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Abstract

Ehsan is an Android application that helps reduce the effort and time in searching for charities and donors approved by the government as well, the idea of this application appeared according to what we see in our real life, so we developed the application to provide an opportunity for donors to search for approved charities. The donor enters his personal information such as name, phone number, etc. in addition to the donation information, and the application delivers the donation to the charity that was donated to it among other charities in the application. As for charitable societies, the application displays all the donations that have reached this association in a smooth manner that facilitates searching for the donor, finding his location, and communicating with him. The admin reviews the association's affiliation requests, then approves or rejects them based on the charity's credibility. The application provides the largest assistance to donors specifically without the need to go to the charity on the ground, which reduces the time and effort required to make the donation process.

After reviewing the previous work, we added some features and improved some of them to reach an application that distinguishes its content from other pre-existing applications and competes for it in this field, as our application contributed to creating a channel linking donors with charitable institutions, promoting social work and charitable work in Jordan. One of the most important additions that can be added to the application is the ability to support the largest possible number of local charities approved by the government. The application will be developed so that it will be able to send notifications to users (charities/donors) and an iPhone version running on IOS to enable access to the largest segment of users, in addition to many of important future works.

ملخص

إحسان هو تطبيق أندرويد يساعد على تقليل الجهد والوقت في البحث عن الجمعيات الخيرية والمتبرعين المعتمدين من قبل الحكومة أيضًا ، ظهرت فكرة هذا التطبيق وفقًا لما نراه في حياتنا ، لذلك قمنا بتطوير التطبيق لتوفير فرصة للمتبرعين للبحث عن الجمعيات الخيرية المعتمدة. يقوم المتبرع بإدخال معلوماته الشخصية مثل الاسم ورقم الهاتف وما إلى ذلك بالإضافة إلى معلومات التبرع ، ويقوم التطبيق بتسليم التبرع إلى المؤسسة الخيرية التي تم التبرع لها في الطلب من بين المؤسسات الخيرية الأخرى. أما بالنسبة للجمعيات الخيرية ، فيقوم التطبيق بعرض جميع التبرعات التي وصلت لهذه الجمعية بشكل سلس يسهل البحث عن المتبرع وإيجاد مكانه والتواصل معه. يقوم المسؤول بمراجعة طلبات الانتماء الخاصة بالجمعية ، ثم يوافق عليها أو يرفضها بناءً على مصداقية المؤسسة الخيرية. يقدم التطبيق أكبر مساعدة للمتبرعين تحديدا دون الحاجة للذهاب للجمعيات الخيرية على أرض الواقع مما يقلل من الوقت والجهد اللازمين لإجراء عملية التبرع.

بعد مراجعة العمل السابق قمنا بإضافة بعض الميزات وتحسين بعضها للوصول إلى تطبيق يتميز بمحتواه عن التطبيقات الأخرى الموجودة مسبقًا ويتنافس معها في هذا المجال ، حيث ساهم تطبيقنا في إنشاء قناة تربط المتبرعين بالمؤسسات الخيرية وتعزيز العمل الاجتماعي والعمل الخيري في الأردن. من أهم الإضافات التي يمكن إضافتها للتطبيق القدرة على دعم أكبر عدد ممكن من الجمعيات الخيرية المحلية المعتمدة من قبل الحكومة. سيتم تطوير التطبيق بحيث يكون قادرًا على إرسال إشعارات للمستخدمين (الجمعيات الخيرية / المتبرعين) وإصدار نسخة تعمل على نظام (IOS) لتمكين الوصول إلى أكبر شريحة من المستخدمين ، بالإضافة إلى العديد من الأعمال المستقبلية المهمة.

Chapter 1
Introduction

1.1 Introduction

Our idea came from the above, where our application project connects two types of people who were mentioned previously, let's call them (donors or charities, needy).

There are many needy people that we do not know about, in addition to the fact that 60% of them do not seek help or money from others because of their shyness, and with the increase in the epidemiological situation of the Coronavirus, many companies have been disrupted and the numbers of unemployment increased, which made the percentage of needy families constantly increasing and thus became The role of organizations and charities is greater in providing aid.

On the other hand, there are many families, individuals, and business owners who have a lot of aid that is surplus to their needs or do not want it anymore, and it can be donated and given to people who can use it and benefit from it more, and capitalists can donate monthly or yearly regularly to associations through Allocating certain amounts of money through which to buy aid and equipment that specifically support the charity to which it has been donated.

1.2 Background

Charities have emerged all over the world as collective movements seeking achievement social development; this is because they are social organizations that have goals and resources that they seek to achieve it depends on it in all its activities, to become one of the most prominent and important social supplements in addition to the governmental sector, it is in the essence that countries adopt them in achieving development a cultural and intellectual paper consciousness [1].

Charitable societies constitute an important place in the social and political development of societies the modern society; as it became an effective role in the intelligentsia, as showed the features of society civil society, which represents all members of society, in addition to the interest in achieving social, economic and political development within the framework of organized work that is tightly controlled by its mechanisms and procedural laws. And charities also seek, in their entirety, to provide assistance and strive for the advancement and advancement of all members of society [1].

According to developments in the world, all traditional businesses have turned into electronic businesses, and this indirectly led to a reduction in job opportunities available to individuals in societies, and this harmed families' income in general. Also with the emergence of the global epidemic called Coronavirus, some traditional work has almost completely stopped, which has increased the financial burden on individuals and families [2].

As a result of the foregoing, the need for charitable organizations and associations, in particular, has increased because of their social responsibility in providing assistance and aid.

1.3 Problem Statement

A. The difficulty of finding and searching for the target people by charities and donors.
B. The difficulty of finding donors for those in need in order to help them.
C. Low likelihood of finding a way to connect donors and charities to those in need.

1.4 Project Objective

The project objectives can be summarized through the following points:

A. Limiting all government-documented charities to one application.
B. Ensure that donations reach the organizations without tampering with them.
C. Facilitating the donation process between individuals and charitable organizations.
D. Easy access to the donors by locating them on the map.

1.5 Motivations

According to what we see in our daily life in our relatively rural communities and what can be seen in terms of clothes, electrical equipment, and other things thrown in garbage containers that others and the needy in particular can reuse and benefit from greatly. We have developed an application that helps people in need in a fast and cost-free way using technology, by using this application we can avoid what people in need feel when they ask for help.

This application was developed with a vision to promote charitable work for valuable social reasons in Jordan, by providing a portal to reach the target audience and facilitate donation.

This application will eliminate the problems of donors in terms of time and distance, as though this application there will be a channel linking donors with those in need.

1.6 Project Scope

The application has been developed to cover donor people, Charites, interrelated organization or government committees which are responsible for deliver the donor donations to the needy ones, and needy people in Jordan.

1.7 Contribution

In this project, we aim to identify and conveniently connect actual vulnerable individuals and real and approved charities and this will encourage the donor not to spend things that others will profit from.

1.8 Organization of the project Outline

The first chapter provided a brief introduction and background on charities, donors, people in need, and the problems they face in general, in addition to a simple introduction to the role of charitable organizations and societies and their increasing effectiveness according to the current problems.

Chapter 2
BACKGROUND AND RELATED WORKS

2.1 Introduction

In this chapter, a description of the application is presented that is similar to the developed application and compares it in terms of features, advantages, and disadvantages, and differs from the developed application. For each application developed there are specific goals to be achieved, while the goals differ between applications and there are similarities between them. The differences and similarities between the application and the developed application are discussed in detail. In this chapter, we also discussed some of the applications in which donations are organized between individual donors and charitable organizations.

The Ehsan application has been created for those wishing to donate to charitable organizations and charities flexibly and easily that provides donors with a unique experience that differs from previous donation operations so that the application is keen to link donors with a group of charitable organizations ready to receive the in-kind donations they own.

This application consists of two applications that are linked together in one database, one of which serves specifically for donors and the other in turn serves the charitable organizations themselves.

Where the first application, which is for donors, facilitates the donation process by specifying the types of donation required (clothes of all kinds, books, emergency tools, and household furniture), in addition to an area that allows the donor to accurately detail and describe donations, and a map that allows him to locate his location, in addition to a list that displays donors All charitable organizations documented by the government to provide him with an easier selection process.

As for the second application, it works differently from the previous one, as it displays the donations for the same organization and not from other organizations regularly and in a simple way that is formed by displaying the name of the donor, and what he has selected for the donation, in addition to the description that the donor wrote, and he follows it with a set of options Such as displaying the donor's website, the direct contact feature, in addition to sending e-mails by e-mail.

2.2 Theoretical background

We will face several difficulties during executing this project till it's written, but we think That the most difficult thing is to find an approved charity to work with and to convince some authorized charity to negotiate with us.

2.3 Related Application

We have reviewed the current apps and studies that are similar to ours and discussed the most important features that each app has and the country in which each app operates. We made a comparison table for all the apps we reviewed and compared them with suggested features and improvements serving donors, charitable organizations, associations, and individuals.

For example, we tried some applications, and we reviewed their interfaces and how they work, and we monitored the tasks that each application performs, but we encountered some problems in the process of checking the application and the speed of obtaining the request, and that is because some applications work on this idea outside Jordan, and examples of these applications:

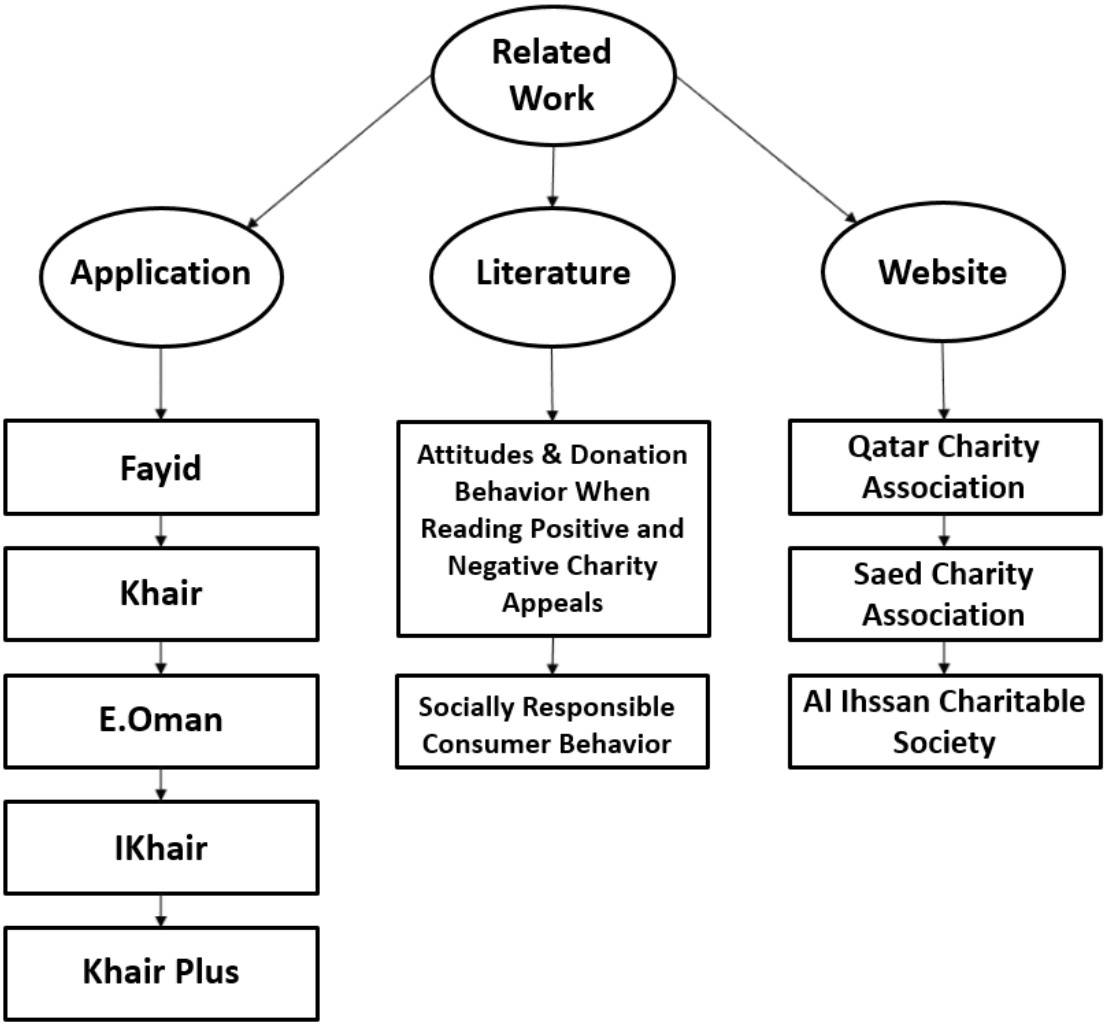

Figure 2.3: Branches of Related Work.

2.3.1 Fayid

It is a developed application that provides comprehensive data on charities near the user's location, and the goal of the application is to facilitate the donation process

Features of the application: [3]

A. Easy access to the nearest charity headquarters for the user through an interactive map.

B. Providing numbers for charities to communicate with them and benefit from the donation service.

Figure 2.3.1: Fayid Application.

