional Requirements

CHILD:	
F.REQ -1	**The system shall allow the child to log in using his Email and password.**
F.REQ -2	**The system shall allow the child to view his profile.**
2.1	The system shall allow the child to view his name.
2.2	The system shall allow the child to view his picture.
2.3	The system shall allow the child to view his age.
2.4	The system shall allow the child to view his nationality.
2.5	The system shall allow the child to view his story description about himself.
2.6	The system shall allow the child to view his current location (time/weather).
2.7	The system shall allow the child to view his family status (orphan / poor /sustainable).
2.8	The system shall allow the child to view his expenses status (food/ clothes/entertainment/money…etc).
2.9	The system shall allow the child to view his education status (successes/troubles).
2.10	The system shall allow the child to view his video.

2.11	The system shall allow the child to view his photo gallery.
2.12	The system shall allow the child to view his achievements.
F.REQ -3	**The system shall allow the child to view his chats.**
F.REQ -4	**The system shall allow the child to receive messages from the user.**
4.1	The system shall allow the Child to receive call from user.
4.2	The system shall allow the child to receive chat from user.
4.3	The system shall allow the child to receive video calls from the user.
4.4	The system shall allow the child to receive voice messages from the user.
4.5	The system shall allow the child to receive photos from the user.
F.REQ -5	**The system shall allow the child to send messages to the user.**
5.1	The system shall allow the child to call user
5.2	The system shall allow the child to chat with user
5.3	The system shall allow the child to video call user
5.4	The system shall allow the child to send voice messages to user.
F.REQ -6	**The system shall allow the child to view feedback messages.**
F.REQ -7	**The system shall allow the child to view home button.**
F.REQ -8	**The system shall allow the child to view the sponsor profile.**
8.1	The system shall allow the child to view sponsor name.
8.2	The system shall allow the child to view sponsor picture.
8.3	The system shall allow the child to view sponsor email.
F.REQ -9	**The system shall allow the child to log out.**

Table 12: Child Functional Requirements

Admin Functional Requirements

ADMIN:	
F.REQ -1	**The system shall allow the admin to register a child by creating his account.**
3.1	The system shall allow the admin to enter child name.
3.2	The system shall allow the admin to put child picture.
3.3	The system shall allow the admin to enter child age.
3.4	The system shall allow the admin to enter child nationality.
3.5	The system shall allow the admin to write the child story.
3.6	The system shall allow the admin to specify the child's current location (time/weather).
3.7	The system shall allow the admin to enter Childs' family status (orphan / poor /sustainable).
3.8	The system shall allow the admin to enter child expenses status (food/ clothes/entertainment/money…etc).
3.9	The system shall allow the admin to enter child education status (successes/troubles).
3.10	The system shall allow the admin to put child video.
3.11	The system shall allow the admin to put child photo gallery.
3.12	The system shall allow the admin to write child achievements.
F.REQ -2	**The system shall allow the admin to remove child account**
F.REQ -3	**The system shall allow the admin to view children's profile.**
F.REQ -4	**The system shall allow the admin to edit children's profile.**
F.REQ -5	**The system shall allow the admin to view Fosters related information.**
F.REQ -6	**The system shall allow the admin to view Sponsors related information.**
F.REQ -7	**The system shall allow the admin to view Donators related information.**
F.REQ -8	**The system shall allow the admin to create modules.**
8.1	The system shall allow the admin to create " Foster Family " module.
8.1.1	The system shall allow the admin to create a form that is connected to foster family organization in TRNC.
8.2	The system shall allow the admin to create " Sponsor " module.

8.2.1	The system shall allow the admin to specify type of subscription monthly contracted subscription option which is a fixed amount of fees (50 USD) contracted for 12 months.
8.2.2	The system shall allow the admin to specify type of subscription one-time yearly subscription option which is a fixed amount of fees (550 USD).
8.3	The system shall allow the admin to create " Aid " module.
8.3.1	The system shall allow the admin to create organizational financial support option with specified donation amounts (25/ 50/ 75/ 100 USD).
8.3.2	The system shall allow the admin to create specific child support option with specified donation amounts (25/ 50/ 75/ 100 USD).
8.3.3	The system shall allow the admin to create scholarship financial support option with specified donation amounts (100/ 200/ 300/ 400/ 500 USD).
F.REQ -9	**The system shall allow the admin to manage donations.**
F.REQ -10	**The system shall allow the admin to organize communication schedule between children and helper.**
10.1	The system shall allow the admin to organize chatting schedule.
10.2	The system shall allow the admin to organize video call schedule.
F.REQ -11	**The system shall allow the admin to receive and approve gift request forms from users.**
Constraints	**Admin shall be responsible of the communication between the helper and the child(ren) which are below 12 years old.**

Table 13: Admin Functional Requirements

3.2 Non-Functional Requirements

Performance Requirements

Ensure that the system is able to provide efficient and effective support to users.

The most important aspect of website performance is the user experience, we will focus on creating a website that gives the user good experience by

- Choosing satisfying color for the page
- Make sure that all queries must return results within 10 seconds.
- Efficient response time. The execution time for all user interfaces use case should be around 5 seconds. Other performance requirements including memory, storage as well as processing must follow the industry recommended practices to ensure everything is working efficiently.

Safety Requirements

The purpose of safety requirements is to ensure that the system operates safely under different conditions and situations.

- The system should not cause any harm to end-users' hardware or software components.
- Users should not be exposed to any security risks or malware through the website.
- The system should not inflict any damage to other systems and software. It wouldn't cause any damage externally or internally to components. To achieve these aims, we are planning to use anti-virus software and run several testing methodologies using testing tools and perform these tests frequently.

Security Requirements

Security requirements are meant to ensure that the system is secure and protected against unauthorized access, data theft, and other security threats.

- Privacy& Cookies
- Hash function
- Encryption
- Strong password constancies: using password management to help user getting a strong, and unique password suggestions.
- ReCAPTCHA: enables web hosts to distinguish between human and automated access to websites. by giving some tasks like unclear letters and asking the user to write them. Where these kinds of tasks are easy for humans and difficult for bots.

Availability Requirements

The system should work 24 hours a day, 7 days a week. We will have a back-up plan for user data, monitor the network traffic and generate an alarm only if an error is detected. Plus, in case of system crash, user data should be retained.

Software Quality Attributes

By focusing on software quality attributes, developers can ensure that their software meets certain standards of quality and usability. and can provide a better user experience.

- **Testability**: This refers to how easily the system can be tested for defects and bugs. A testable system should have a clear and consistent architecture, with well-defined interfaces and testing procedures. We will test our website using different testing tools available such as post man and W3C for checking there is no broken links or missing tags in the HTML code.

- **Usability:** This refers to how easy it is to use the system and how well it meets the user's needs. A usable system should be intuitive and provide clear feedback to users. Our system will have user guide for making the website simple to use. The website of our system should be easy to use, taking into consideration that the majority of the users are not technically aware of software website structure.
- **Maintainability:** refers to how easy it is to make changes to the system and fix defects. A maintainable system should be modular and well-documented, with clear separation of concerns. Since our system is intended to scale up in the future, the website shall remove all the back-end complexities for in-house engineers to make changes to the system in the future
- **Compatibility:** the software system should be able to work effectively and correctly with other systems, software, hardware, and environments. It involves ensuring that the software can operate without conflicts, errors, or failures with different operating systems, hardware, browsers, other software, and internationalization factors. Our system's implementation will be responsive.

Business Rules

User (volunteer): An actor in the system who can interact and use different functionalities in specific sections.

Admin: An actor who organizes the system.

Child(ren): An actor who will interact with the system.

3.3 Realistic Constraints

- Users must be connected to the internet to use the system.
- Child must be 12 years old to use the system by their own.
- Users can’t sponsor children in bulk.
- Foster Family module may contain legal regulations and processes.
- Only users with an account can apply in the foster family form.
- Only users with an account can become a sponsor.
- Admin shall be responsible for the communication between the helper and the child(ren) which are below 12 years old.

3.4 Ethical Issues

Ethical issues arising from the use and maintenance of the system is highly unlikely to occur.