2.3.2 Khair

This application is affiliated with the Saudi Endowment Foundation, and the work system of the Saudi Khair application is significantly different, as the cases that need help are presented in this application and the donor reads the circumstances of the case and then can communicate with this case, and it is only a link between the donor and the one who need for these donations. [4]

Figure 2.3.2: Khair Application.

2.3.3 Official Donations App (E.Oman)

This application talks about the tremendous growth of donations through the mobile platform in recent years, and the promotion of the donation culture within the Omani society through the application of donations available on smart phones and this application facilitates the donation process for Omani citizens and residents by one click from anywhere, at any time.

The Donations application was developed with the aim of promoting charitable work for valuable social purposes in the Sultanate of Oman, by providing an electronic portal to facilitate the payment of donations to charities supported by the Ministry of Social Development. This app supports charitable humanitarian efforts by eliminating donor problems in time and distance using technology. This online channel connects donors with beneficiaries. [5]

Figure 2.3.3: E.Oman Application.

2.3.4 IKhair

The idea of the application is to provide a platform for smartphone users to donate in the way they want, whether through sponsoring an orphan, or a charitable institution and others, using the phone to transfer donations, and it is transferred to the association or institution that the donor wants without any discounts or fees incurred by the donors. [6]

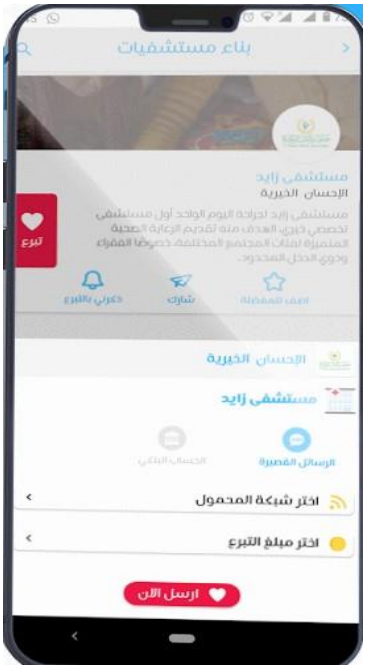

Figure 2.3.4: Ikhair Application.

2.3.5 Khair Plus

The online donation platform allows donations to be received online, and the donation is made directly from the donor to the association's account. A donor can donate any amount. It is also possible to specify the type of donation (charity, zakat, orphan sponsorship, medical assistance, etc.). [7]

Figure 2.3.5: Khair Plus Application.

2.3.6 Attitudes and Donation Behavior When Reading Positive and Negative Charity Appeals

One study showed that the behavior of donors depends mainly on the type of promotional advertisement provided by the charitable organization. The study provided a detailed and documented explanation of two possible directions for the behavior of individual donors when seeing positive advertisements for donation and negative for non-donation, as the study confirmed that positive promotional advertisements have a greater impact on Motivate donors to donate due to the impact of negative ads on them. [8]

2.3.7 Socially Responsible Consumer Behavior

This study seeks to gain an in-depth understanding of disposable behavior in the environment of donating used clothing, as the study presented an interpretative analysis disclosure that demonstrates that the primary motivation for participants' used clothing donation behavior is the need to create space in the closet for something new, and the threat of guilt played an important role during the process. Prior to the donation, specifically in the decision to dispose of or donate a piece of clothing, in addition to the participants' progress to test the utilitarian values and pleasure in relation to the donation behavior, and these values, in turn, affected the intentions of the future donation. [9]

2.3.8 Qatar Charity Association

Qatar Charity is an international non-governmental organization working in the field of development and humanitarian aid since 1992 in accordance with the laws governing the non-profit sector in the State of Qatar. Qatar Charity was established as an institutional expression of a civil will that derives its components from the values, principles, and cultural and civilizational heritage of the Qatari society in order to do good and participate in the international solidarity process effectively and efficiently in addressing the most important humanitarian and development challenges facing poor and needy peoples across the world, as at the forefront of these priorities was helping children Victims of crises and disasters, before Qatar Charity’s fields of work expanded to include various humanitarian and development sectors.

Qatar Charity has spent more than $ 1.2 billion on humanitarian and development work during the past five years, benefiting more than 29 million people around the world. [10]

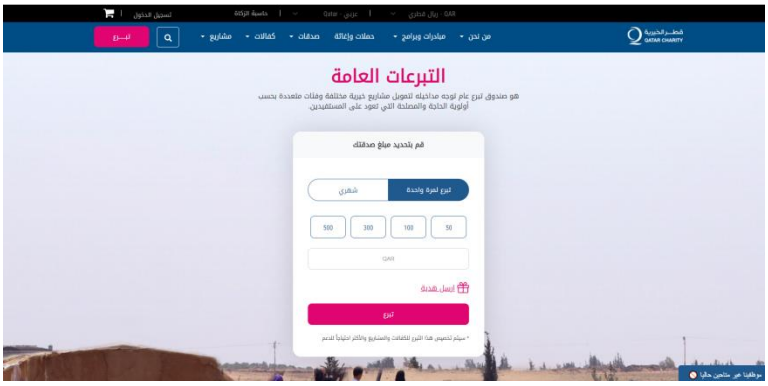

Figure 2.3.6: Qatar Charity Association Website.

2.3.9 Saed Charity Association

The Said Charitable Association is an independent, non-governmental, non-profit Syrian humanitarian organization officially registered in Turkey on July 23, 2014.

SCA aims to provide assistance to the needy and victims of war all over the world; In addition, its endeavor at present is to alleviate the suffering of the Syrian people by delivering aid to all Syrians affected by the ongoing crises in Syria and Turkey.

While carrying out our activities in all sectors, we try to maintain accountability and serve our beneficiaries and adopt international principles of human action in providing assistance and evaluating activities. [11]

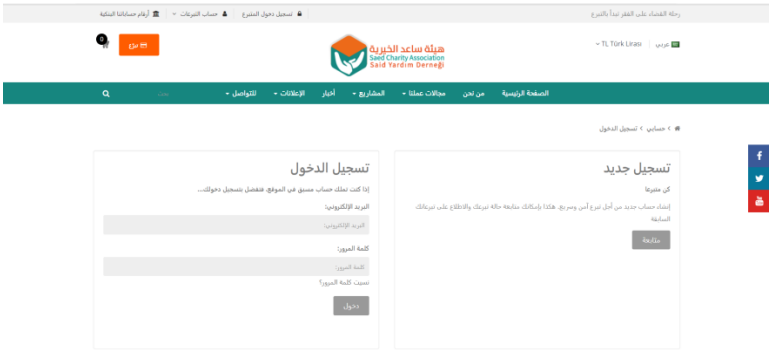

Figure 2.3.7: Saed Charity Association Website.

2.3.10 Al-Ihssan Charitable Society

Al-Ihssan Association, through its pioneering vision of charitable work in the United Arab Emirates, seeks to achieve the principle of solidarity among the segments of society and has set in mind

specific goals and a comprehensive plan and clear visions based on the provision of aid and helping poor and needy families within the country. [12]

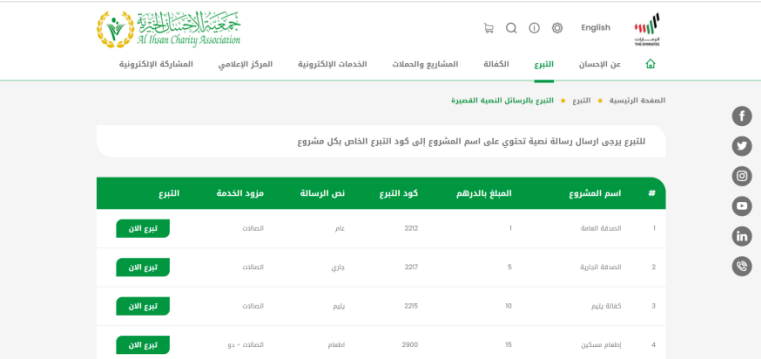

Figure 2.3.8: Al Ihssan Charitable Society Website.

- **Comprehensives Study**

Apps	Registration & Sign in	Easy to use	Diversity of donations	GPS
Fayid	Not Exist	Easy	Exist	Exist
Khair	Not Exist	Normal	Not Exist	Not Exist
E.Oman	Not Exist	Normal	Not Exist	Not Exist
Ikhair	Exist	Easy	Not Exist	Not Exist
Khair Plus	Not Exist	Easy	Not Exist	Not Exist

Table 2.3.1: Comprehensives Study.

2.4 Summary

It became clear from the previous table that most of the applications specialized in providing donations were limited to financial donations only, unlike what the applicable application will provide, which will provide a wide variety of forms of donation, in addition to many advantages (such as GPS) that will facilitate the donation process for the donor and the Foundation Charity.

Chapter 3
PROJECT METHODOLOGY

3.1 Introduction

The purpose of this study is to plan and test the implementation of Ehsan. To accomplish the previously stated aims, this chapter sets up a research approach. Besides, as described in Chapter One, checking and validating the proposed strategy as well as evaluating the efficiency of the Ehsan application are essential tasks to be accomplished. It takes a clear approach to attain these aims, and this is the focal point of this chapter. This thesis uses the Architecture Analysis Approach (DRM) for this reason and implements its key phases according to the phenomenon of this research. To present the intent of the chapter.

Donations are considered a vital role in alleviating the suffering of the needy, hence the need to provide donors with an application that helps them facilitate the donation process in a smooth manner that saves them time and effort, in terms of the time required to search for those who are eligible for these donations without falling into the usual mistakes that many donors face, represented in Fraud and fraud, in addition to reducing the effort spent in transferring these donations to the competent authority for distribution.

Through our application, we will meet their needs when searching for an application that provides them with many features, which will reduce the burden on them, such as a list showing them the many forms of donations that they can donate, in addition to a list containing all the bodies responsible for collecting donations (foundations) Governmental, charitable societies) include all the needs of these entities through an illustrative description of what these entities can use in terms of donations so that it becomes easy for donors to determine the party they want to donate to. Or the charitable institution, and on the contrary, with regard to the organization, this map will locate the donor in order to facilitate the process of reaching him.

3.2 Gantt Chart

Gantt chart, which is commonly used in project management, is a type of bar chart that shows the project schedule; Gantt charts show start and end dates for goals and summarize project components; To the left of the diagram there is a list of activities and along the top, there is a table corresponding to the list of activities; Each activity is represented by a bar so that the position and length of the bar reflect the beginning, duration, and end of the activity.

This graph helps us remember the following:

- Start and end times for each stage.
- What are the different activities that we want?
- Expected time to complete a specific task; where activities or tasks are mixed with similar tasks.
- Time from start to finish.

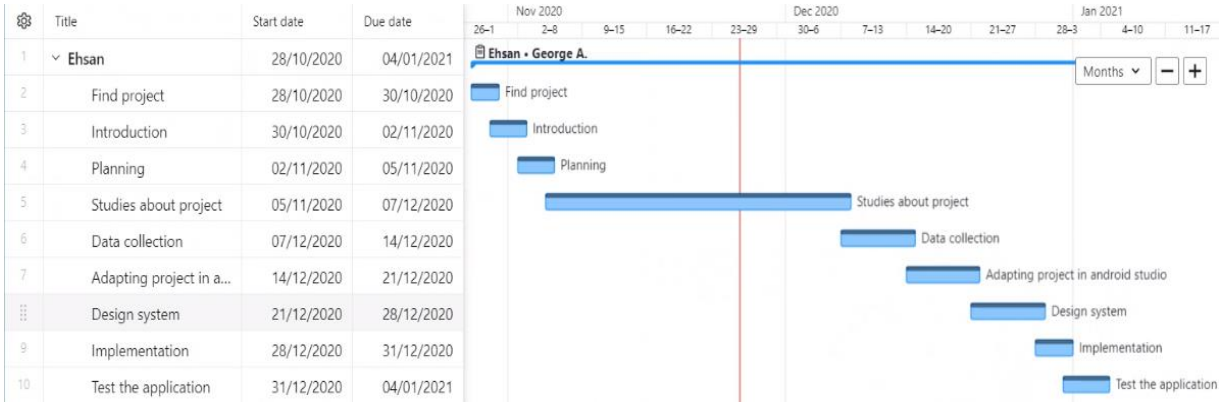

Figure 3.2: Gantt Chart of the System.

3.2.1 Research Approach

The key goal of this research is to establish an ICN content positioning and eviction policy to optimize the overall caching efficiency in terms of bandwidth and memory use. While this is a daunting challenge to map the current caching schemes to the new one leading to an effective and optimal solution, these criteria, however, are consistent with the concept of design research as suggested by Blessing [13], where' design research incorporates the production of understanding and protocol.' These features complement each other to deliver an effective and productive.

According to Blessing [13], to achieve satisfactory findings in both theoretical and functional terms, architecture analysis must be scientific, so it requires a special approach with its unique characteristics. He suggested a strategy called Concept Analysis Methodology for this purpose (DRM). DRM aims to make design analysis more accurate and economical, so it has been embraced for this thesis to be carried out. In the following four steps, DRM can be classified:

- Research Clarification (RC).
- Descriptive Study-I (DS-I).
- Prescriptive Study (PS).
- Descriptive Study-II (DS-II).

In the following pages, a short overview of DRM phases from the viewpoint of this research field is provided. Figure 3.2.1 displays the DRM system where the connections between the phases of DRM, the methods used at each stage, and the key deliverables are shown [14]. Light arrows between the phases represent the main flow of the operation, while the bold arrows to/from each step show methods used and deliverables of that individual phase.

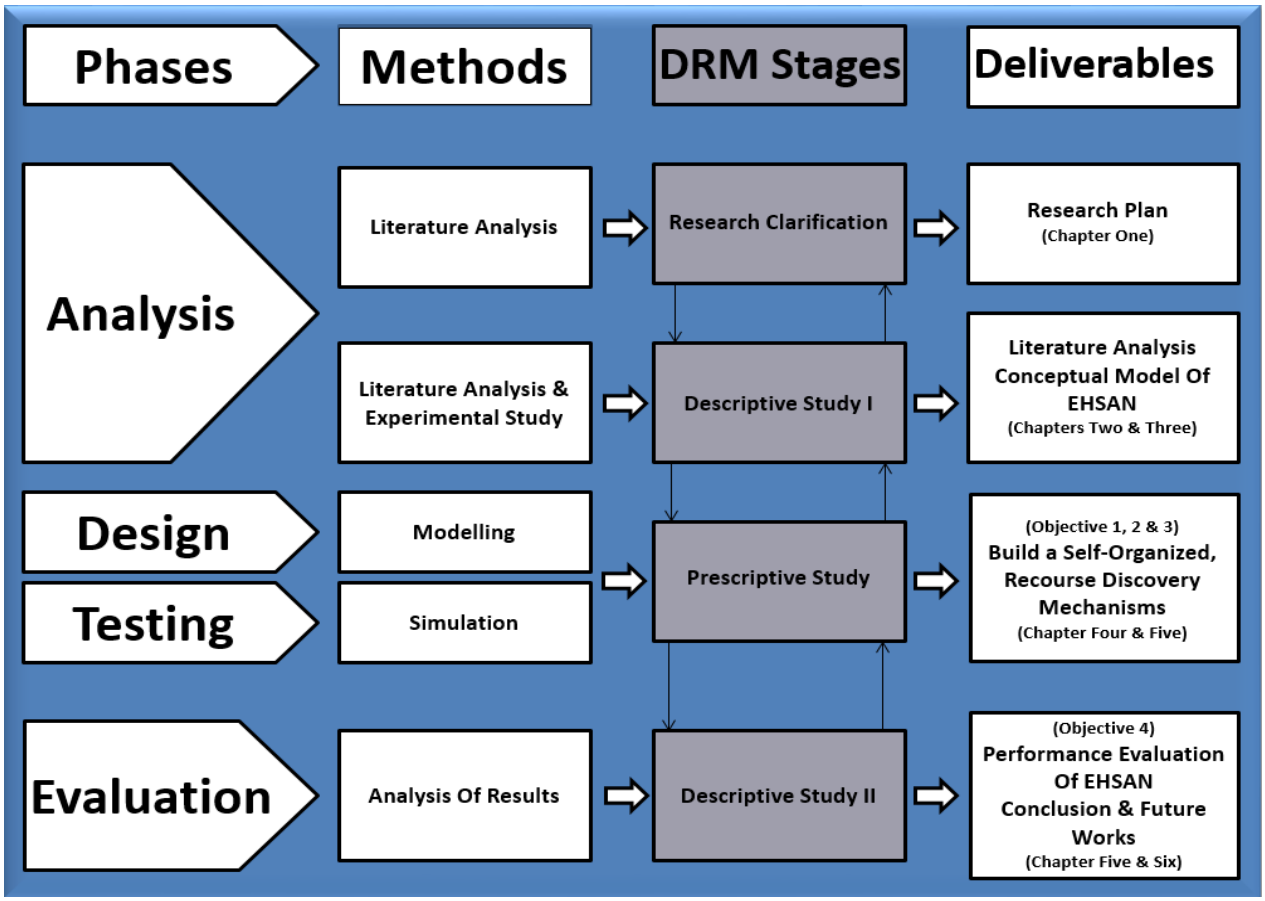

Figure 3.2.1: DRM Framework.

3.2.2 Research Clarification (RC)

The first stage of DRM is Research Confirmation (RC), which is used to gain basic information about the overall research program. As seen in Figure 3.2.2, (RC) requires six iterative steps.

In general, the (RC) stage deliverables are the overall study strategy consisting of the following points:

- The basis of research and its motivation.
- Research questions and research problems.
- Important areas to be addressed.
- Research approach.
- Area of contribution and deliverables.

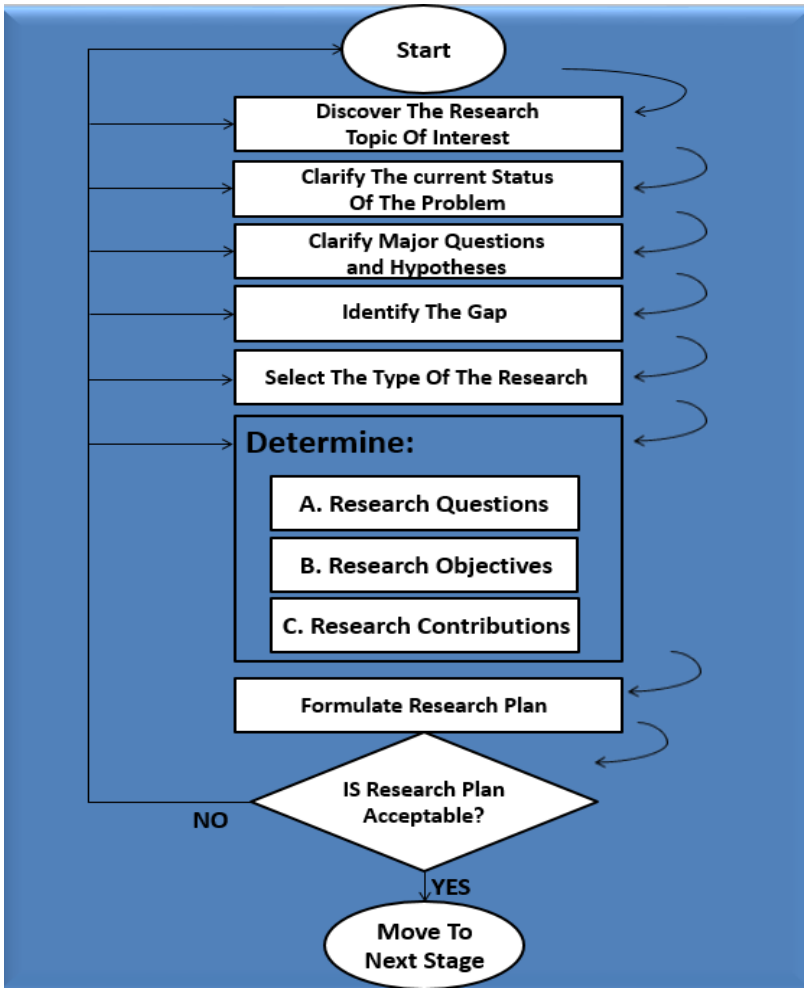

Figure 3.2.2: Research Clarification (RC).

3.2.3 Descriptive Study-I (DS-I)

DS-I is the second level of DRM, which is used to gain a deep understanding of the present situation. This stage entails a critical analysis of the research field's current work as well as observational studies. A thorough analysis of the latest ideas was addressed during the course of this study. To gain a deep understanding of the current systems, several observational experiments were also objectively examined. As shown in Figure 3.3.3, the DS-I involves five steps with several iterations, where each step aims to improve comprehension and can lead to more scientific

experiments or literature reviews that lead to the refinement and upgrading of performance and conceptual models.

The deliverables of DS-I stage are:

- Conducting a systematic review in Ehsan on cache control approaches.
- In order to understand the power and shortcomings of the algorithms, conduct an inclusive analysis on the algorithms in Ehsan and perform an experimental calculation. Also, to describe the study problems that should be taken into account during the review of Ehsan in Ehsan.

Figure 3.2.3: Descriptive Study-I (DS-I).

3.2.4 Prescriptive Study (PS)

The key stage in DRM is the Prescriptive Analysis (PS), as it involves the nature of the mechanisms proposed. Network modeling and simulation methods suggested by Guizani et al [15] have been pursued for the purposes of this study.

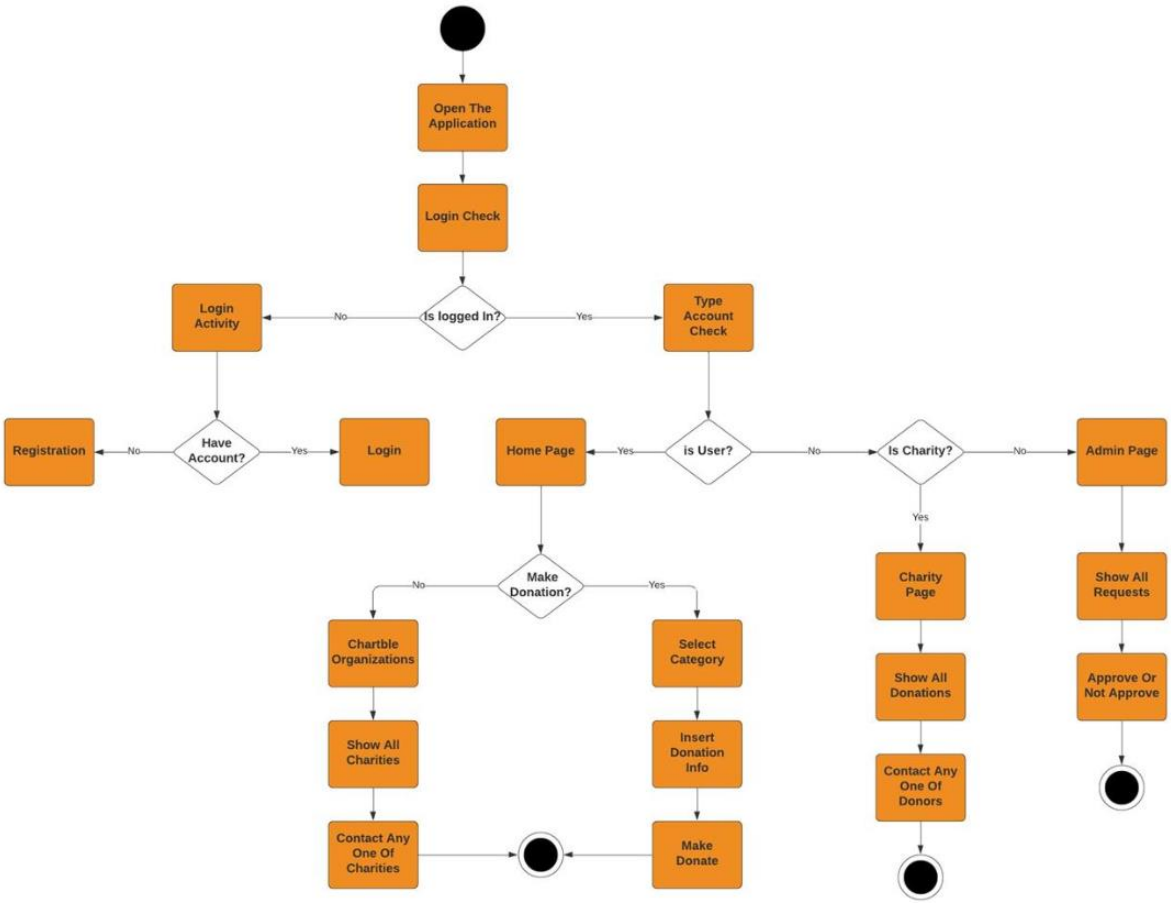

Figure 3.2.4: System Flow Chart.

3.2.5 Descriptive Study-II (DS-II)

This stage focuses on the assessment of the procedures and procedure designed. In assessing any analysis, performance assessment is the imperative step

3.2.6 Verification and Validation

Validation and verification are characterized as a method to validate the data's authenticity and internal integrity and to verify that it embodies real-world entities that are relevant to its intended purpose or number of objectives. Validation is the process, according to the modeling and simulation community, to assess the extent to which a concept, simulation, or mixture of prototype and simulation and its related data correctly reflects the real world from the point of view of its intended application.

While verification is the process of figuring out that a prototype, simulation, or mixture of prototype and simulation and its relevant data correctly represents the conceptual model and its explanation of the creator. Therefore, it is a step to ensure that the model implementations have correct assumptions. To ensure that the computational model is an accurate representation of the operating model, this means testing the simulation software.