4. DESIGN

4.1 High Level Design (Architectural)

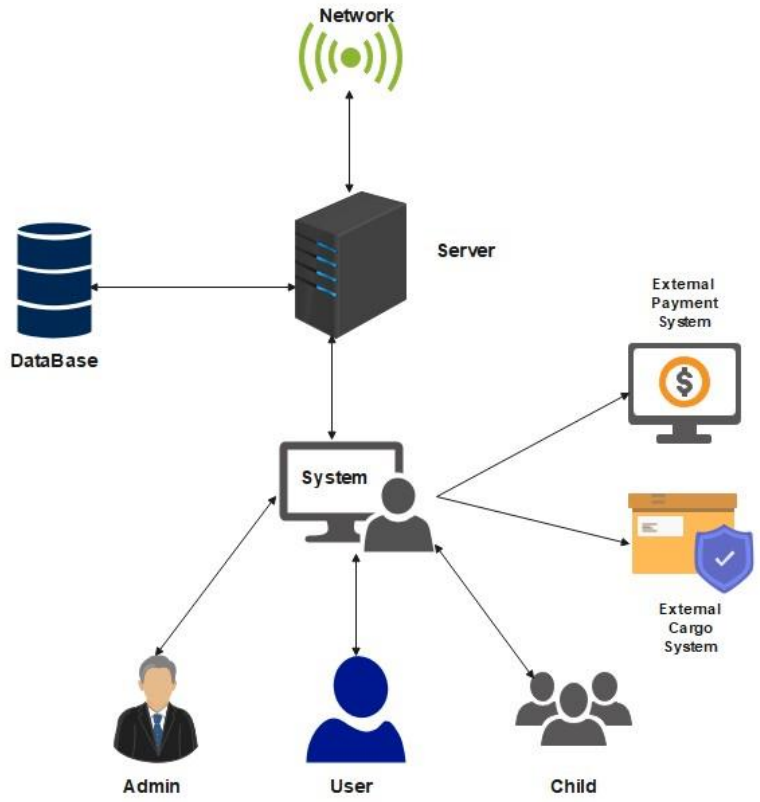


Figure 3: Architectural Diagram

4.2 Software design

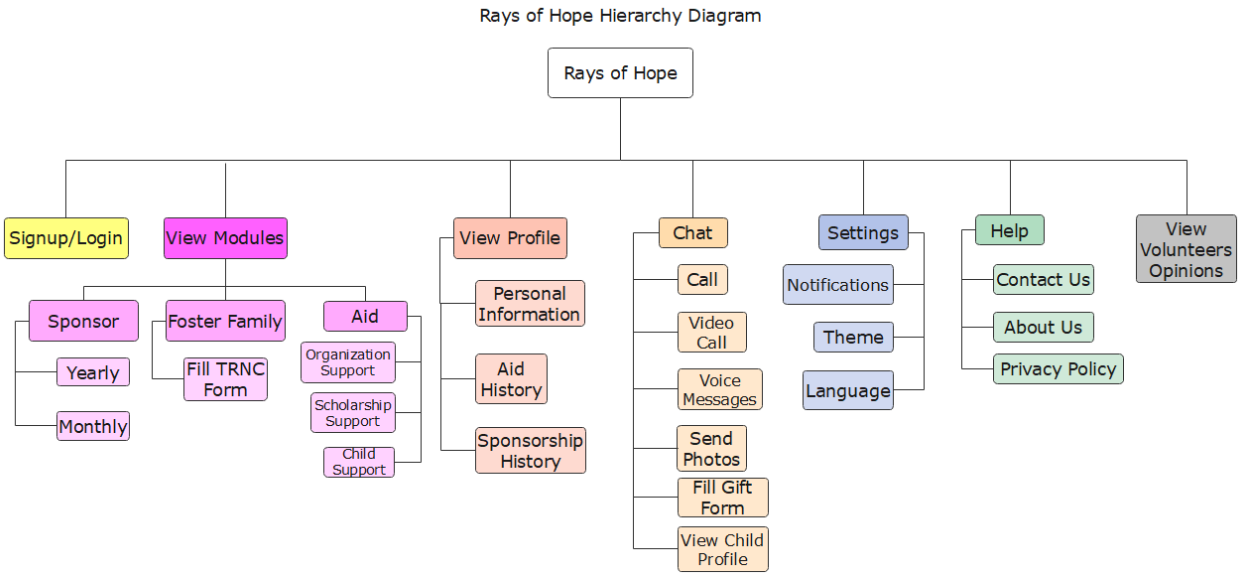


Figure 4: Modular Hierarchy Diagram

4.2.1 Use Case Diagrams and Tables

Admin Use Case Diagrams

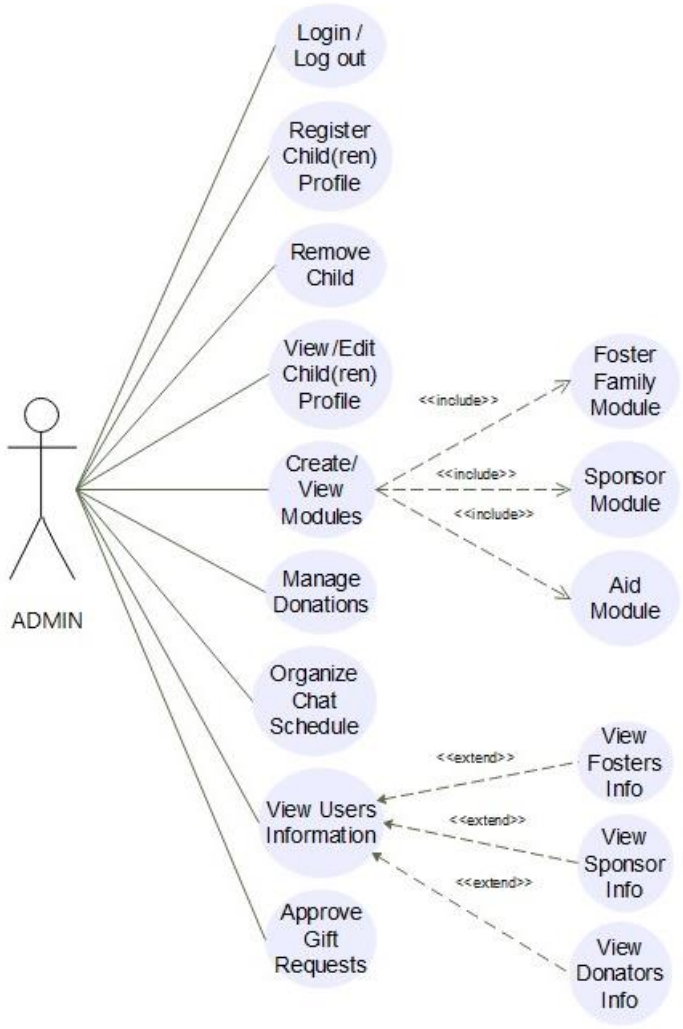


Figure 5: Admin Use Case Diagram

Child Use Case Diagrams

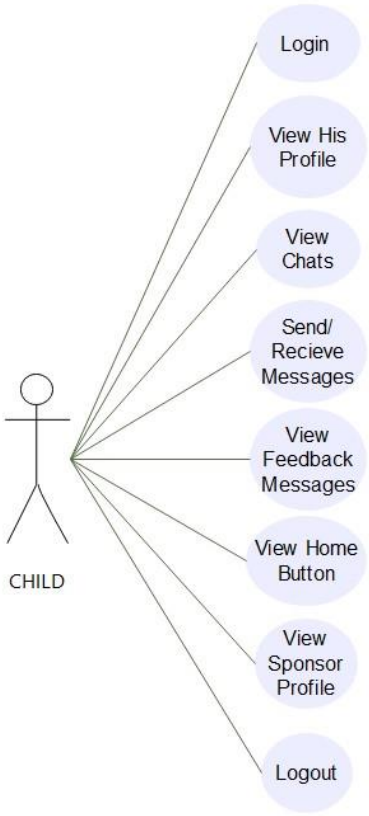


Figure 6: Child Use Case Diagram

User Use Case Diagrams

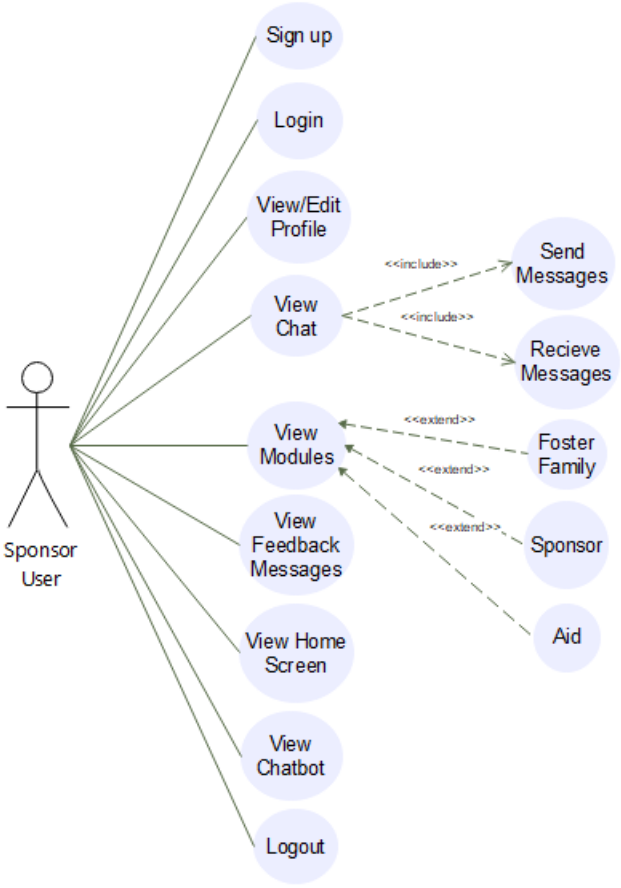


Figure 7: User Use Case Diagram

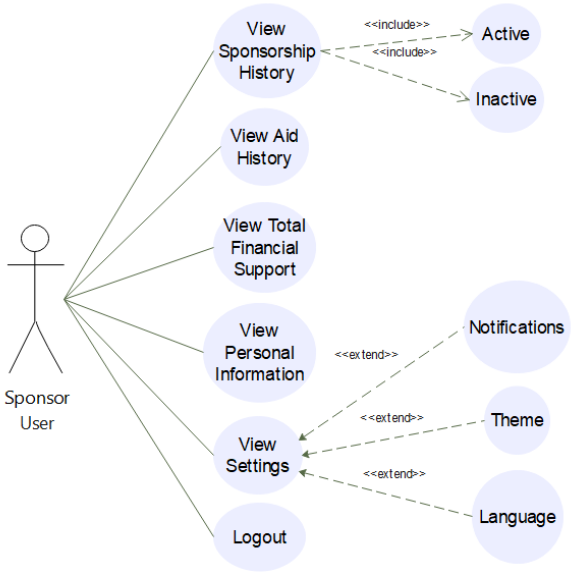


Figure 8: User View Profile Use Case Diagram

Use Case Tables

Use Case Title	View Modules
Primary Actor	User
Level	-
Stakeholder	Admin, User
Precondition	The user is connected to the internet and browsing the system.
Minimal Guarantee	Rollback of any uncompleted process
Success Guarantee	Modules is accessed by the user
Trigger	User access system homepage
Main Success Scenario	1. User views the homepage. 2. User selects the desired module. 3. If user selected sponsorship module 3.1 User will view a section about the meaning and the importance of sponsorship. 3.2 User will view sponsorship rules and regulations. 3.3 User will view different types of sponsorship subscriptions (monthly, yearly). 3.4 User can select monthly contracted subscription option which is a fixed amount of fees (50 USD) contracted for 12 months. 3.5 User can select one-time yearly subscription option which is a fixed amount of fees (550 USD). 3.6 User will see a list of children and chooses one according to the subscription type he chooses.

	3.7 User is redirected to payment page. 3.8 User will be able to view sponsorship subscription from his profile. 4. If user selected aid module 4.1 user will view different types of aid options. 4.2 user can select organizational financial support option. 4.2.1 user will choose the desired amount he wants to donate from a specified option (25/ 50/ 75/ 100 USD). 4.3 User can select specific child support option. 4.3.1 user will see a list of children and choose a child. 4.3.2 user will choose the desired amount he wants to donate from a specified option (25/ 50/ 75/ 100 USD). 4.4 User can select scholarship financial support option. 4.4.1user will choose the desired amount he wants to donate from a specified option (100/ 200/ 300/ 400/ 500 USD). 4.5 User will be redirected to payment page. 4.6User will be able to view aid history form his profile. 5. If user selected foster family module 5.1 User will fill in a form that is connected to foster family organization in TRNC. 6. User can return to the homepage
Extensions	1. The requested page does not load or cannot be found. 1.a user refresh page and it loads successfully. 1.b user refresh page and it does not load, leaves site. 2. The system does not return list of children 2.a user refresh page and list appear. 3. payment not successful 3.a process not successful, user will be directed to homepage

Table 14: Use Case Table 1

Use Case Title	Chats
Primary Actor	User
Level	-
Stakeholder	User, Child
Precondition	-The user is connected to the internet and browsing the system. -The user has an account. -The user is a sponsor for the child.
Minimal Guarantee	Latest chats will be saved in the database
Success Guarantee	Chats is done successfully
Trigger	User access his chats
Main Success Scenario	1.User access his chats from the menu in homepage 2.User chooses the child he wants to contact 3.User can send/receive messages 4.User can call child 5.User can video call child 6.User can send voice messages to child. 7.User can send photos to child. 8.User can send gift to child by applying in a form with specific options of (Toys/stationary supplies/ clothes…etc). 9.User can read the child's name and click on his picture which represents his profile page.
Extensions	2. The requested chat does not load or cannot be found. 1.a user refresh page and it loads successfully. 1.b user refresh page and it does not load, leaves site. 2. The user does not receive child chats 2.a user refresh page and chat appear. 3. messages, photos, call….etc are not successfully sent 3.a process not successful, user can refresh page