3.3 Analysis of the new system

It is a study to determine the goals and actions effectively. It is also a problem- solving technology that divides the system into parts to examine the success of these parts and interact to achieve the desired goal. System analysis relates to requirements analysis, Figure (3.3).

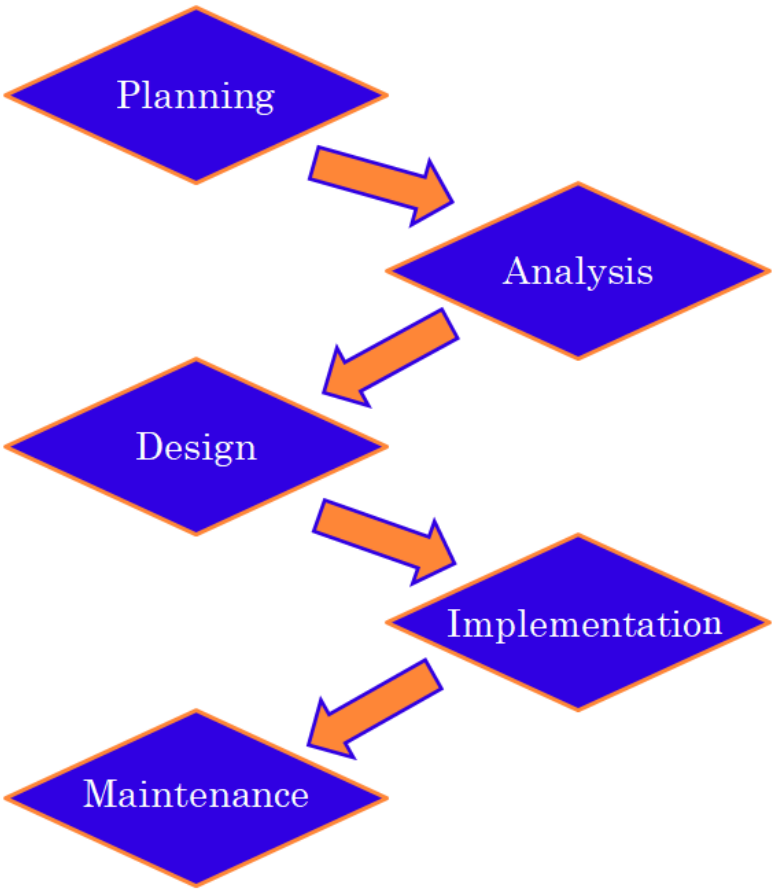

Figure 3.3: System Development Life Cycle (SDLC).

3.3.1 User requirements

3.3.1.1 Functional requirements

Actors in the application of Ehsan:

- **Admin:**

1. The Admin shall be able to login into the application by username, password.
2. The Admin shall be able to approve or reject the charities' requests.

- **Charity:**

1. The Charity shall be able to create an account with their personal information.
2. The Charity shall be able to login into the application by Email, password.
3. The charity can set a profile picture.
4. The Charity shall be able to display donations made & the donors who made them.
5. The Charity shall be able to the possibility of direct contact with the donor or sending him an e-mail, in addition to showing his location on the map.

- **Donor:**

1. The Donor shall be able to create an account with his personal information.
2. The Donor shall be able to login into the application by Email, password.
3. The Donor can set a profile picture.
4. The Donor shall be able to select the category he wants to donate by.
5. The Donor shall be able to make donations by selecting the items of the category.
6. The Donor shall be able to write a description of the donation.
7. The Donor shall be able to put his location on the map.
8. The Donor shall be able to select the charity.
9. The Donor can display all the charities, contact them, and see their location on the map.

3.3.1.2 Non-functional requirements

- **Availability:** The application's availability success rate shall be 100%.
  The application shall be available 24h/7d.
- **Performance:** The application shall take an advantage of concurrency which makes the application run faster.
- **Security:** The application shall be password protected.
  The cloud shall be able to authenticate the clients by using the authentication server.
- **Modifiability:** The application's components shall be able to be changed without breaking the whole application.
- **Usability:** The application's user-interface shall be intuitive.
  The application's user-interface shall use easy to read fonts.
- **Scalability:** The application shall be able to enlarge in features and handles increasing amount of workload.
  The application shall be able to enlarge in features in the upcoming future.

3.3.2 System Requirements

System requirements are the configuration that a system must-have for a hardware or software application to run smoothly and efficiently. Failure to meet these requirements can result in installation problems or performance problems. The former may prevent a device or application from getting installed, whereas the latter may cause a product to malfunction or perform below expectation or even to hang or crash.

- **Hardware Requirements**

The most common set of requirements defined by any operating system or software application is the physical computer resources, also known as hardware.

Computer Type	Lenovo
Computer CPU	Intel Core i7, 8th generation
Computer RAM	8GB
Computer Storage	Internal 1TB, External 265GB
User Device	Android OS, Version 4.2 or up

Table 3.3.2.1: Hardware Requirements.

- **Software Requirements**

The software requirements are a description of the features and functionalities of the target system. Requirements convey the expectations of users from the software product. The requirements can be obvious or hidden, known or unknown, expected or unexpected from a client's point of view. Software requirements are defined as follows: The conditions or capabilities the user needs to solve a problem or achieve a specific goal.

Conditions or capabilities of the software to make it compatible with the capabilities of the system to verify the contract and the characteristics agreed upon between the developer and the user.

Operating System	Windows 10
Target Program	Android Studio
Program Language	Java

Table 3.3.2.2: Software Requirements.

3.3.3 Domain Requirements

It is important because we really need a system to help people search for charities, to reduce the effort and time they spend searching, and this system provides users with an integrated environment that includes all charities and responsible bodies to reach an easy and flexible donation process that differs from its predecessors.

By:

1. Choosing the categories and items to donate.
2. Determine the location of the charity and the current location of the donors using maps.

As the application will achieve more accurate and efficient services if the user can handle the system efficiently.

3.4 Summary

The approach to ensuring the achievement of research goals has been comprehensively clarified in this chapter. Designing Ehsan is the subject of the study. Here, four key research practices were illustrated, in line with DRM. The first activity is the Study Clarification (RC) stage, which provides techniques to support the preliminary stage of this research. The purpose of RC is to categorize and solve a research issue, research questions, and priorities of both academic and realistic interest.

The second phase is the Informative Study-I (DS-I), which addresses measures to gain sufficient awareness of the current condition. This stage entails

both developing a reference model and proposing a hypothetical model. The Prescriptive Analysis (PS) is the third stage that focuses on strategies introduced in the design of the cache management strategy proposed. The last stage that addresses the assessment of the planned Ehsan is DS-II.

Chapter Four

Software Design and Implementation

4.1 Introduction:

This chapter will discuss in detail the design and implementation phases of the proposed project, including Android activities, interactions between activities, and database design, in addition to explaining the application life cycle, activity flow, system actors, and their responsibilities.

4.2 Overall System:

System components fall into two categories: hardware components and software components.

The hardware component includes:

- **Backend servers:** They are used to store the databases that will be shared between users, authenticate users, and connect users, and the administration system is built on these servers.

- **Mobile devices:** Donors and charities can access the backend of the system through an API and take advantage of its features from their mobile devices, and the mobile device must run on Android OS 4.3 or later.

The program components includes:

- **Database:** The system works on a Firebase database where the entities are not directly related to each other, but rather the structure depends on documents, as the entities can be merged and have different structures without dismantling the system.

This can boost system performance because the database requires one query most of the time without joining the tables.

- **Web server:** The system runs on the infrastructure of the google cloud platform (GCP) in short, this is critical and fits well with the needs of the system due to automatic scalability, as GCP automatically creates a new server in case the system increases users and balances the traffic between the server instances.

- **Android OS:** Android is the leading operating system in the market due to its popularity, ease of use, and the number of devices running on its basis, which gave the operating system the advantage of targeting the system instead of other operating systems, in addition to that it has a relatively easier learning curve.

The system consists of three possible user types and a privileged (admin) user. User types share many functions of the system, but each user type has its permissions and functions in particular, except for the super user, who has full privileges to do anything.

These types of users are:

- **Donors:** They can specify the category and type of donation and put a detailed explanation of the donation in addition to specifying their locations and determining the association to which they want to donate.

- **Charities:** they can receive donations from donors, communicate with them directly, and reach them through the site that the donors have previously determined.

- **Admin:** He has the ultimate authority to accept affiliation requests for charitable societies after reviewing their identity papers with the Ministry of Social Development or rejecting them in case the association does not possess any identity papers.

The figure below shows the activities for each user type, the abstract flow of the system, and how the components interact with each other.

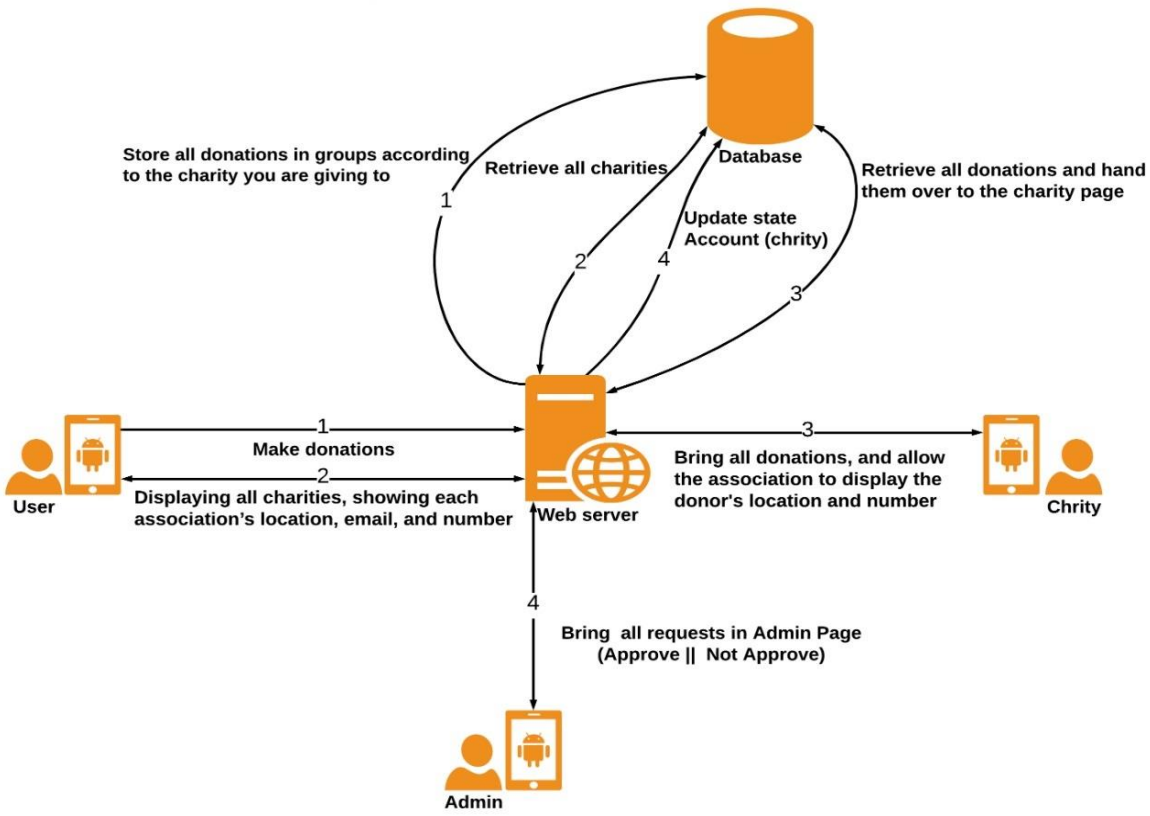

Figure 4.2: Overall System.

This was a summary of the system components, in the following sections, you can find a detailed description of each component and its functions, as well as a diagram that shows the life cycle of the system and the system flow in each step, including use case diagrams, sequence diagrams, class diagrams, database design, flow diagram and more.

4.3 Design Of Database

One of our goals was to build a robust and extensible database design to achieve our goal of building a resilient and maintainable project, thus, the database design follows a structure in which the data is normalized to achieve minimal redundancy. Figure 4.3 shows the Relational Schema:

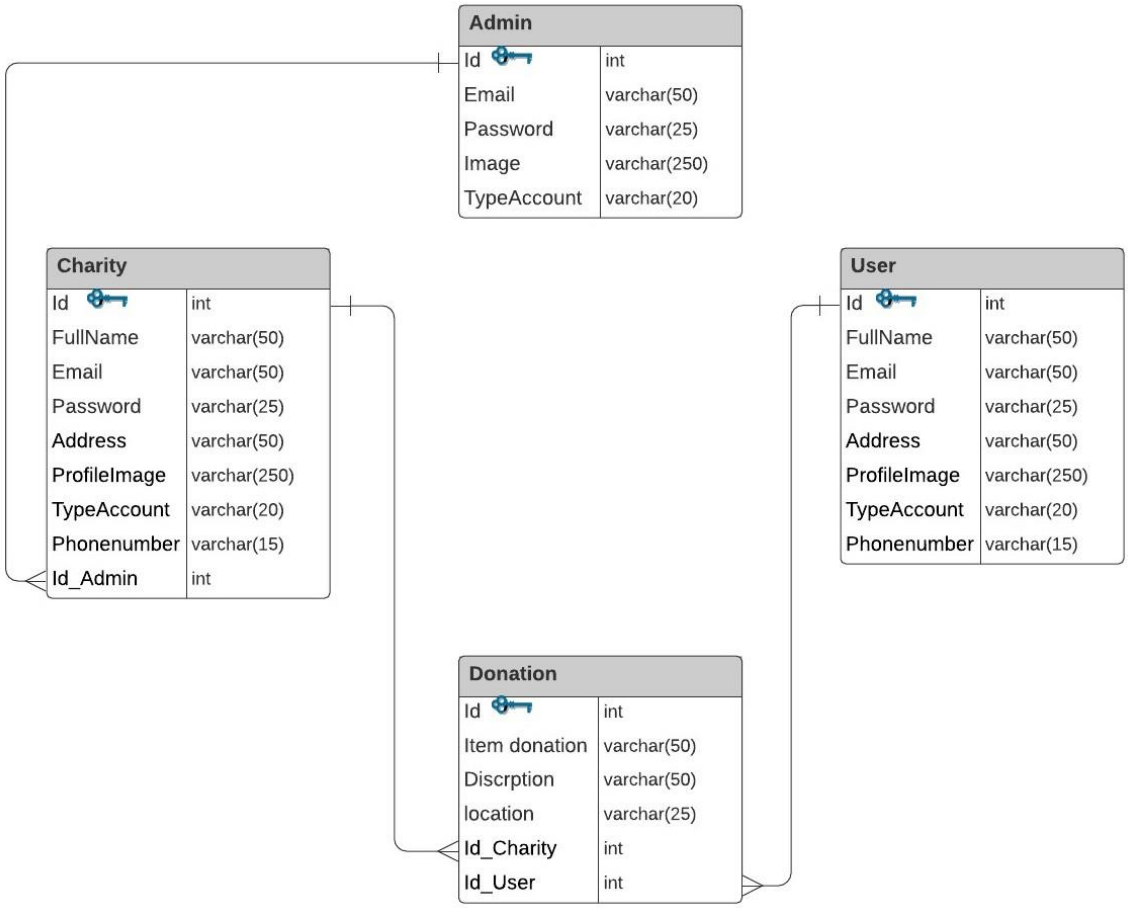

Figure 4.3: Relational Schema.

4.4 Use Case Diagrams

Use cases are a simple and effective way to express the functional requirements of a system. It describes how users can use the system and what the system can do for users. The system has three types for end-users: moderator, charity, and donor; Relationships between end-users as well as use cases are illustrated in the figures below:

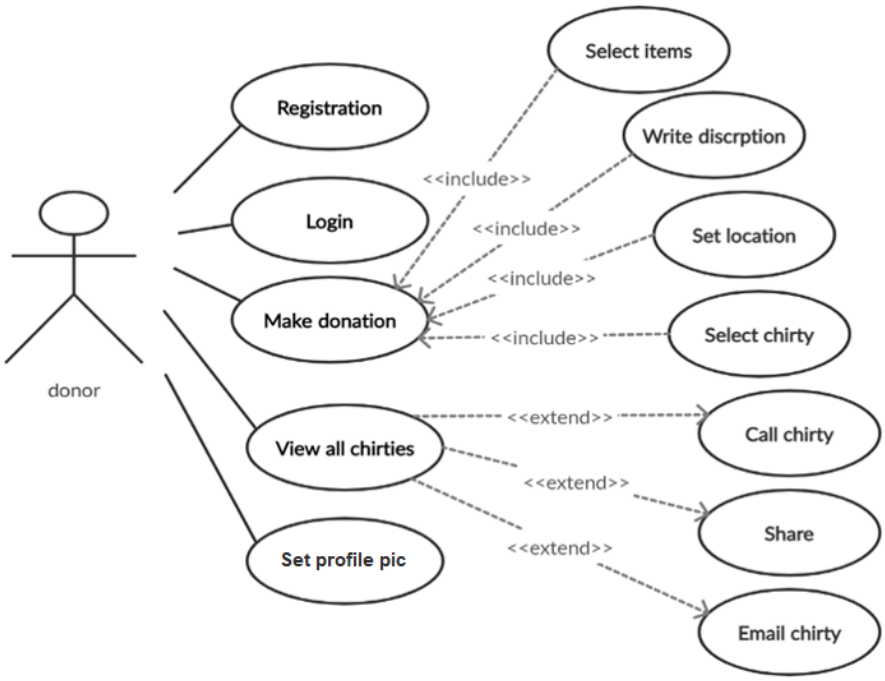

Figure 4.4.1: Donor Use Case Diagram.

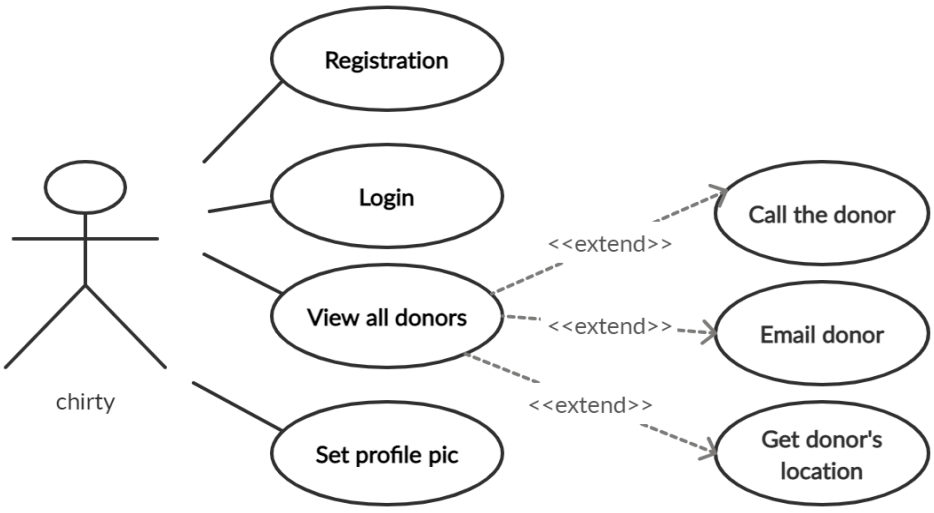

Figure 4.4.2: Charity Use Case Diagram.

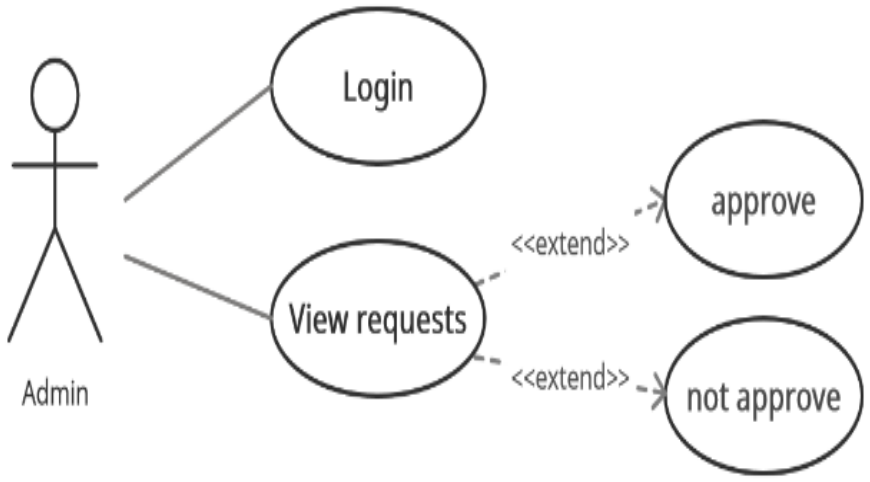

Figure 4.4.3: Admin Use Case Diagram.

- **Use Case Specification:**

  The activities needed to enable a target are defined by a use case, a case of usage has several "paths" that can be followed at any time by any user, a example of a use case is a single direction through the use case.

Use Case:	Create Account.
Actor(s):	Users.
Summary Description:	Allows users to create account on the system.
Pre-condition:	1-The user must have valid and effective mobile phone number. 2- The user must have good internet connection.
Post-Conditions:	1-The user already has a registered account. 2-User's data saved in the database.
Alternative Paths:	1-The user leaves at least one field empty. 2-The user typing a non-valid character in one or more fields. 3- The user chooses a password that is less than 6 characters.
Basis Path:	1-The user must enter his personal information. 2-The user should choose a memorable password.

Table 4.4.1: Use Case For Create Account.

Use Case:	Login.
Actor(s):	User.
Summary Description:	Allows users to login the system.
Pre-condition:	1. The user has a registered account. 2. The user must have good internet connection.
Post-Conditions:	The client application will be authorized to send and receive back-end calls.
Alternative Paths:	1. The user leaves at least one field empty. 2. The user enters an incorrect password. 3. The user enters an incorrect username. 4. The user did not submit his inputs by clicking the login button. 5. The application can't communicate with the back-end. 6. The application connection gets interrupted while processing the login request.
Basis Path:	1. The user enters his login credentials. 2. The user submits and attempts to log on by clicking the login button.

Table 4.4.2: Use Case For Login.

Use Case:	Make Donation.
Actor(s):	User (Donor).
Summary Description:	Donors are allowed to choose the donation category by pressing the button for that category.
Pre-condition:	1. The user must be logged into the application. 2. The user must have good internet connection.
Post-Conditions:	A new screen (Activity) will appear to enter all donation information.
Alternative Paths:	1. The user didn't select the items from the selected category. 2. The user didn't fill in the description. 3. The user didn't put his location or he couldn't locate it accurately. 4. The user didn't choose one of the charities. 5. The user didn't click on the button (Make Donation).
Basis Path:	The user must select the category.

Table 4.4.3: Use Case For Make Donation (Donor).

Use Case:	Show All Donations.
Actor(s):	User (Charity).
Summary Description:	Charities Are allowed to show all donations.
Pre-condition:	1. The Charity must be logged into the application. 2. The user must have good internet connection.
Post-Conditions:	A list of all donations made to this charity will appear.
Alternative Paths:	None.
Basis Path:	The charity must have at least one donation process or more.

Table 4.4.4: Use Case For Show All Donations (Charity).

Use Case:	Show All Charities Requests.
Actor(s):	Admin.
Summary Description:	Admin is allowed to show all charities requests.
Pre-condition:	3. The Admin must be logged into the application. 4. The Admin must have a good internet connection.
Post-Conditions:	A list of all charities requests will appear.
Alternative Paths:	None.
Basis Path:	The admin must have at least one charity request or more.

Table 4.4.5: Use Case For Show All Charities Requests (Admin).

4.5 Class Diagram

A class diagram is a type of static topology diagram that explains the structure of a system by showing the classes of a system, their properties, their processes, and the relationships between objects. The figure below represents the relationship between the classes and gives an overview of how they work together:

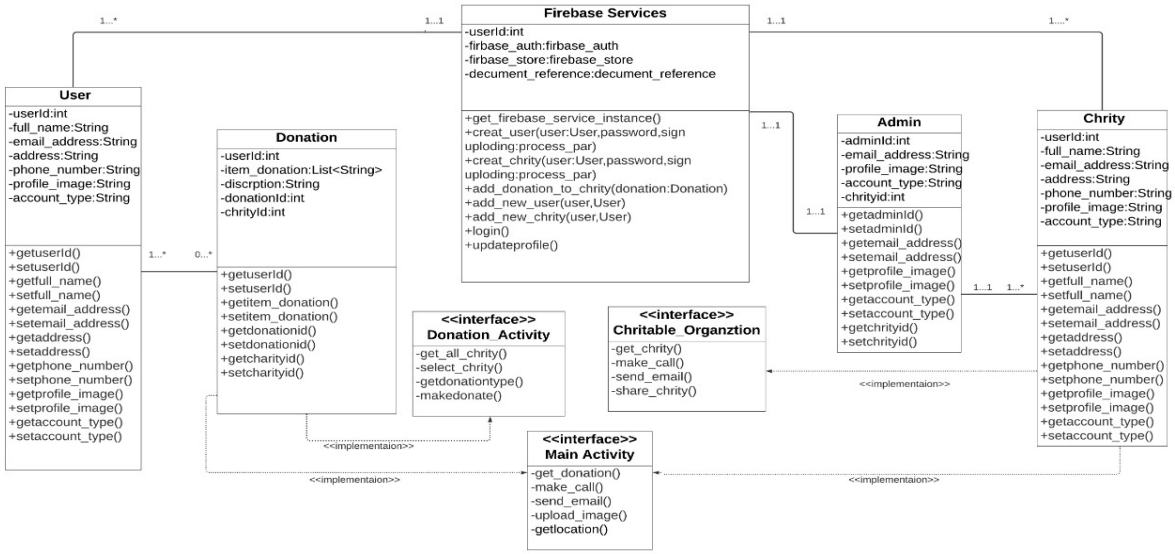

Figure 4.5: Class Diagram.