Table 15: Use Case Table 2

4.2.2 Sequence Diagrams

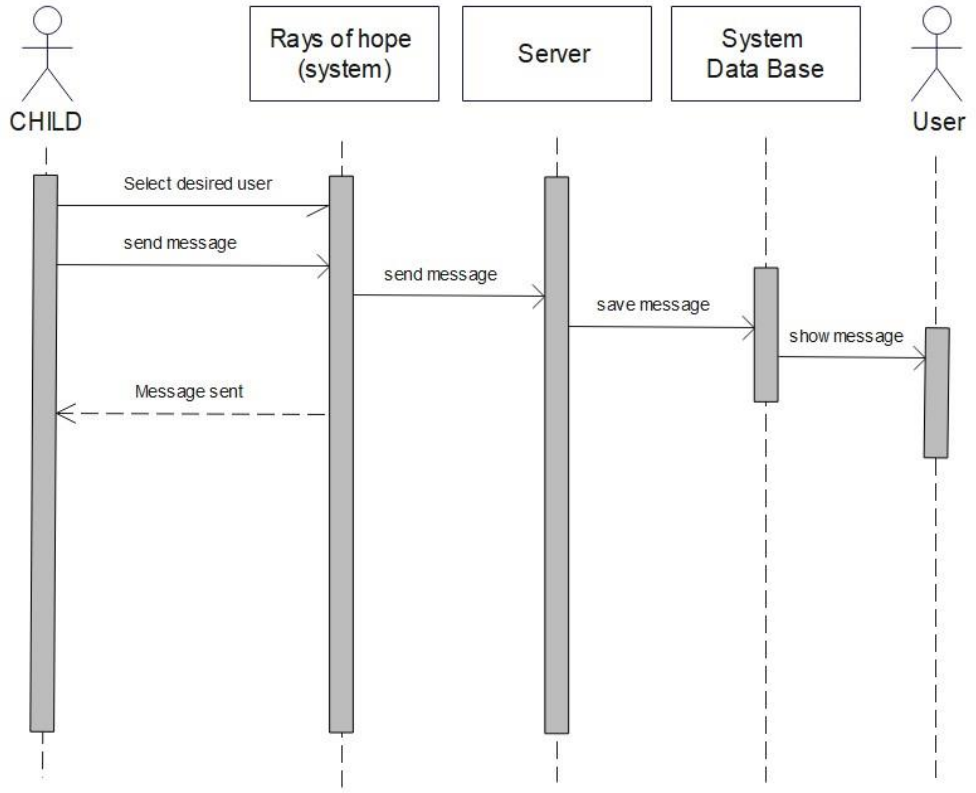


Figure 9: Child Chat Sequence Diagram

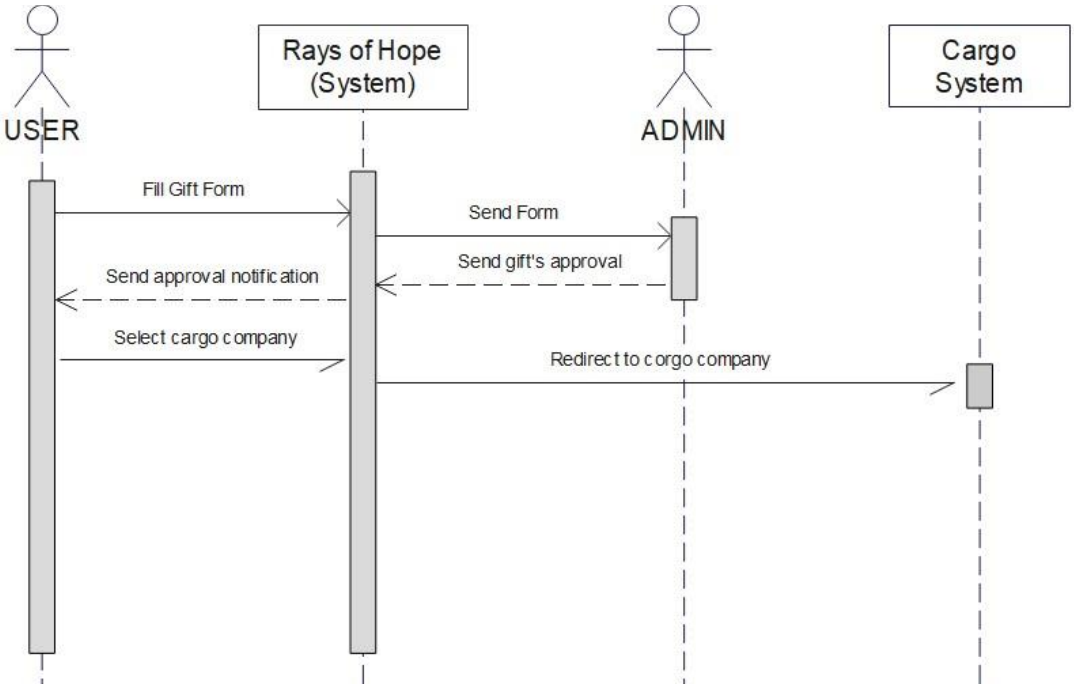


Figure 10: Fill Gift Form Sequence Diagram

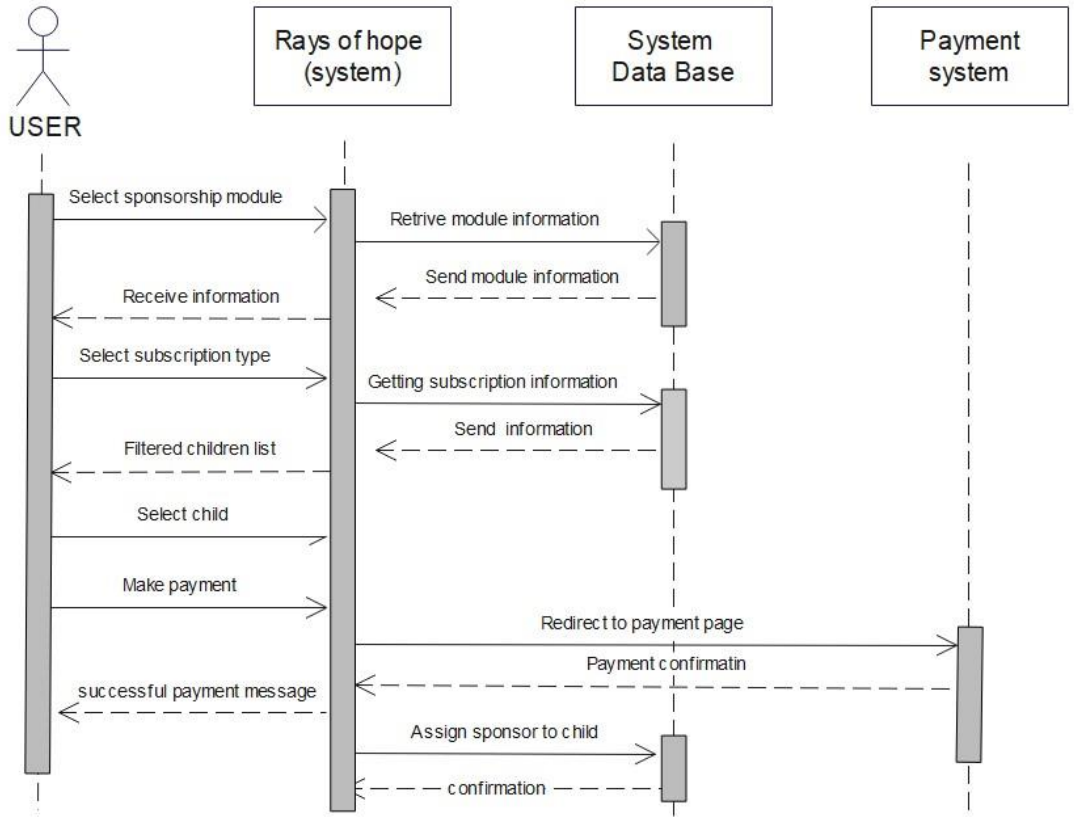


Figure 11: Match Child with Sponsor Sequence Diagram

4.2.3 Activity Diagrams

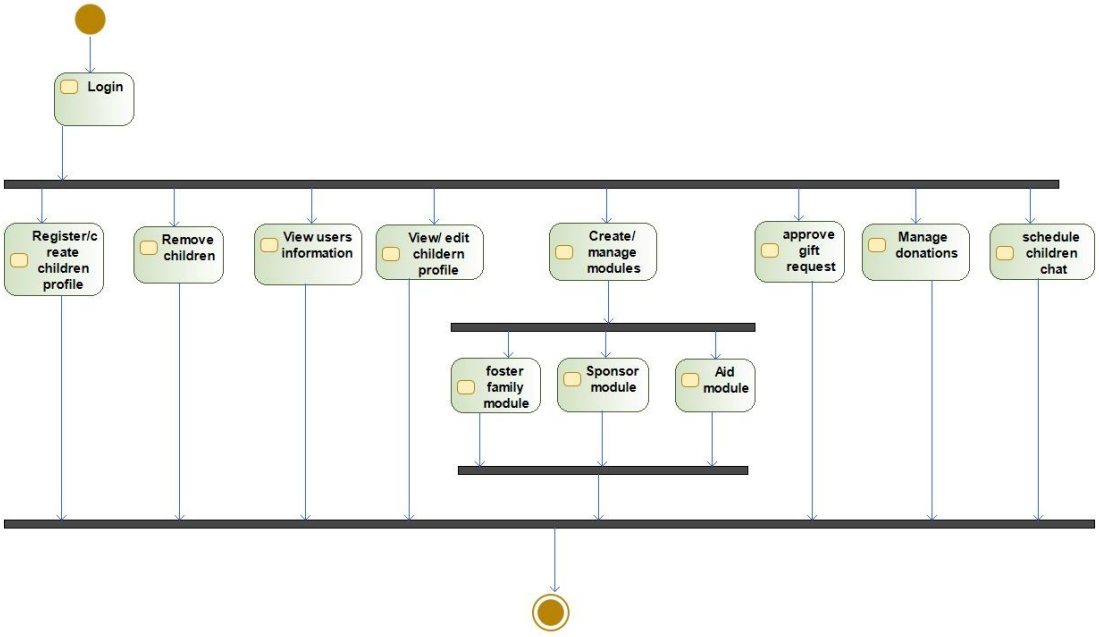


Figure 12: Admin Activity Diagram

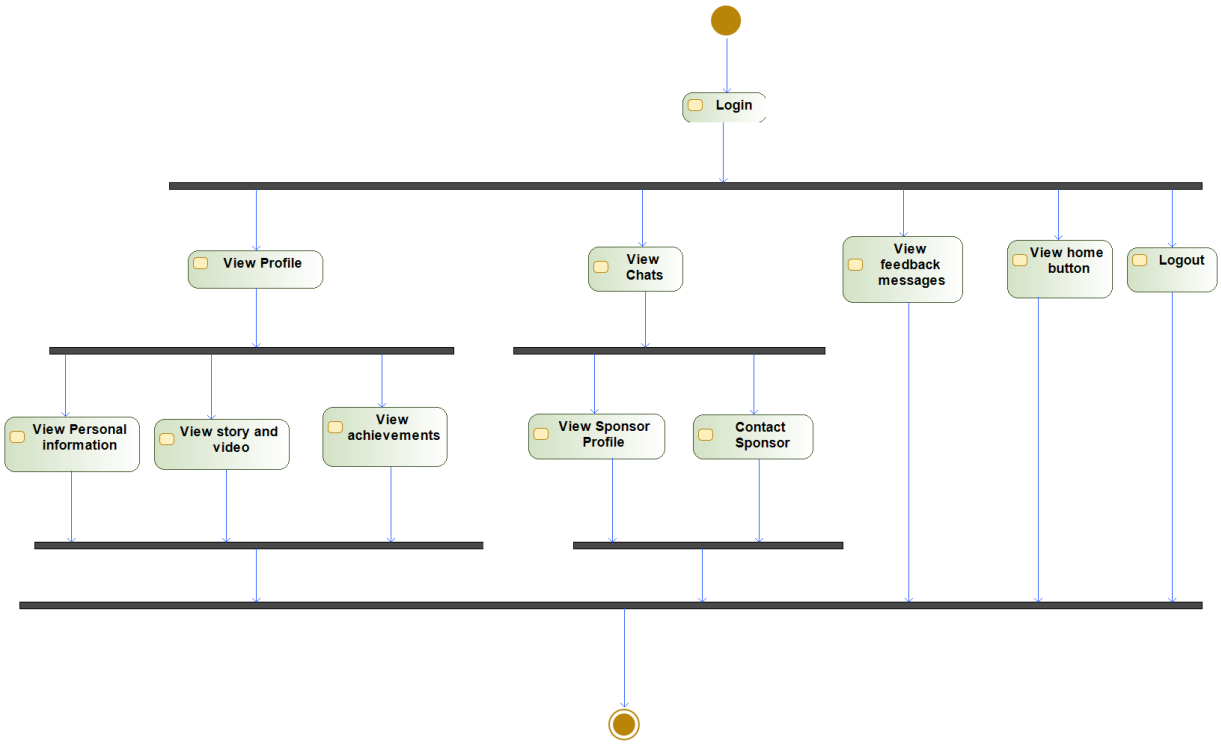


Figure 13: Child Activity Diagram

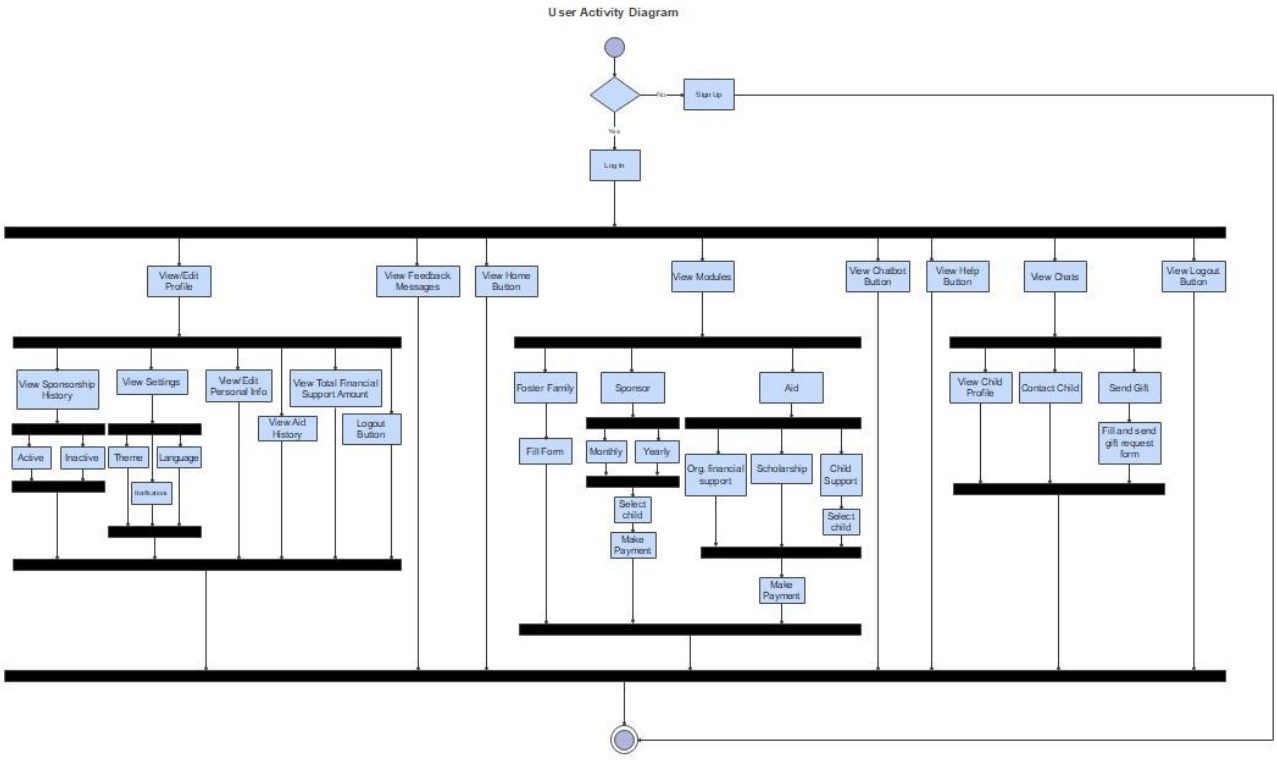


Figure 14: User Activity Diagram

4.2.4 BPMN Diagrams

This is the full BPMN diagram due to not clear elements each actor BPMN will be shown separately below.