4.6 Sequence Diagram

The sequence diagram will help us explain what happens under the hood after the user interacts with the app at each point.

4.6.1 Registration Sequence Diagram:

In the registration process, the user provides his personal information which includes the full name, password, mobile phone number and location, and this information will be sent to the back end and used to create the new account that will be linked to this after we store this data and create the account, we will notify the user whether The account has been created successfully, or something went wrong during the registration process such as an incorrect entry.

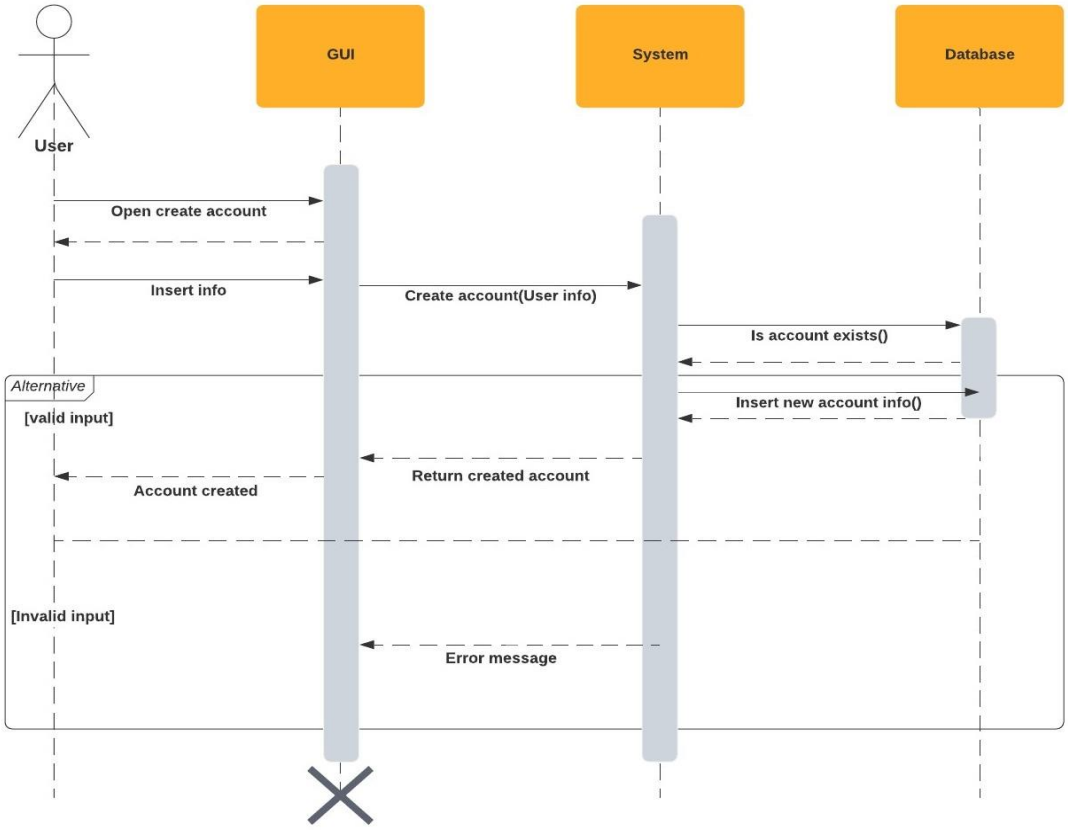

Figure 4.6.1: Create Account Sequence Diagram.

4.6.2 Login Sequence Diagram:

The login process is fairly simple, the user enters his credentials, and the system will check whether the entered credentials are in the database, otherwise, it will inform the user if the entered credentials are wrong.

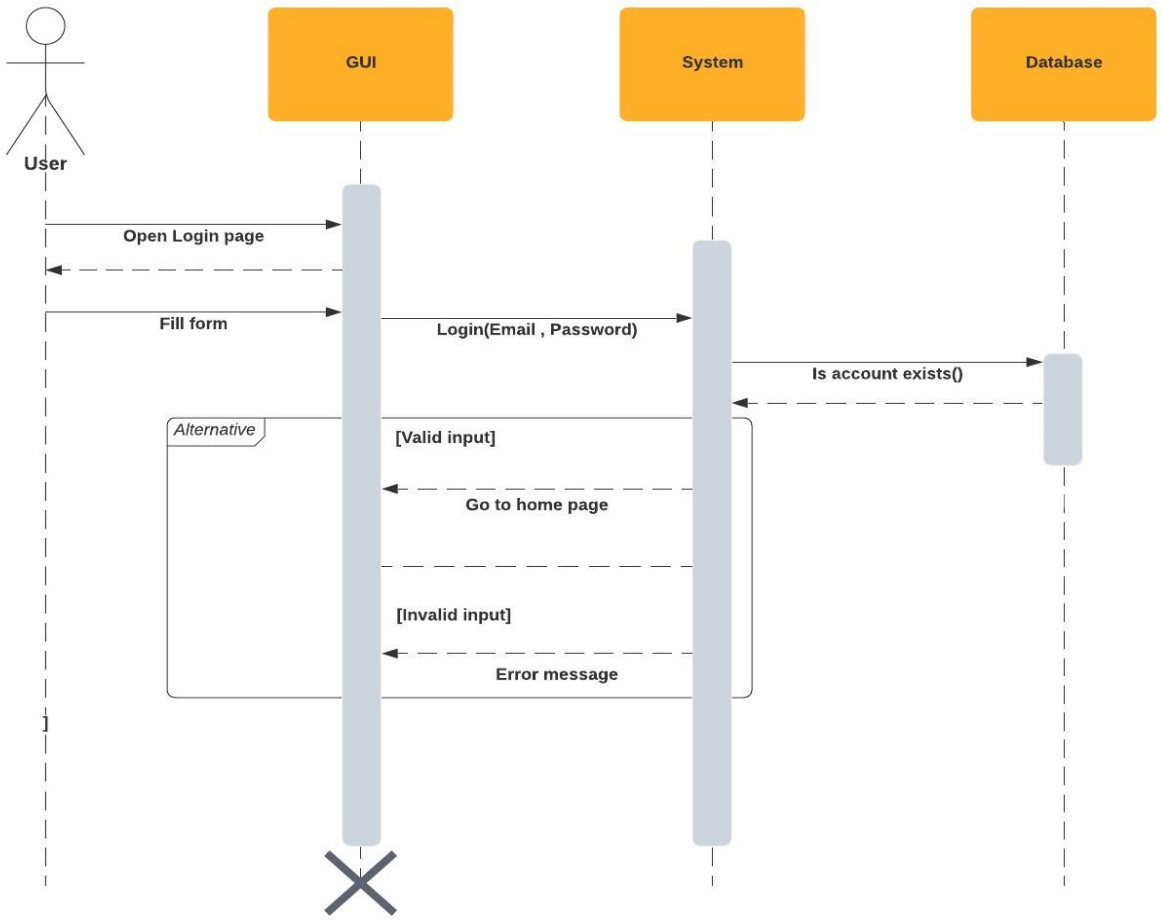

Figure 4.6.2: Login User Sequence Diagram.

4.6.3 Login Admin Sequence Diagram:

The admin enters his credentials, and the system will verify whether the entered credentials match the credentials of the admin account information in the database, otherwise, the admin will be informed if the entered credentials are wrong.

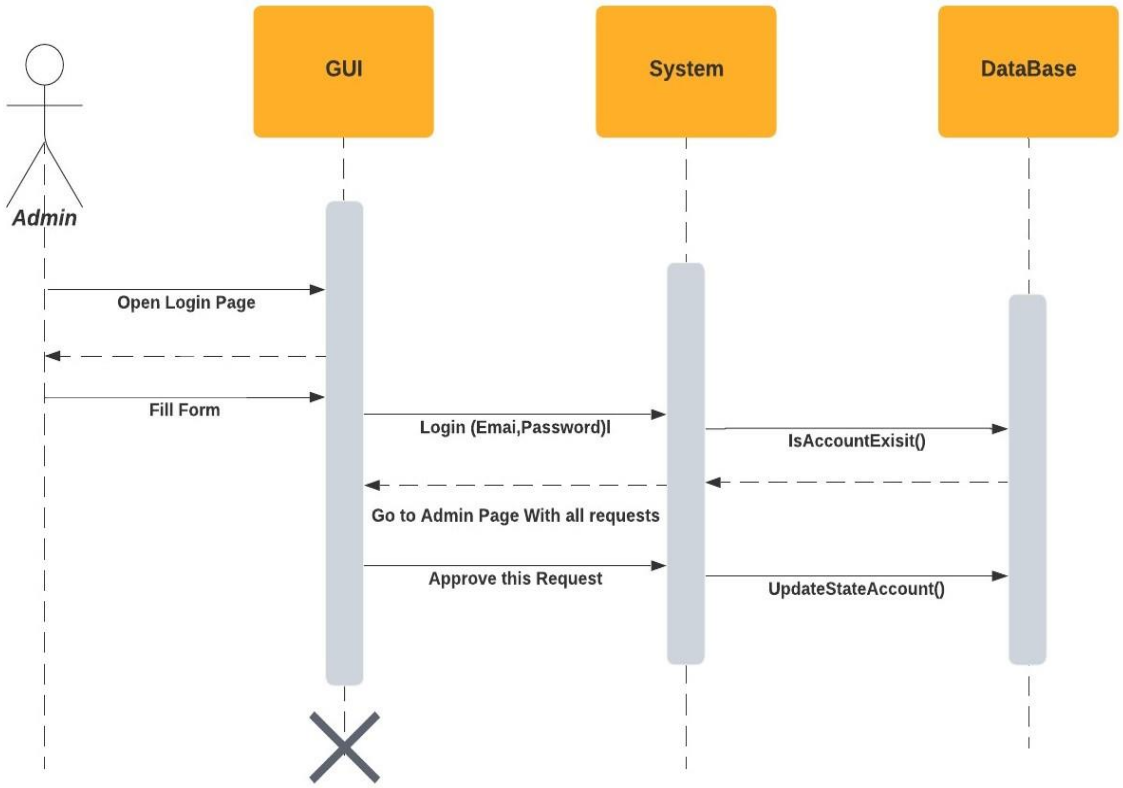

Figure 4.6.3: Login Admin Sequence Diagram.

4.6.4 Home Page Donation Sequence Diagram:

The donor determines the required category, then selects the items he wants to donate, then writes an explanation of the type he donated, then determines his current location on the map, and finally chooses the charity to which he wants to donate.

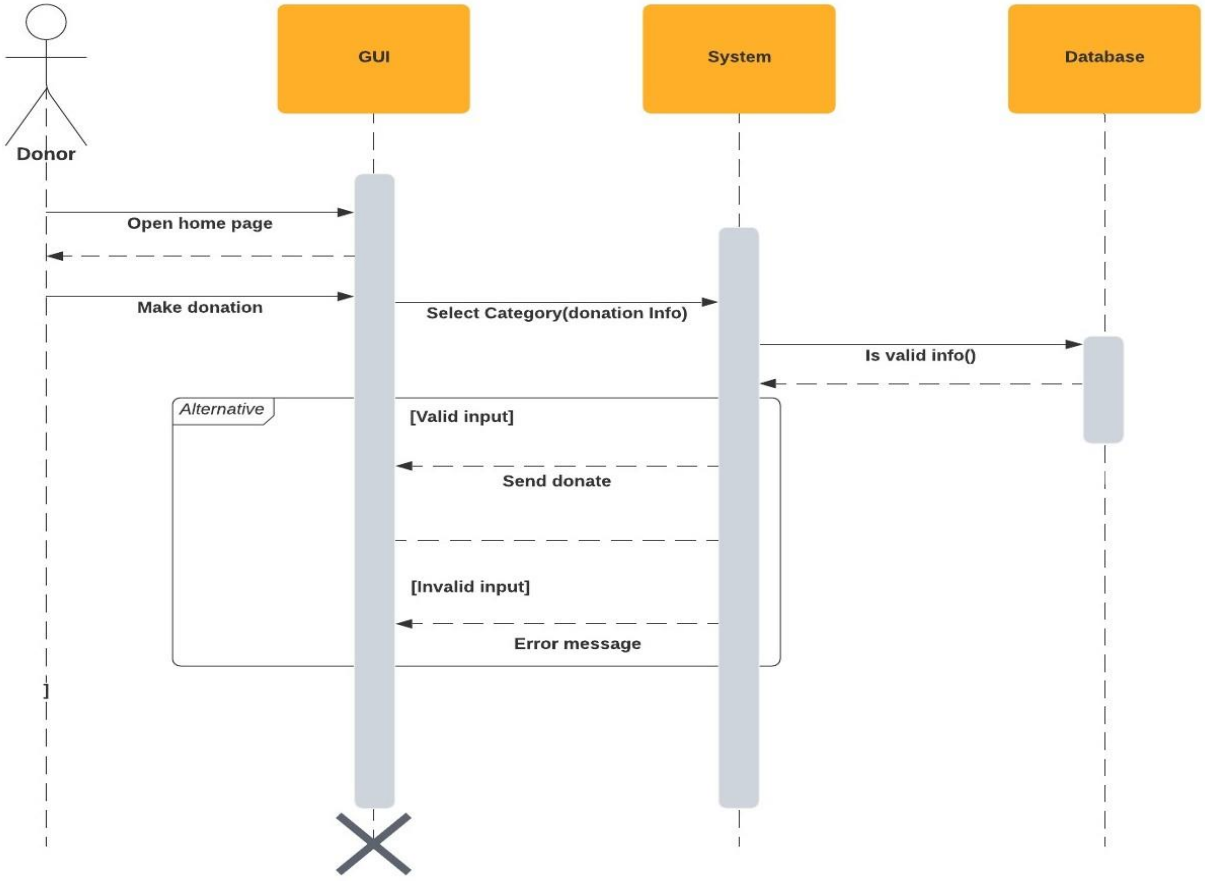

Figure 4.6.4: Homepage Donation Sequence Diagram.

4.6.5 Home Page Charity Sequence Diagram:

The charities page displays all the donations made to this charity exclusively from other charities, so that the charity is allowed to communicate directly with any of the donors, either by phone or e-mail, with the ability to see the current location of the donor on the map. It is worth noting that the charity can reject any donation by removing it from the list of donations.

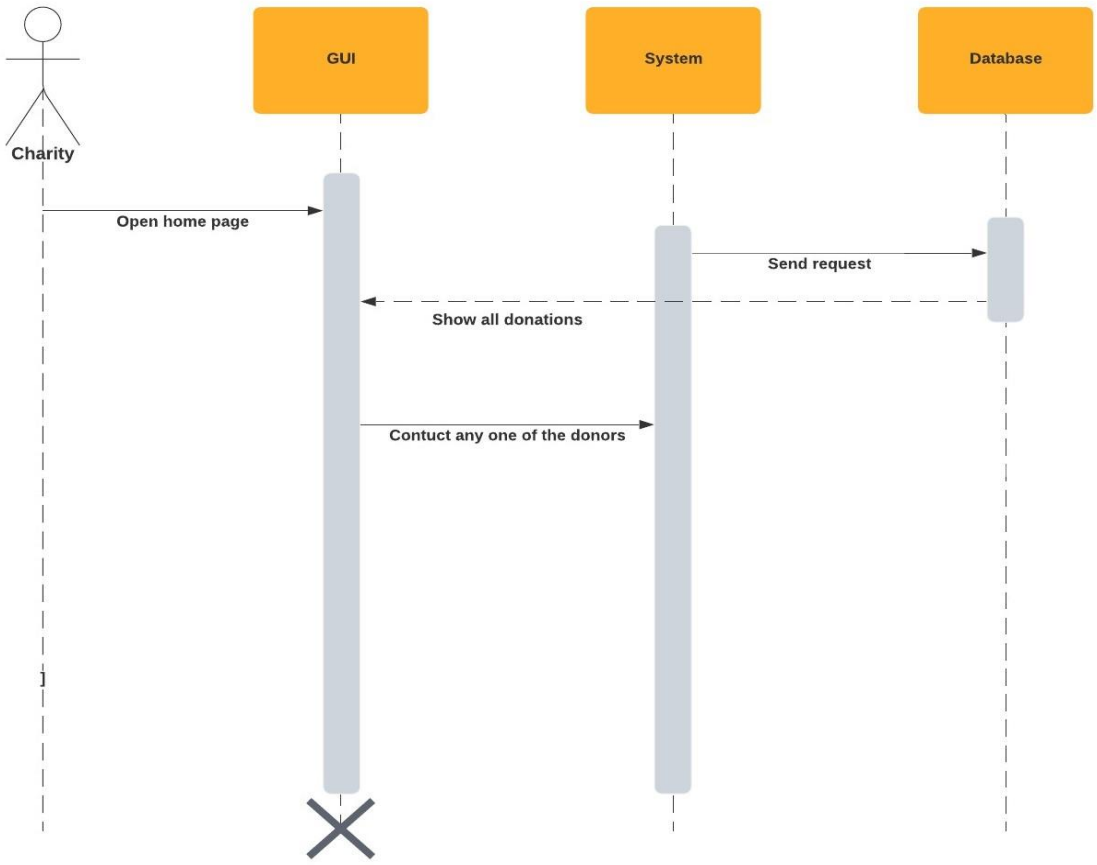

Figure 4.6.5: Home page Charity Sequence Diagram.

4.7 Flow Chart Diagram

Activity diagram is used to show overall system behavior, and to describe the flow from one activity to another. This section will discuss in detail how activities interact with each other during the application life cycle.

4.7.1 Splash Screen Flow Chart Diagram

This is the login screen for the application, this screen is non-interactive and does not provide any data for the user, we use it to retrieve the necessary data in advance and download the user's status from the database to check whether he has logged in or not. When everything has loaded, the app automatically moves to the next screen.

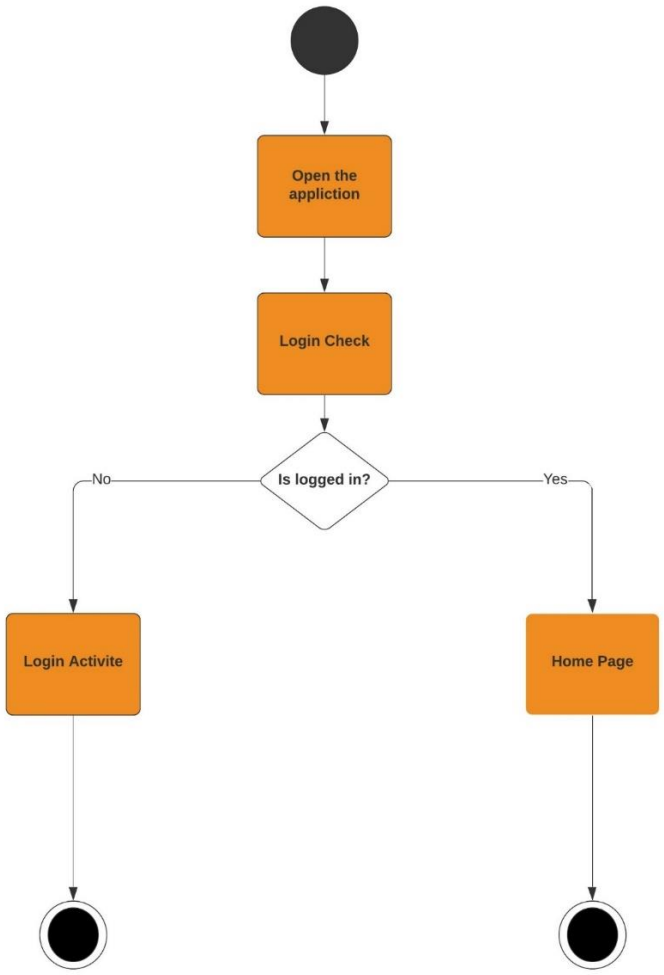

Figure 4.7.1: Splash Screen Flow Chart Diagram.

4.7.2 Create Account Flow Chart Diagram

When the user launches the application for the first time, he must create an account and provide his personal information which includes the full name, password, mobile phone number, and location. If this data is acceptable and not identical to an account that was previously created, the account will be successfully created and its data saved in the database, but if there is an error, the user will be returned to the account creation page after showing an error message when entering the data.

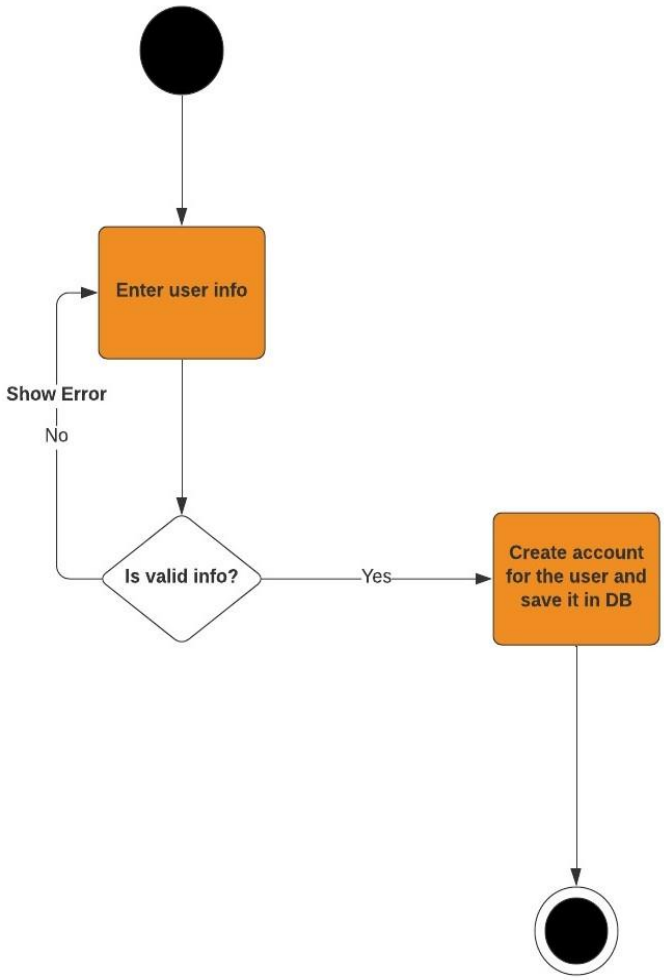

Figure 4.7.2: Create Account Flow Chart Diagram.

4.7.3 Login Flow Chart Diagram

This activity is responsible for authorizing application users by entering their credentials and sending them securely to our backend to match it against the saved credentials, if the user does not already have an account, they can create a new one.

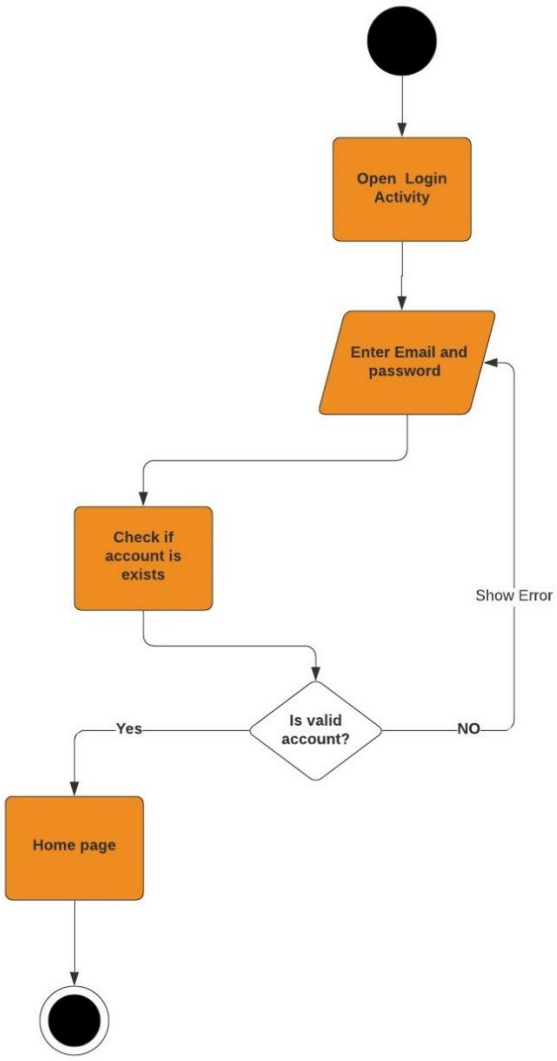

Figure 4.7.3: Login Flow Chart Diagram.

4.7.4 Home Page Donor Flow Chart Diagram

This activity is responsible for allowing application users (Donors) to submit donations by specifying the category to be donated to be taken to the next page to fill in the donation information (items, description, location, and charity to donate to). And save the data in the database, otherwise, the application will show the error to the user.

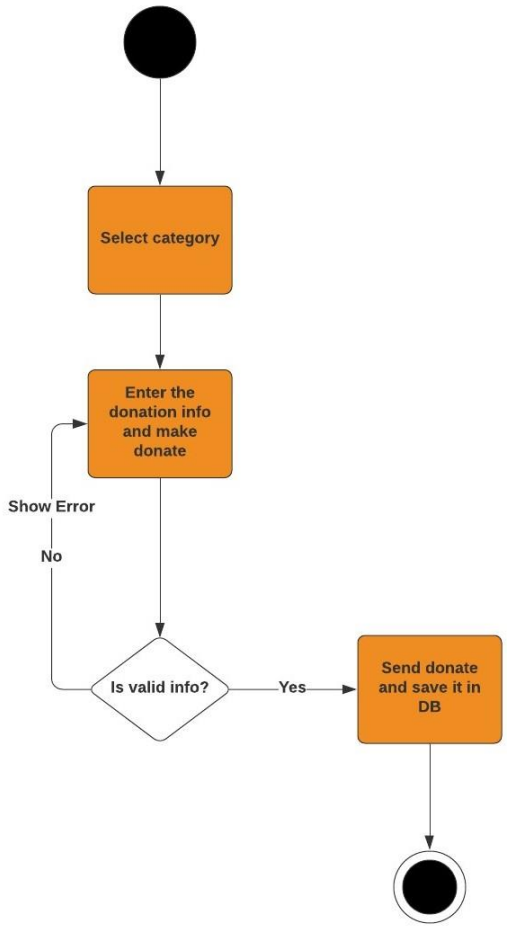

Figure 4.7.4: Home Page Donor Flow Chart Diagram.