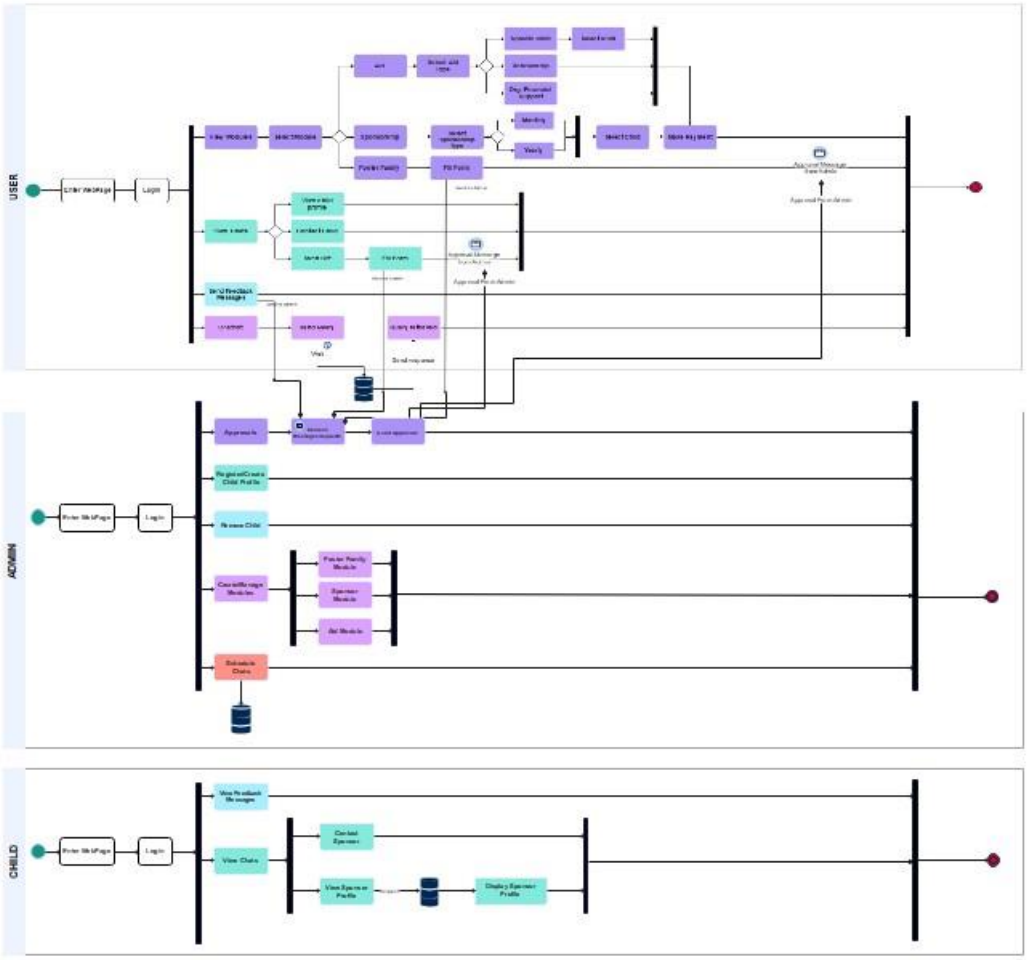


Figure 15: Full BPMN Diagram

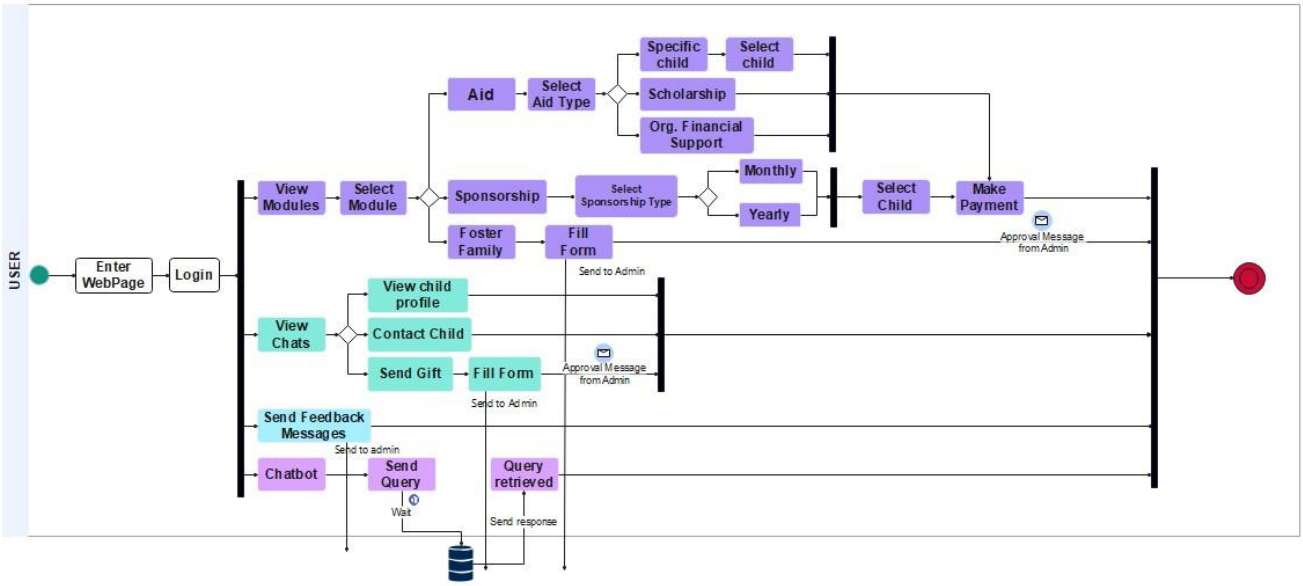


Figure 16: User BPMN Diagram

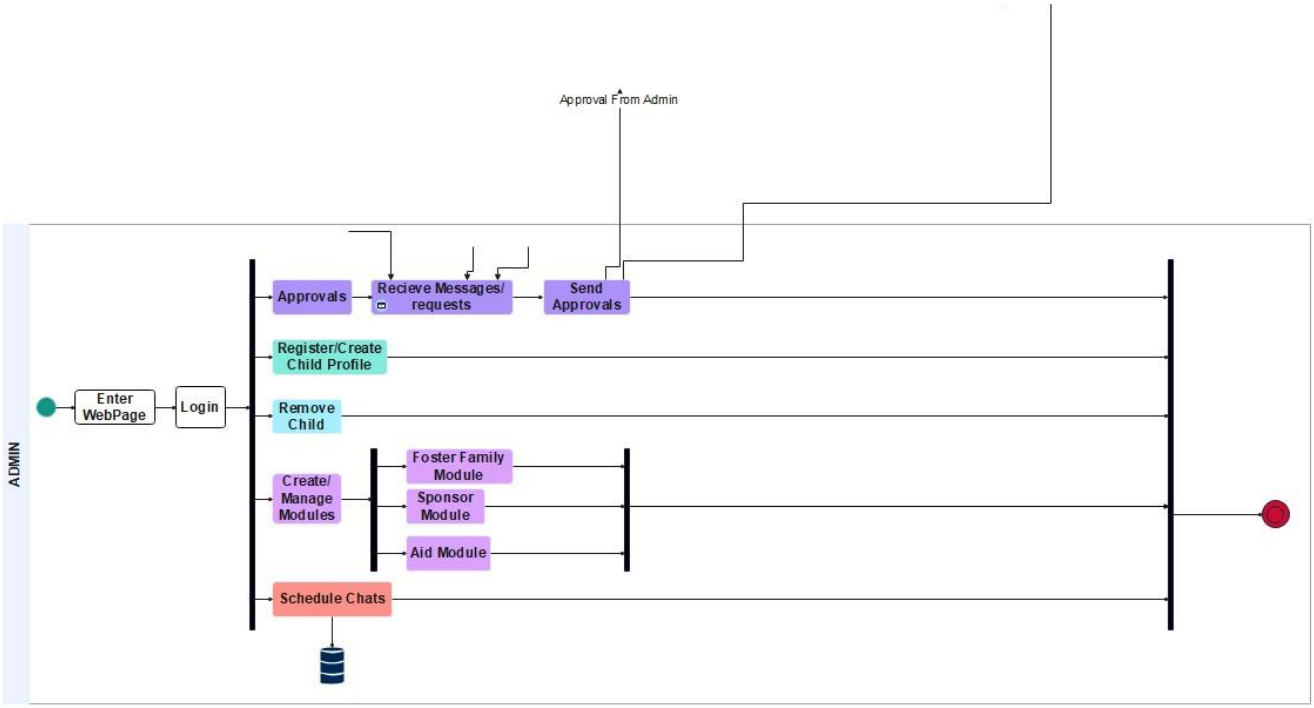


Figure 17: Admin BPMN Diagram

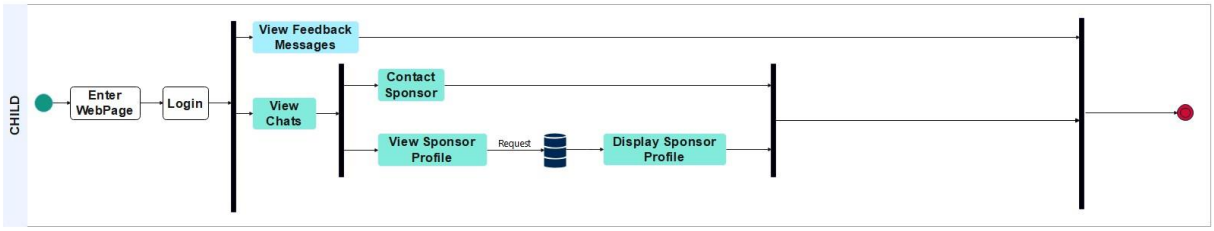


Figure 18: Child BPMN Diagram

4.2.5 DFD Diagrams

Context DFD

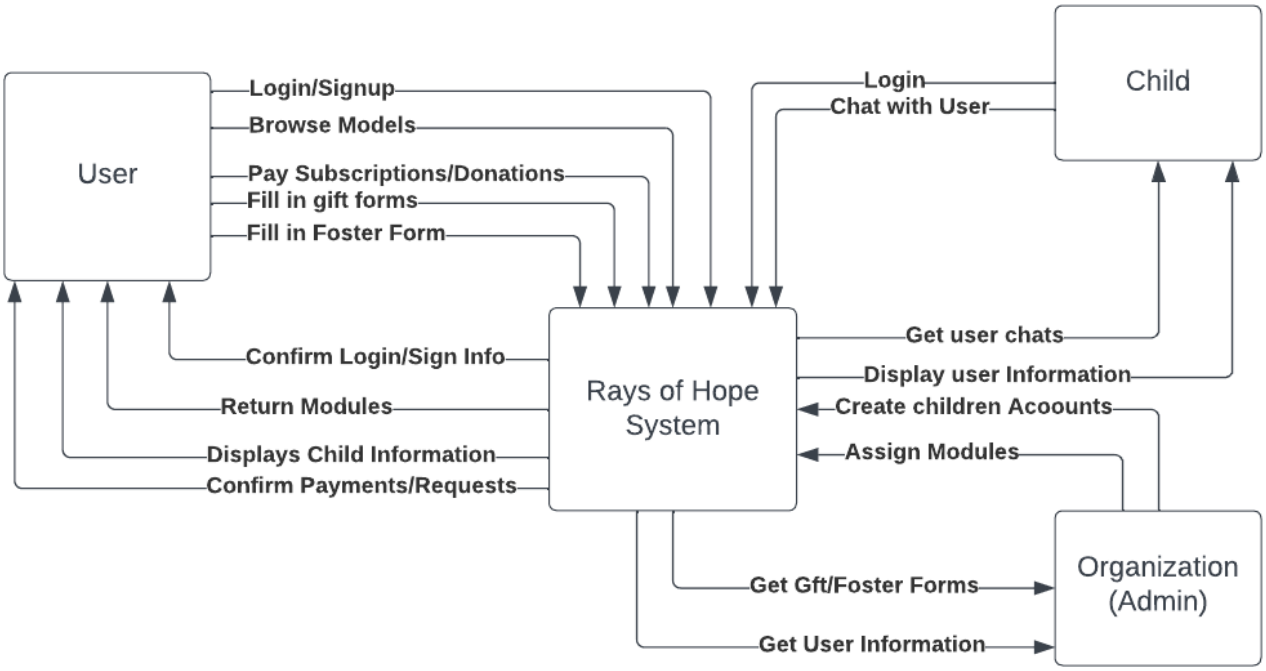


Figure 19: Context DFD

Level Zero Diagram

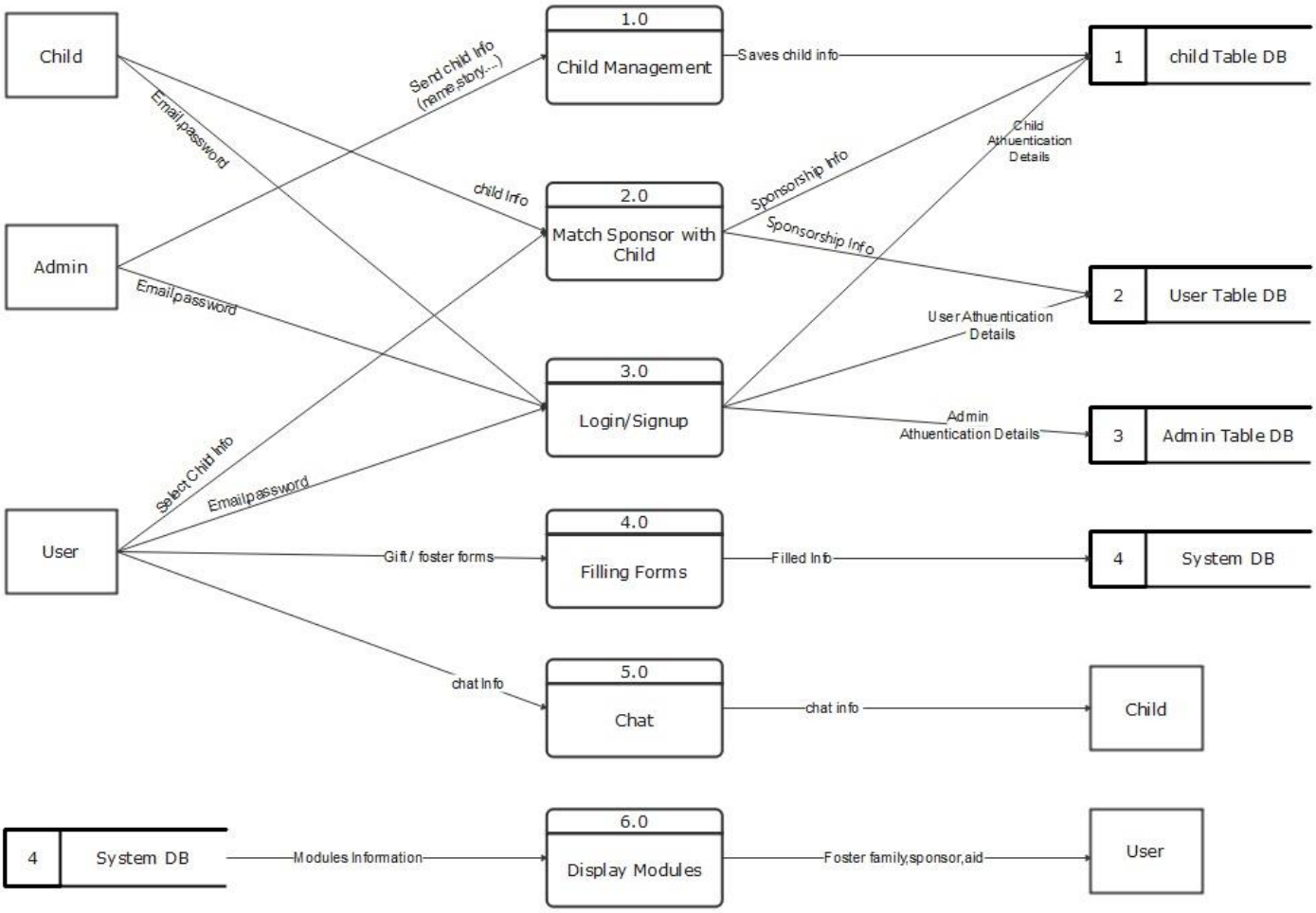


Figure 20: Level Zero Diagram

4.2.6 E-R Diagrams

Conceptual E-R Diagram

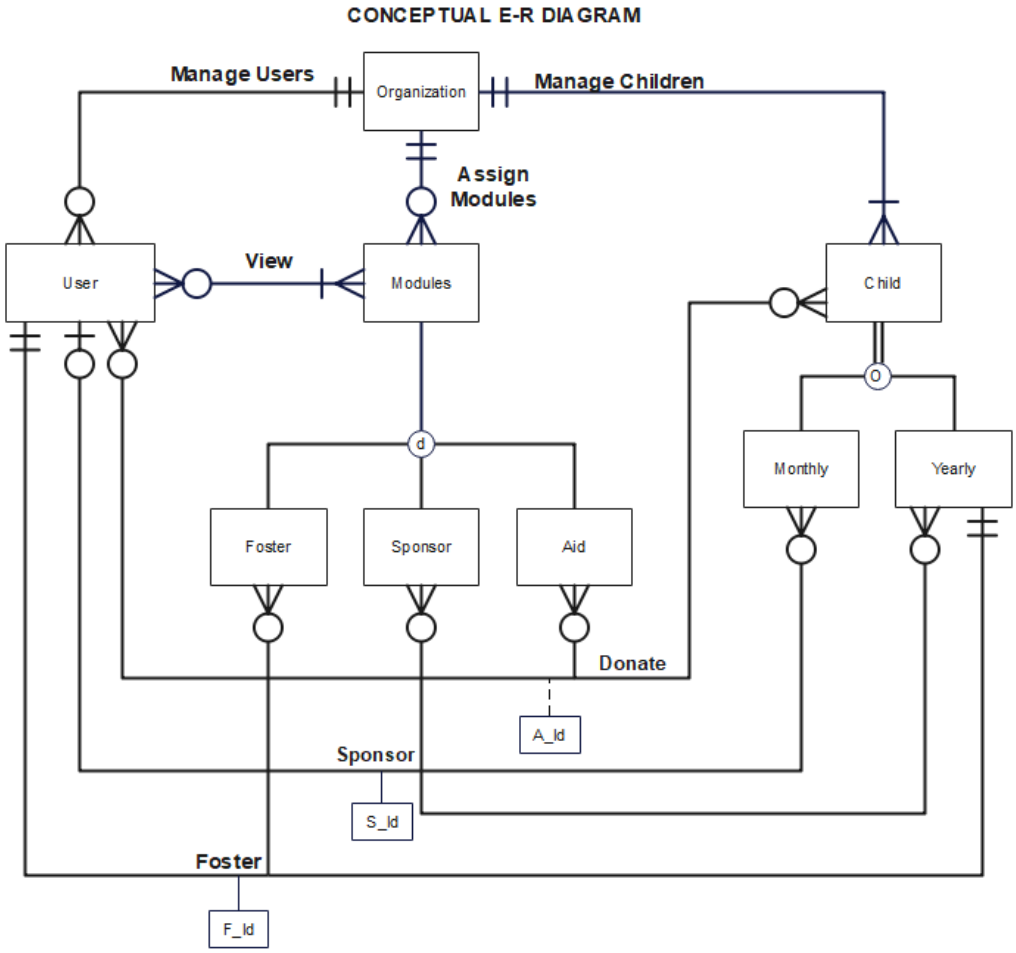


Figure 21: Conceptual E-R Diagram

Logical E-R Diagram

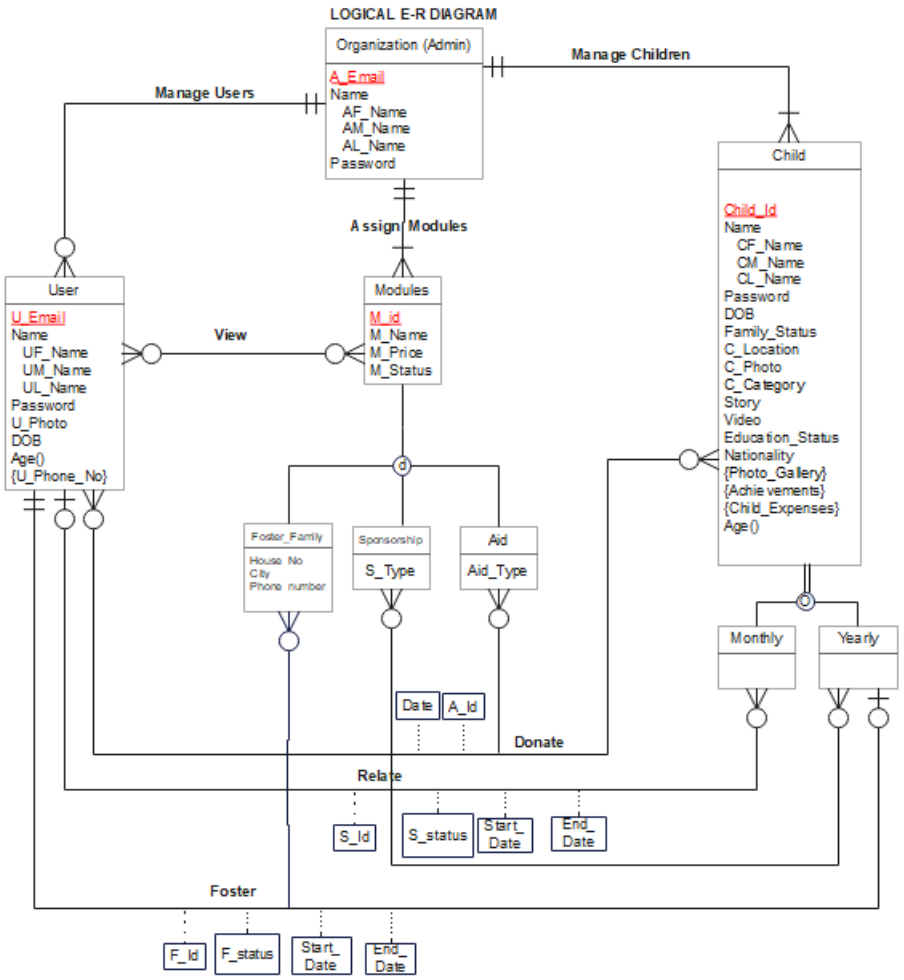


Figure 22: Logical E-R Diagram

E-R Tables

TABLES	
Organization	A_Email , AF_Name , AM_Name , AL_Name , Password
User	U_Email , UF_Name , UM_Name , UL_Name , Password , U_Photo , DOB , A_Email
Modules	M_id , M_name , M_price , M_Status , A_Email
Foster Family	M_id , House_No , City , Phone_number
Sponsorship	M_id , S_type
Aid	M_id , Aid_type
Child	Child_id , CF_Name , CM_Name , CL_Name , Password , DOB , Family_Status , C_Location , C_photo, C_Category , Story , Video , Education_Status , Nationality , Photo_Gallery , A_Email
Monthly_Child	Child_id
Yearly_Child	Child_id
View	U_Email , M_id
User_Phone_No	U_Email , Phone_No
Donate	U_Email , Child_id , M_id , A_Id , Date
Relate	U_Email , Child_id , M_id , S_Id , S_Status , Start_Date , End_Date
Foster	U_Email , Child_id , M_id , F_Id , F_Status , Start_Date , End_Date
Child_Expenses	Child_id , Food_Status , Clothes_Status , Entertainment_Status , Money_Status
Child_Photo_Gallery	Child_id , Child_Photos
Child_Achievements	Child_id , Achievements

Table 16: E-R Tables

Schema Diagram

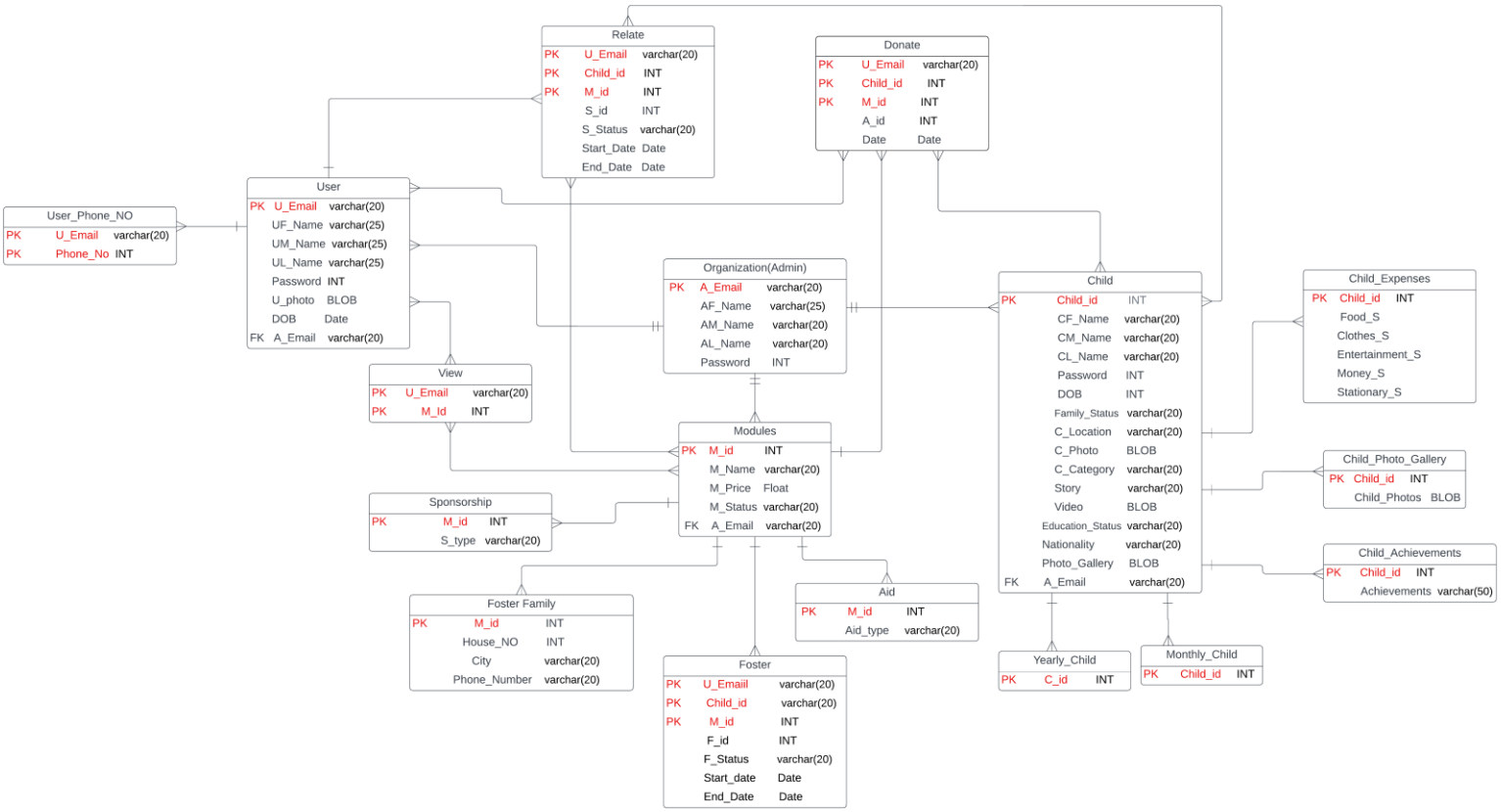


Figure 23: Schema Diagram

4.2.7 Class Diagram

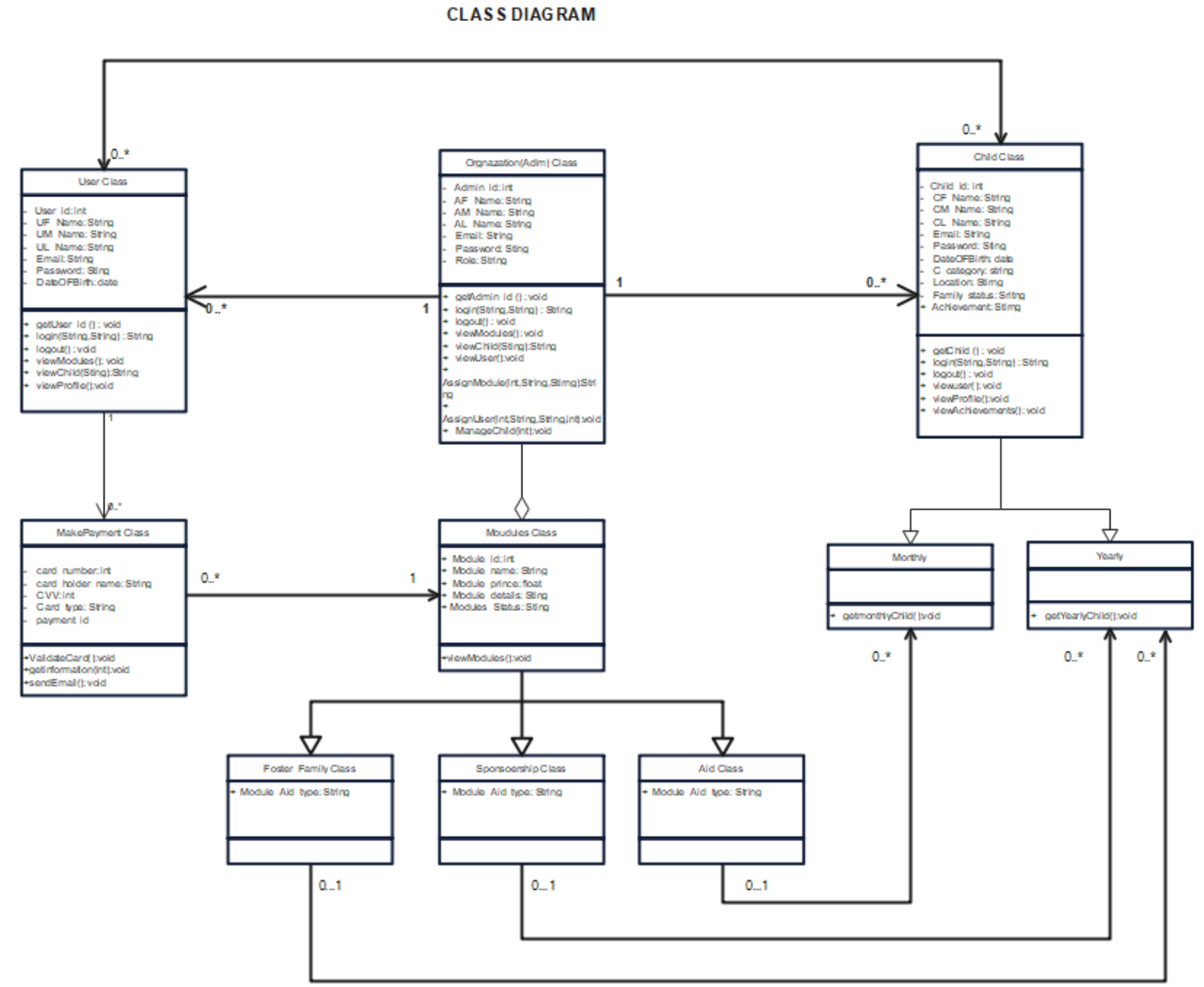


Figure 24: Class Diagram

4.2.8 Physical Database Tables

Create table Organization (A_Email varchar(40) not null, AF_Name varchar(20), AM_Name varchar(20), AL_Name varchar(20), Password varchar(8) not null, Constraint Organization_PK primary key(A_Email))	Create table User(U_Email varchar(40) not null, UF_Name varchar(20), UM_Name varchar(20), UL_Name varchar(20), Password varchar(8) not null, U_photo BLOB, DOB date, Constraint Organization_PK primary key(U_Email), Constraint User_FK foreign key(A_Email) references Organization(A_Email))
Create table Modules(M_id int(5) not null, M_Name varchar(35), M_price int(4), M_Status tinyint(1), Constraint Modules_PK primary key(M_id), Constraint Modules_FK foreign key(A_Email) references Organization(A_Email))	Create table Foster Family(M_id int(5) not null, House_No int(4), City varchar(25), Phone_Number int(10), Constraint FosterFamily_PK primary key(M_id),)
Create table Sponsorship (M_id int(5) not null, S_type varchar(10), Constraint Sponsorship_PK primary key(M_id))	Create table Aid(M_id int(5) not null, A_type varchar(10), Constraint Aid_PK primary key(M_id))

Create table child (Child_id int(10) not null, CF_Name varchar(20), CM_Name varchar(20), CL_Name varchar(20), Password varchar(8) not null, C_photo BLOB, Family_Satus varchar(15), C_location varchar(35), C_category varchar(8), Story varchar(50), Education_status varchar(20), Nationality varchar(25), Photo_gallery BLOB, DOB date, Constraint Child_PK primary key(Child_id), Constraint User_FK foreign key(A_Email) references Organization(A_Email))	Create table Monthly_Child (Child_id int(10) not null, Constraint Child_PK primary key(Child_id),) Create table Yealy_Child (Child_id int(10) not null, Constraint Child_PK primary key(Child_id),) Create table View (U_Email int(40) not null, M_id int(5) not null, Constraint View_PK primary key(U_Email,M_id)) Create table User_Phone_No(U_Email int(40) not null, Phone_No int(10) not null, Constraint User_Phone_NO_PK primary key(U_Email,M_Phone_No))
Create table Donate(U_Email int(40) not null, Child_id int(10) not null, M_id int(5) not null, A_id int(8), Date date, Constraint Donate_PK primary key(U_Email,Child_id,M_id))	Create table Relate(U_Email int(40) not null, Child_id int(10) not null, M_id int(5) not null, S_id int(8), S_status varchar(10), Start_Date date, End_Date date, Constraint Relate_PK primary key(U_Email,Child_id,M_id))

Create table Foster(U_Email int(40) not null, Child_id int(10) not null, M_id int(5) not null, F_id int(8), F_status varchar(10), Start_Date date, End_Date date, Constraint Relate_PK primary key(U_Email,Child_id,M_id))	Create table Child_Expenses(Child_id int(10) not null, Food_ Status int(3), Clothes_Status int(3), Money_ Status int(3), Constraint Child_Expenses_PK primary key(Child_id))
Create table Child_Photo_Gallery(Child_id int(10) not null, Child_photos BLOB, Constraint Child_Photo_Gallery _PK primary key(Child_id))	Create table Child_Achievements(Child_id int(10) not null, Achievements varchar(30), Constraint Child_Achievements _PK primary key(Child_id))

Table 17: List of Physical Database Tables

5. IMPLEMENTATION

5.1 Tools, Technologies and Platforms Used

We will use HTML and CSS with JavaScript to make nice and dynamic user interface so that users can see system friendly.

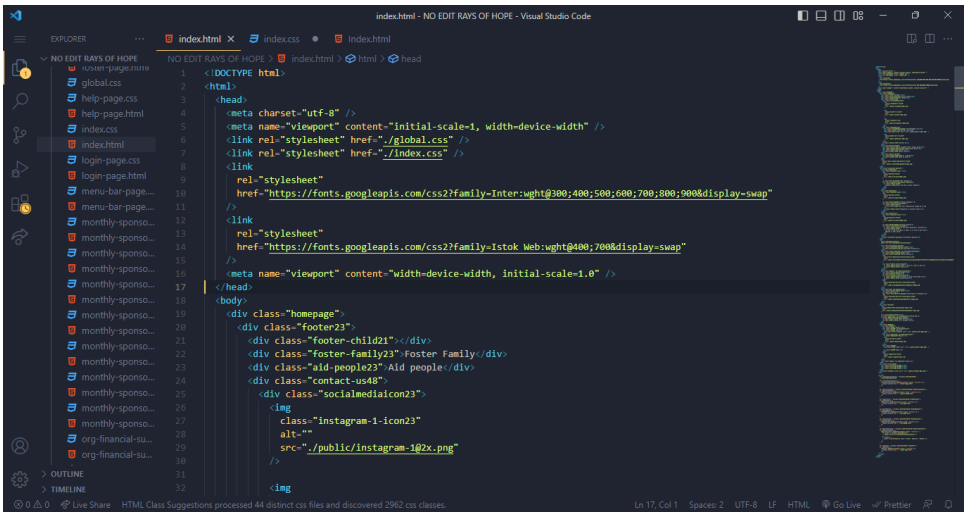
We will connect database to the system by PHP and we will use MySQL as database.

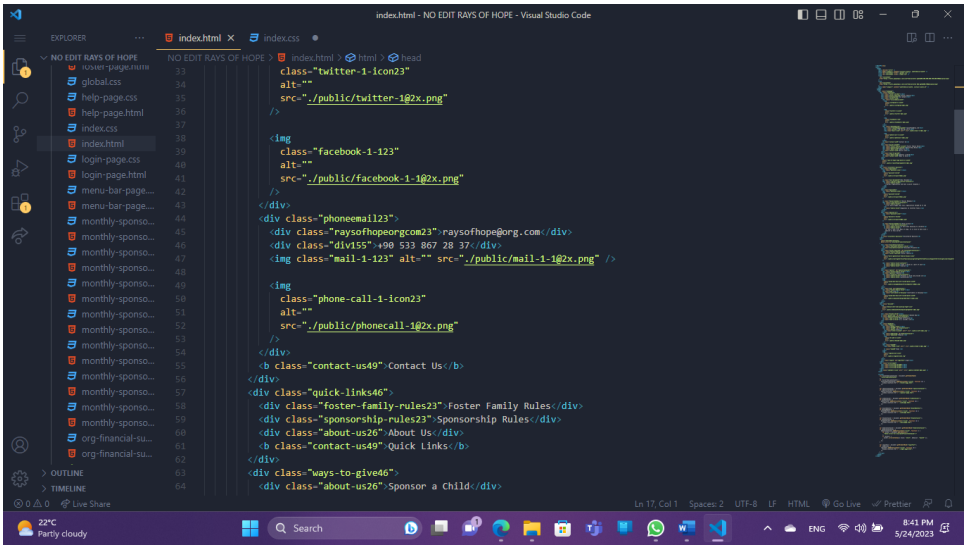
We will create enough amount of table in the database so that inserting, updating and selecting information from database will be much easier.

We will create tables in the database for each role, so that while updating role information this will make things easy for us.

We will avoid of using excess amount of code lines in order to increase the speed of the system and decrease the waiting time of the users.

5.2 Algorithms





5.3 Standards

We used World Wide Web Consortium which is the international standard for the World Wide Web.

For security we used best encryption standards for database encryption in order to take user information safe.

International standards and constraints: 2089-2021 - IEEE Standard for an Age-Appropriate Digital Services Framework Based on the 5Rights Principles for Children

5.4 Detailed Description of the Implementation (Coding)

```
<body>
  <div class="profile-page-1" id="profilePage1Container">
    <div class="sponsorship-history2" id="sponsorshipHistoryContainer">
      <div class="sponsorship-history-child1"></div>
      <div class="sponsorship-history3">Sponsorship History</div>
      <img
        class="right-arrow-2-icon"
        alt=""
        src="./public/rightarrow-32@2x.png"
      />

      <div class="sponsorship-history-child2"></div>
    </div>
    <div class="aid-history2" id="aidHistoryContainer">
      <div class="aid-history-child1"></div>
      <div class="aids-history">Aids History</div>
      <img
        class="right-arrow-1-icon"
        alt=""
        src="./public/rightarrow-32@2x.png"
      />

      <div class="aid-history-child2"></div>
    </div>
    <div class="personal-info1" id="personalInfoContainer">
      <img
        class="personal-info-child7"
        alt=""
        src="./public/rectangle-41.svg"
      />

      <div class="personal-information1">
        <p class="personal-information2">Personal information</p>
      </div>
      <img
        class="right-arrow-3-icon19"
```

```
.line-icon {
  position: absolute;
  top: 48.83px;
  left: 1.61px;
  width: 666px;
  height: 3px;
}
.sponsorship-table-child1,
.sponsorship-table-child2,
.sponsorship-table-child3 {
  position: absolute;
  top: -0.5px;
  left: 221.5px;
  border-right: 1px solid var(--color-palegoldenrod-100);
  box-sizing: border-box;
  width: 1px;
  height: 235px;
}
.sponsorship-table-child2,
.sponsorship-table-child3 {
  left: 342.76px;
  height: 235.01px;
}
.sponsorship-table-child3 {
  left: 462.25px;
  height: 235px;
}
.child-name,
.start-date,
.subscription-id,
.subscription-type {
  position: absolute;
  top: 18.89px;
  left: 0.03px;
  display: inline-block;
  width: 93.9px;
```

```
<body>
  <div class="settings-page-1" id="settingsPage1Container">
    <div class="language3" id="languageContainer">
      <div class="language-inner"></div>
      <div class="language4">
        <span class="language-txt1">
          <p class="language5">Language</p>
        </span>
      </div>
      <img
        class="right-arrow-3-icon13"
        alt=""
        src="./public/rightarrow-32@2x.png"
      />

      <div class="language-child1"></div>
    </div>
    <div class="theme3" id="themeContainer">
      <div class="language-inner"></div>
      <div class="theme4">
        <p class="language5">theme</p>
      </div>
      <img
        class="right-arrow-3-icon13"
        alt=""
        src="./public/rightarrow-32@2x.png"
      />

      <div class="language-child1"></div>
    </div>
    <div class="notification" id="notificationContainer">
      <div class="notification-child"></div>
      <div class="notifications2">Notifications</div>
      <img
        class="right-arrow-3-icon15"
        alt=""
```

```
.language4 {
  position: absolute;
  top: 7px;
  left: 7px;
  letter-spacing: 0.11em;
  text-transform: uppercase;
  display: flex;
  align-items: center;
  width: 150px;
}
.right-arrow-3-icon13 {
  position: absolute;
  top: 7px;
  left: 713px;
  width: 28px;
  height: 27px;
  object-fit: cover;
}
.language-child1 {
  position: absolute;
  top: -0.5px;
  left: 704.5px;
  border-right: 1px solid var(--color-white);
  box-sizing: border-box;
  width: 1px;
  height: 42px;
}
.language3 {
  position: absolute;
  top: 455px;
  left: 459px;
  width: 748px;
  height: 65px;
  cursor: pointer;
}
```

```html
<body>
  <div class="childs-homepage">
    <img class="header-2-icon2" alt="" src="./public/header22.svg" />

    <div class="sidemenu4">
      <div class="sidemenu-child2"></div>
      <div class="lougout4">
        <img class="power-1-icon4" alt="" src="./public/power-1@2x.png" />

        <b class="logout4">Logout</b>
      </div>
      <div class="help11" id="helpContainer">
        <div class="help-inner"></div>
        <img
          class="messenger-1-icon4"
          alt=""
          src="./public/messenger-12@2x.png"
        />

        <div class="home8">Home</div>
      </div>
      <div class="chat10">
        <div class="chat-child2" id="rectangle2"></div>
        <img
          class="messenger-1-icon5"
          alt=""
          src="./public/messenger-1@2x.png"
        />

        <div class="chat14">Chat</div>
        <div class="selection-white4"></div>
      </div>
      <div class="profile8" id="profileContainer">
        <div class="profile-child2"></div>
        <div class="profile9">Profile</div>
        <img class="user-1-icon4" alt="" src="./public/user-1@2x.png" />
```

```css
.power-1-icon4 {
  position: absolute;
  top: 0;
  left: 0;
  width: 37px;
  height: 37px;
  object-fit: cover;
}
.logout4 {
  position: absolute;
  top: 1px;
  left: 47px;
  letter-spacing: 0.15em;
}
.lougout4 {
  position: absolute;
  top: 961px;
  left: 28px;
  width: 149px;
  height: 37px;
  color: var(--color-white);
}
.help-inner {
  position: absolute;
  top: 0;
  left: 0;
  background-color: var(--color-gray-100);
  width: 285px;
  height: 52.09px;
}
.messenger-1-icon4 {
  position: absolute;
  top: 4px;
  left: 41px;
  width: 30px;
```

```html
<body>
  <div class="fill-gift-form-chat">
    <div class="search10">
      <div class="search-child3"></div>
      <div class="search11">Search</div>
      <img
        class="magnifying-glass-1-icon6"
        alt=""
        src="./public/magnifyingglass-1@2x.png"
      />
    </div>
    <div class="chats10">
      <div class="chats-child18"></div>
      <img class="chats-child19" alt="" src="./public/rectangle-34.svg" />

      <img class="send-1-icon4" alt="" src="./public/send-1@2x.png" />

      <div class="type-a-message4">Type a message....</div>
      <img
        class="attach-paperclip-symbol-1-14"
        alt=""
        src="./public/attachpaperclipsymbol-1-1@2x.png"
        id="attachPaperclipSymbol11"
      />
    </div>
    <div class="chats11">
      <div class="chats-child20"></div>
      <div class="button">
        <div class="button-child"></div>
        <b class="fill-gift-form">Fill Gift Form</b>
      </div>
      <img
        class="right-arrow-3-icon5"
        alt=""
        src="./public/rightarrow-31@2x.png"
        id="rightArrow3Image"
```

```css
.fill-gift-form {
  position: absolute;
  top: 23px;
  left: 50px;
}
.button {
  top: 262px;
  left: 103px;
  width: 377px;
  height: 99px;
}
.right-arrow-3-icon5 {
  position: absolute;
  top: 15px;
  left: 8px;
  width: 53px;
  height: 53px;
  object-fit: cover;
  cursor: pointer;
}
.chats11 {
  position: absolute;
  top: 194px;
  left: 798px;
  width: 584px;
  height: 637px;
  font-size: var(--font-size-26xl);
  color: var(--color-white);
}
.chat2-child4 {
  position: absolute;
  top: 0;
  left: 0;
  border-radius: var(--br-mini);
  background-color: var(--color-palegoldenrod-400);
  box-shadow: 0 7px 4px rgba(0, 0, 0, 0.25);
```

```html
<body>
  <div class="help-page-2">
    <div class="help">
      <div class="help1">
        <img class="help-1-icon" alt="" src="./public/help-1@2x.png" />

        <b class="help2">Help</b>
      </div>
    </div>
    <div class="header-2">
      <div class="menu-button">
        <div class="menu-button-child"></div>
      </div>
      <img class="logo-icon" alt="" src="./public/logo.svg" />

      <div class="help3" id="helpContainer2">
        <b class="help4">Help</b>
        <img class="info-1-icon" alt="" src="./public/info-1@2x.png" />
      </div>
      <div class="modules" id="modulesContainer">
        <b class="modules1">Modules </b>
        <img class="d-cube-1-icon" alt="" src="./public/3dcube-1@2x.png" />
      </div>
      <div class="home" id="homeContainer">
        <img class="home-1-1" alt="" src="./public/home-1-1@2x.png" />

        <b class="home1">Home </b>
      </div>
    </div>
    <div class="sidemenu">
      <div class="sidemenu-child"></div>
      <div class="lougout">
        <img class="power-1-icon" alt="" src="./public/power-1@2x.png" />

        <b class="logout">Logout</b>
      </div>
      <div class="help5" id="helpContainer3">
```

```css
.help,
.help1 {
  position: absolute;
  top: 0;
  left: 0;
  width: 344px;
  height: 96px;
}
.help {
  top: 199px;
  left: 634px;
  font-size: var(--font-size-29xl);
}
.menu-button-child {
  position: absolute;
  top: 0;
  background: linear-gradient(180deg, #693000, rgba(105, 48, 0, 0));
}
.menu-button,
.menu-button-child {
  left: 0;
  width: 1440px;
  height: 102px;
}
.help4,
.logo-icon,
.menu-button {
  position: absolute;
  top: 0;
}
.logo-icon {
  left: 1280px;
  width: 124px;
  height: 166px;
}
```

6. TESTING

We would like to preface this section by acknowledging that it is impossible to guarantee 100% test coverage, regardless of the number or nature of tests performed. As stated by Qurora, "No software is bug-free, but a tester brings Quality to a software. A good software testing company focuses on quality bugs and aids in hurdle-free delivery." Making claims of having discovered all possible bugs in a large web application would be unrealistic and devoid of meaning.

However, it is feasible to increase the number of tests conducted and observe a corresponding increase in the number of bugs discovered. In light of this, we conducted repeated tests using different test environments. Recognizing that our time was finite, we aimed to maximize the number of tests conducted within the given constraints. To achieve this, we opted to utilize online, open-source, and automated testing tools, which allowed us to incorporate a multitude of test scenarios, thereby shortening the testing timeline.

Our primary objective was to ensure that every requirement outlined in the Software Requirements Specification (SRS) document was mapped to a corresponding functionality in our application. While implementation we were continuously testing out if functions are working. For example, list of children was returned correctly according to their type. Images, text, videos are placed in the correct desired area. Links between pages are processed correctly.

Additionally, we diligently executed and passed all planned tests related to performance, and other pertinent concerns. Once these steps were completed and verified, we proceeded to validate our end product.

It is essential to note that our testing process, while comprehensive, is not infallible. Despite our best efforts, there is always a possibility that some bugs may remain undetected. However, by following industry best practices and employing a systematic approach to testing, we strived to mitigate such occurrences to the best of our abilities. We are confident that our testing efforts have significantly improved the quality and reliability of our web application.

Test1:

Project name	Rays of Hope								
Module Name	Login Functionality								
Created By	Mahamat Hassan								
Executed By	Mahamat Hassan								
Test case #	1								
Executed Date	24/5/2023								
Test Case ID	**Test Case Description**	**Pre-Step**	**Test Step**	**Preconditions**	**Test Data**	**Expected Result**	**Actual Result**	**Status**	**Comments**
Test the Loin Functionality in Rays of Hope	Verify login functionality with valid Email& password		Navigate to login page			Able to see the login page	As expected,	Pass	
			Enter valid username	Valid Username	Username: Hassan.Mohajer6@gmail.com	Credential can be entered	As expected,	Pass	
			Enter valid password	Valid password	Password: ********@!	Credential can be entered	As expected,	Pass	
			Click on login button			User logged in	User logged successfully	Pass	
Test the Loin Functionality in Rays of Hope	Verify login functionality with valid username& Invalid password		Navigate to login page			Able to see the login page	As expected,	Pass	
			Enter valid username	Valid Username	Username: Hassan.Mohajer6@gmail.com	Credential can be entered	As expected,	Pass	
			Enter valid password	invalid password	Password: ********@?	Credential can be entered	As expected,	Pass	
			Click on login button			User logged in	Unsuccessfully logged	Fail	
Test the Loin Functionality in Rays of Hope	Verify login functionality with invalid username& valid password		Navigate to login page			Able to see the login page	As expected,	Pass	
			Enter valid username	invalid Username	Username: Hassan.Mo6@gmail.com	Credential can be entered	As expected,	Pass	
			Enter valid password	valid password	Password: ********@!	Credential can be entered	As expected,	Pass	
			Click on login button			User logged in	Unsuccessfully logged	Fail	
Test the Loin Functionality in Rays of Hope	Verify login functionality with invalid username & password		Navigate to login page			Able to see the login page	As expected,	Pass	
			Enter valid username	invalid Username	Username: Hassan.Mo6@gmail.com	Credential can be entered	As expected,	Pass	
			Enter valid password	invalid password	Password: ********@!	Credential can be entered	As expected,	Pass	
			Click on login button			User logged in	Unsuccessfully logged	Fail	

Table 18: Test 1

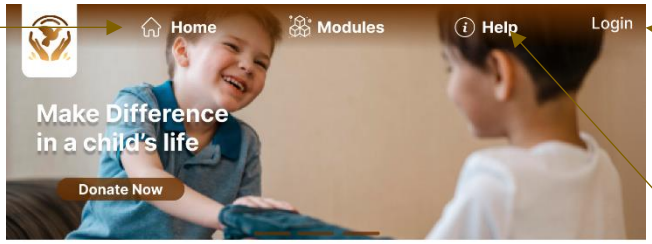
Test 2:

Project name	Rays of Hope								
Module Name	Search for Child								
Created By	Mahamat Hassan								
Executed By	Mahamat Hassan								
Test case #	2								
Executed Date	24/5/2023								
Test Case ID	Test Case Description	Pre-Step	Test Step	Preconditions	Test Data	Expected Result	Actual Result	Status	Comments
Search for child in Rays of Hope	Verify search functionality (looking for a child)		Navigate to main page			Able to see the main page	As expected,	Pass	
			Navigate to sponsor model	Login the system		Able to see the sponsor page	As expected,	Pass	
			Enter child name	Valid child name		Credential can be entered	As expected,	Pass	
			Click on search way button	Child name entered		Can click on button	As expected,	Pass	
			Display child info	Child name entered		Child info is displayed	As expected,	Pass	
Search for child in Rays of Hope	Verify search functionality (looking for a child)		Navigate to main page			Able to see the main page	As expected,	Pass	
			Navigate to sponsor model	Login the system		Able to see the sponsor page	As expected,	Pass	
			Enter child name	Invalid child name		Credential can be entered	As expected,	Pass	
			Click on search way button	Child name entered		Can click on button	As expected,	Pass	
			Display child info	Child name entered		Child info is displayed	Unsuccessful ly search	Fail	

Table 19: Test 2

7. USER GUIDE OF THE SYSTEM

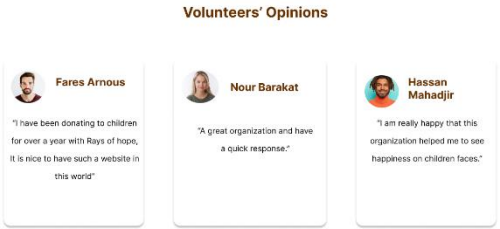
User can click on this to be directly directed to home page.



User clicks here to login or signup.

User can click on this to be directly directed to help page.

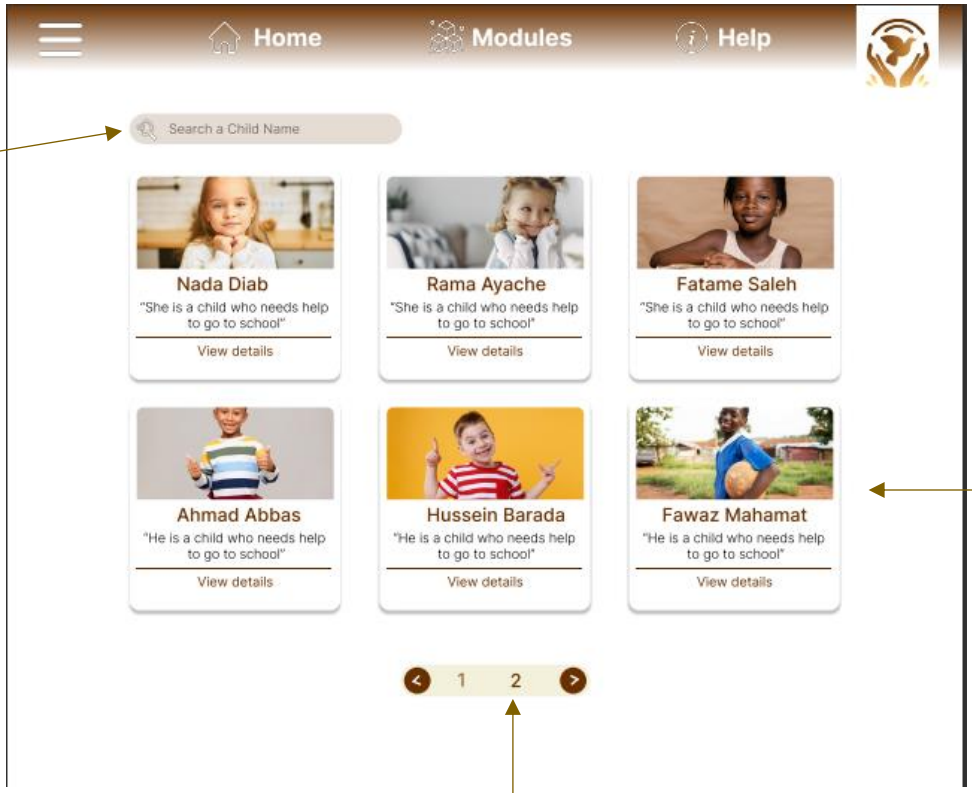
This part to choose type of project to help children.



User can see other volunteer opinions.

This part contains information about the organization and the contact info.

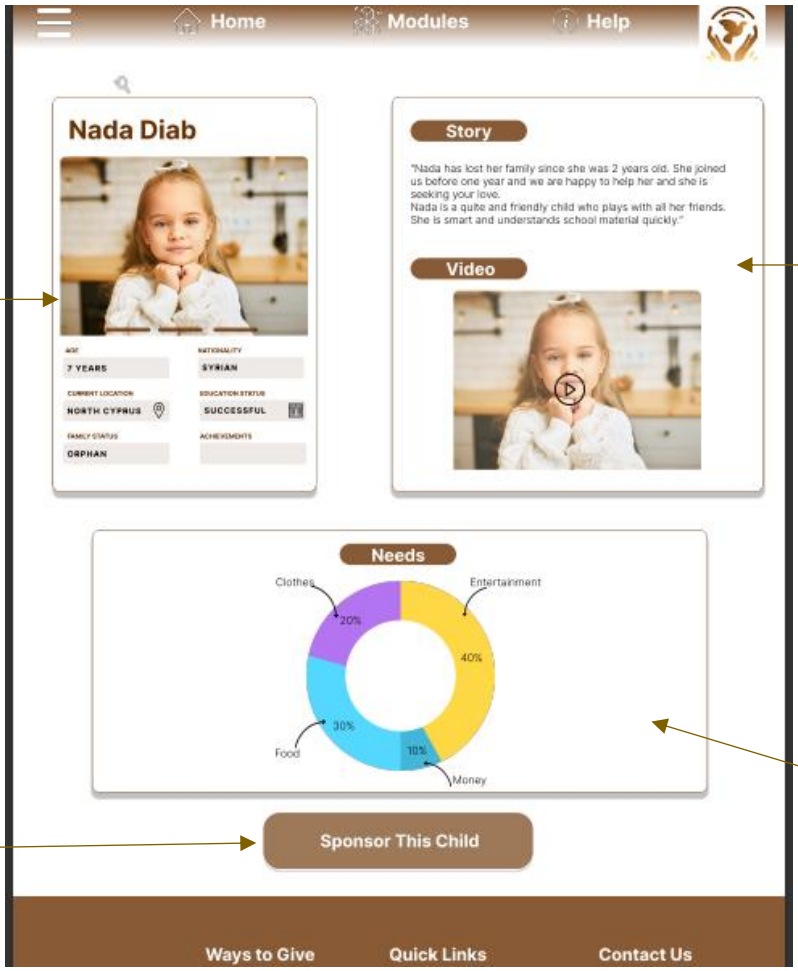
This is an assistant if user has a question.



User can search for a specific child from here.

User can select a child from the list of children.

User can use this to see the second page of the sponsored children.

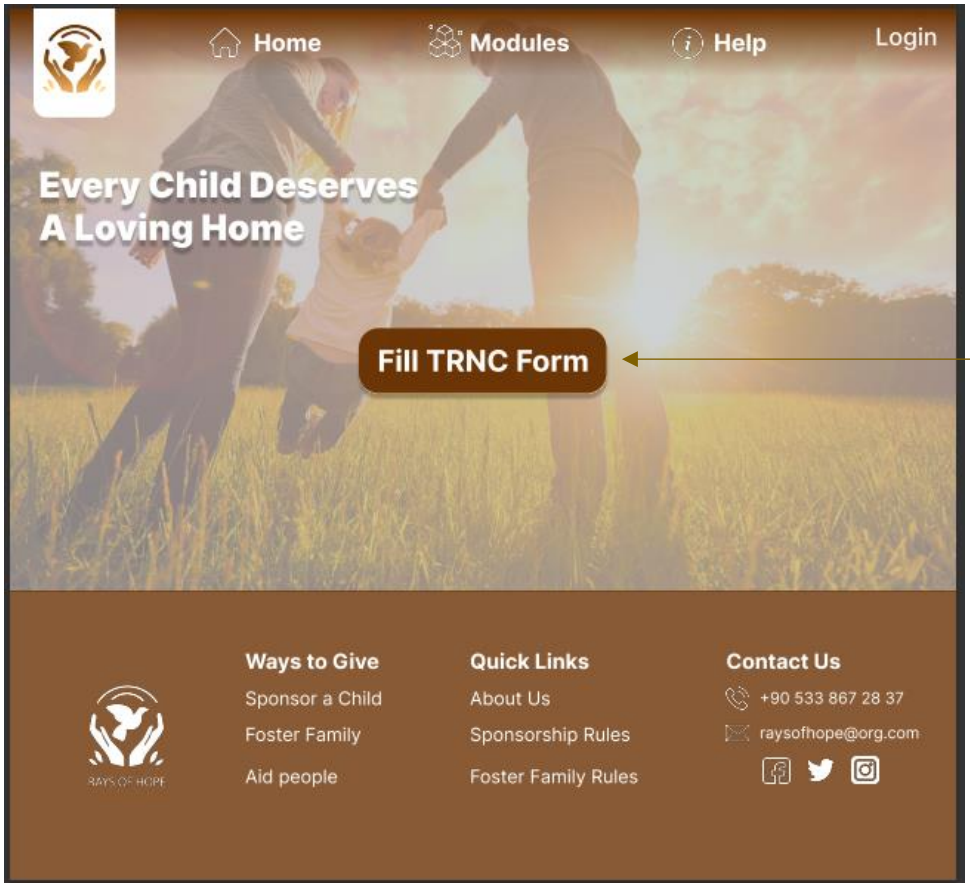


Child details are displayed here.

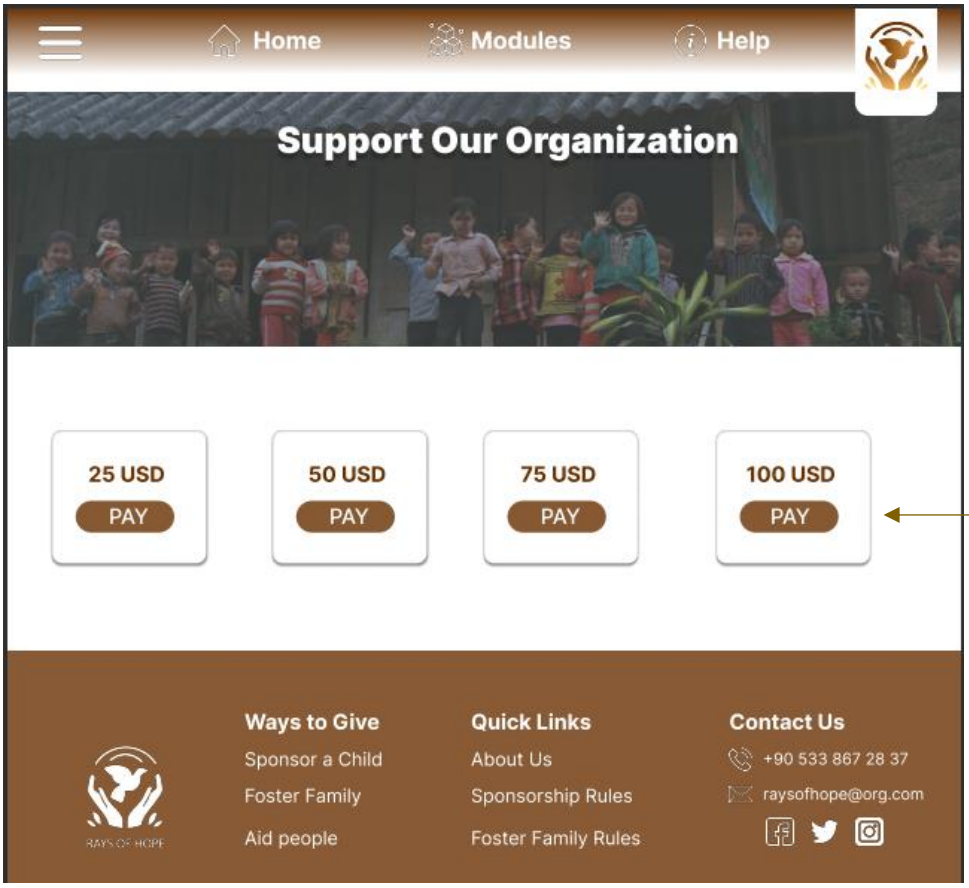
User can read child info and see a video of the child.

User can see child need percentage of food and clothes.

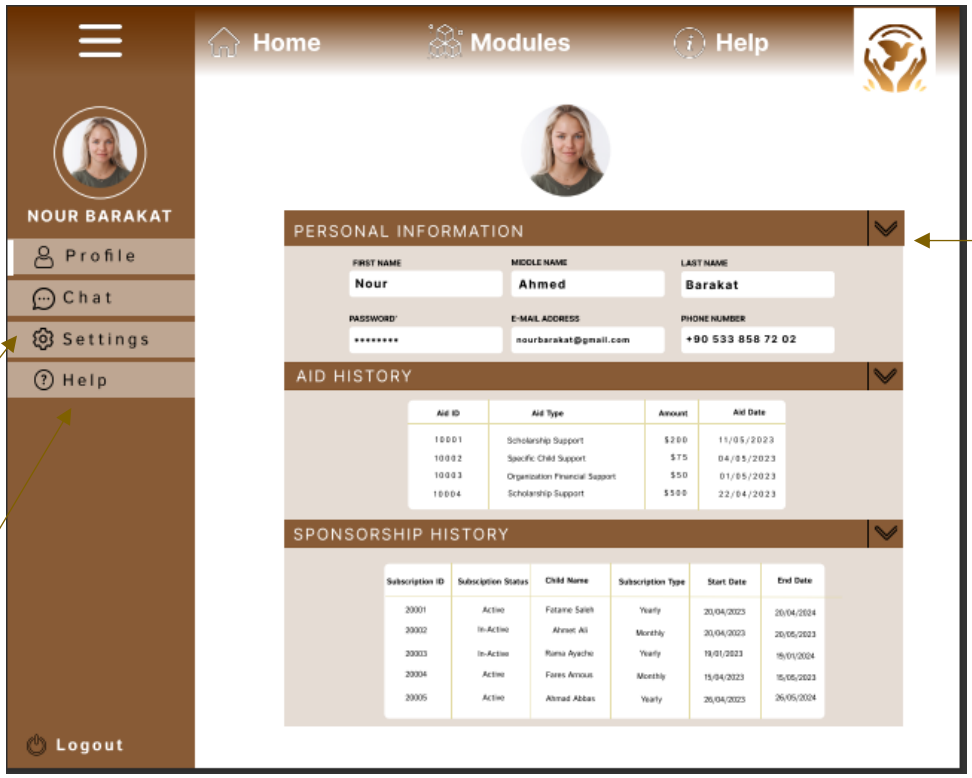
User can sponsor child by clicking on this.



User can be a foster by clicking this and fill the form.



User can support the organization by choosing an amount to pay from this section.

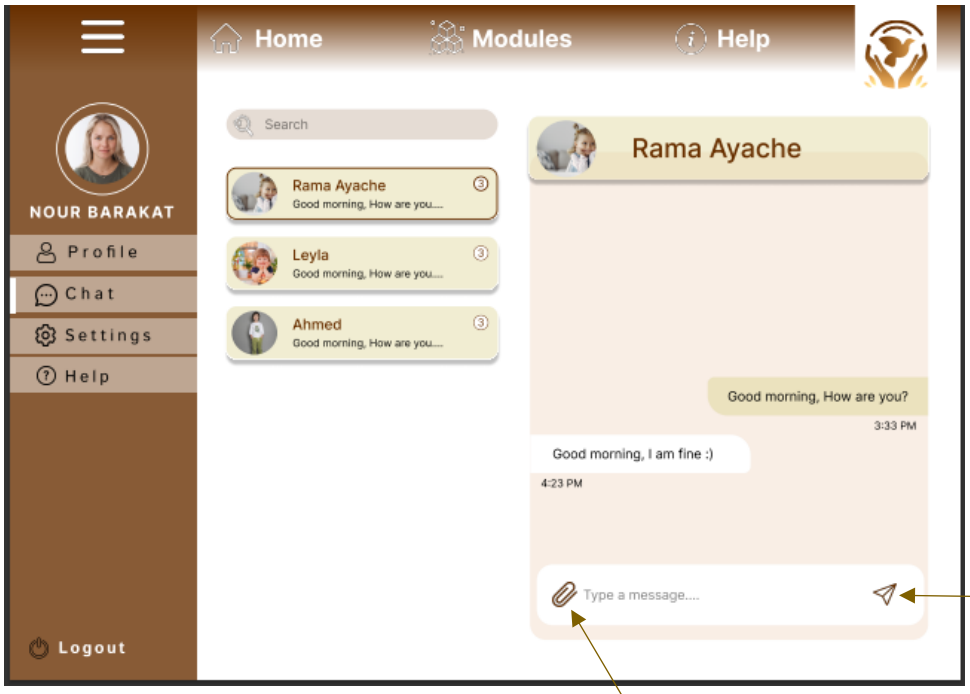


User can navigate to chat.

User can navigate to settings.

User can get help from this section.

User can view his/her information and history of support.



User can send message to child by clicking on this.

User can send photos, call, video call, send voice messages, fill a gift form from this button.

User can logout from the system by chickling on this.

8. DISCUSSION

At the end of the project, we designed and developed a charitable system where helpers from all over the world can be given the chance to volunteer and help children in need. Our system contains three different modules (Foster Family, Sponsor, and Aid) so that users can provide help in variety of ways. Our system guarantees that aid is being delivered to the children.

Compared to similar projects, our system best advantage is that it is designed in a friendly way for the user and developed according to their wishes to meet their requirements. Another fact is that our system has various kinds of aiding features including financial and mental support while other systems are limited to specific types of help. Moreover, our system supports responsiveness feature, where it will run on different types of devices.

The system will be beneficial for the children who are dealing with problems like starvation, poverty, desolation, and homelessness because of earthquakes, diseases, and other catastrophes. The creation of such system is a step towards opening the doors of globalization as it allows helpers to volunteer all over the world. Our system will allow boosting up different life aspects of children which minimizes poverty, starvation, and child displacement in a society. Therefore, children that has been helped through our system will have positive drastic change in their educational, mental and social status.

9. CONCLUSION

In conclusion, this system is built to be used by the volunteers who are willing to help the children who are suffering from harsh life conditions. It is a useful system since it gives the chance to everyone to get involved in this charitable experience. During this project, we implemented and tested all of the functionalities required to make sure that all of them are working perfectly with no errors or bugs.

While working on this project, we learnt a deep understanding of different concepts related to software systems. Not only this, but also, we earned more knowledge about the main concepts of software engineering as well as how to use different software more efficiently. Finally, our team made a lot of research to make sure that we are on the right track to come up with the best results.

10. REFERENCES

[1] LucidChart www.lucidchart.com

[2] Figma https://www.figma.com/

[3] Modelio https://www.modeliosoft.com/en/

[4] EdrawMax www.edrawsoft.com

[5] Visual Studio https://visualstudio.microsoft.com/

[6] Flat-Icon https://www.flaticon.com/

[7] Pexels https://www.pexels.com/

APPENDICES

A. Instructions for Installing the System

You can run the html file using any notepad, but preferably visual studio and the system will work.

B. Code for the system

Most 10 important parts of the code is shown in section 5.4.

C. Other relevant material

Nothing extra