4.7.5 Home Page Charity Flow Chart Diagram

This activity is responsible for allowing application users (Charities) to view all donations made to this charity only; Then the charity can directly contact the donor by phone number or email and show his current location, and the charity can refuse the donation by clicking on the delete button.

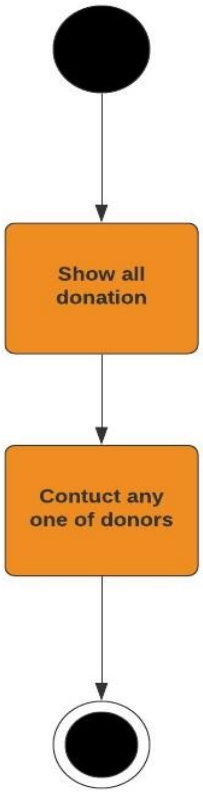

Figure 4.7.5: Home Page Charity Flow Chart Diagram.

4.7.6 Home Page Admin Flow Chart Diagram

This activity is responsible for allowing the application admin to view all join applications submitted by charities; Then the supervisor can accept the request after confirming the validity of this charity, to be presented later to the donors within the list of charities, otherwise the request will be rejected if the charity is not government-certified.

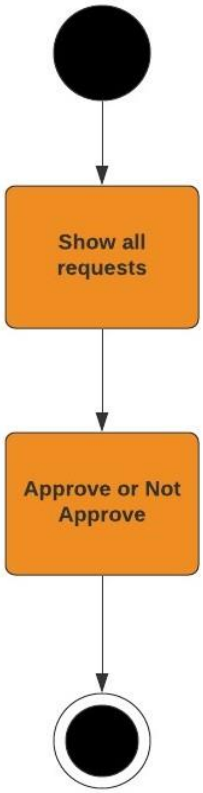

Figure 4.7.6: Home Page Admin Flow Chart Diagram.

4.8 Implementation

In this phase, we'll explain how the project will take shape, including building the actual project outcome, and how we participate programmatically in coding, and in developing graphic materials visually.

At the end of the implementation stage, the result is evaluated according to the list of requirements created in the definition stage.

The components used to implement the application:

The prototype of the tool is an Android app implemented with programmatic commands using Android Studio, which is Google's official integrated development environment (IDE) for Android.

This program is designed to develop android applications using the used Java programming language. Implementation includes the use of our code and interfaces.

When a new user enters the application, the user becomes inside the application and is authorized to use it. The portable user interface (MUI) is the graphic screen and is usually touch-sensitive on a mobile device, such as a smartphone or tablet, which allows the user to interact with the device's applications, features, contents, and functions.

The application is installed on the phone from the Google store for both the admin and the users (Donors and Charities) and each of them has its user interface as that saves time and effort for each user of the application.

Chapter Five
Results and Discussion

5.1 Introduction

This chapter illustrates the results of the system developed and proposed by pictures from the actual application, Along with a comparison with the related applications.

5.2 Results

5.2.1 Expected Results

In this app, I was interested in developing an Android app that makes searching for charities easier and faster. The main idea was to develop an app that is easy to use, efficient, and can be used at any time and without restrictions.

5.2.2 Actual Results

We created a database and tested the app to show actual results with users. We found that through the application, the donor can find charities and can view many charities registered in the application and communicate with them, in addition to that charities will be able to view all donations and communicate with donors.

5.2.2.1 Splash Screen

The splash screen appears when starting the application.

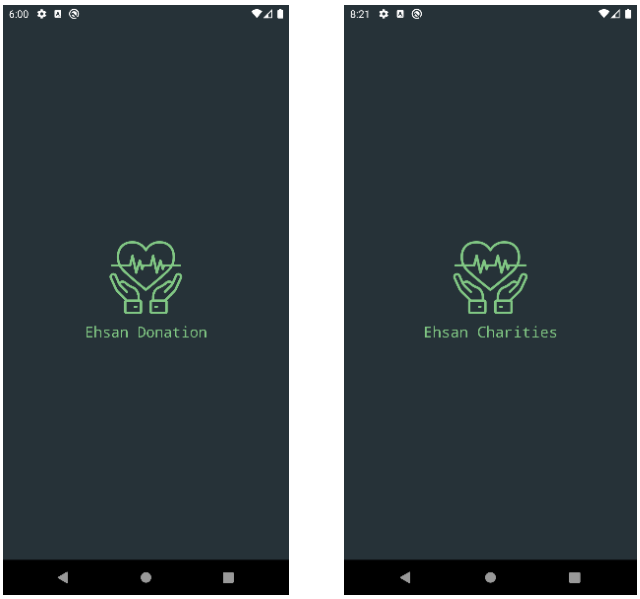

Figure 5.2.21: Splash Screen.

5.2.2.2 Login Screen

An existing user can log in to their account by entering their e-mail address and their password.

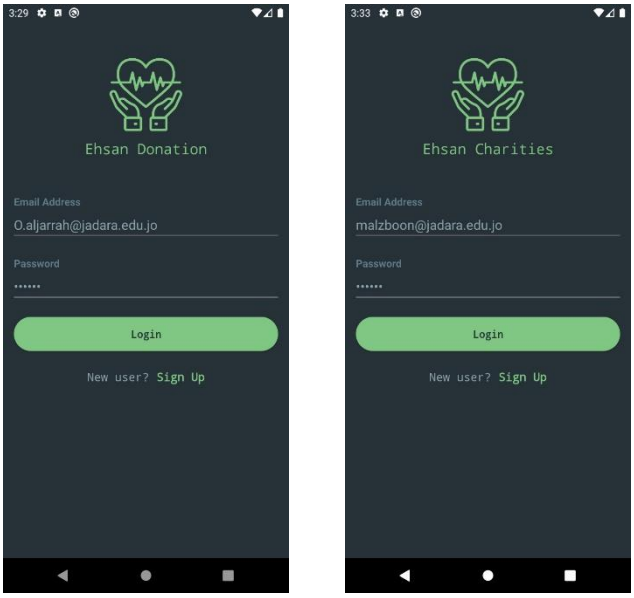

Figure 5.2.2.2: Login Screen.

5.2.2.3 Create Account Screen (User)

The account creation process depends on entering the full name, email, password, specifying the address, and phone number. After automatic verification of the entered information, the registration button is pressed to complete the process.

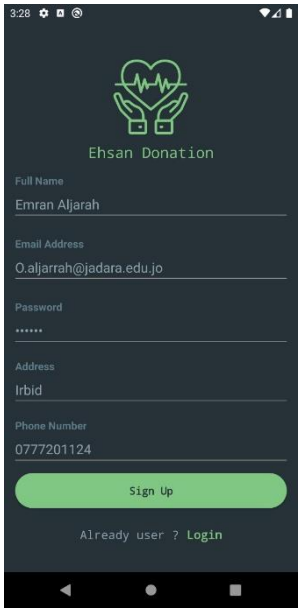

Figure 5.2.2.3: Create Account Screen (User).

5.2.2.4 Create Account Screen (Charity)

The account creation process depends on entering the charity's name, email, password, specifying the address, location on the map, and phone number. After automatic verification of the entered information, the registration button is pressed to complete the process.

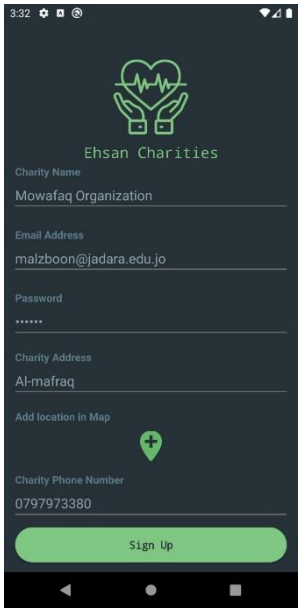

Figure 5.2.2.4: Create Account Screen (Charity).

5.2.2.5 Home Page Screen (User)

The donor can choose one of the categories in which he donates and then specifies the elements, description, and location, the charity to which he will donate. After automatic verification of the entered information, press the donation button to complete the process.

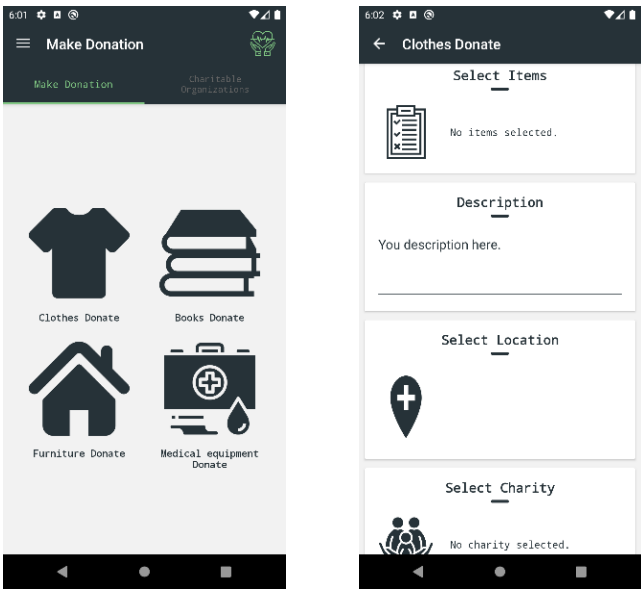

Figure 5.2.2.5: Home Page Screen (User).

5.2.2.6 Charitable Organizations Screen

On this screen, the user can view charities registered on the system and the ability to communicate with one of these charities.

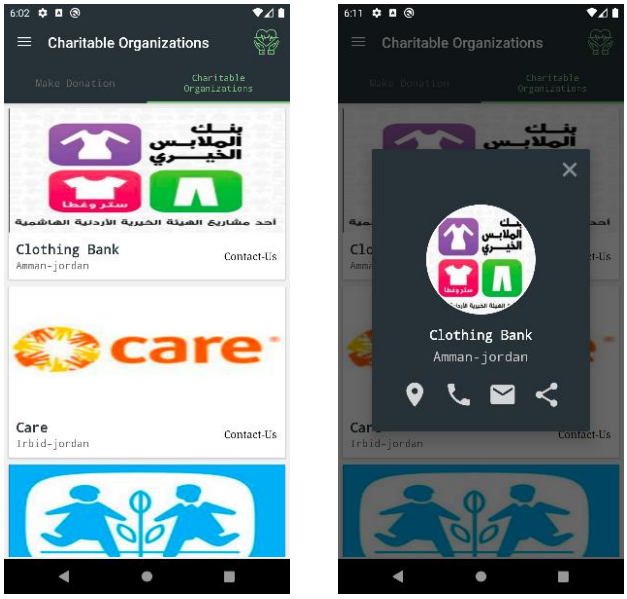

Figure 5.2.2.6: Charitable Organizations Screen (User).

5.2.2.7 Home Page Screen (Charity)

This screen displays all donations and donor information, and the charity can communicate with the donors using one of the available means, either by phone or email address and display the donors' location on the map.

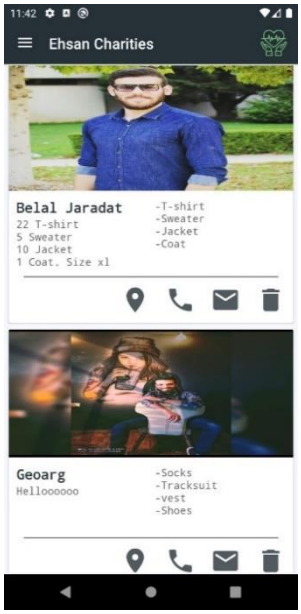

Figure 5.2.2.7: Home Page Screen (Charity).

5.2.2.8 Home Page Screen (Admin)

This screen displays all requests from charities that can be accepted or rejected in the system, based on specific conditions.

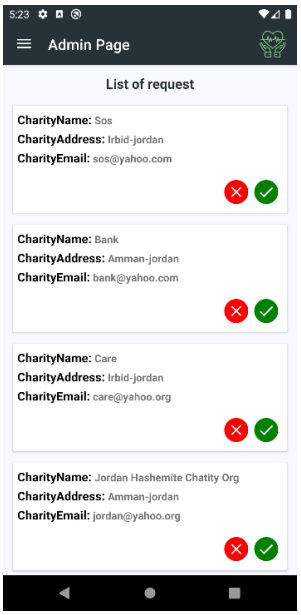

Figure 5.2.2.8: Home Page Screen (Admin).

5.2.2.9 Rate screen

After the user completes the donation process, this screen appears for evaluation purposes.

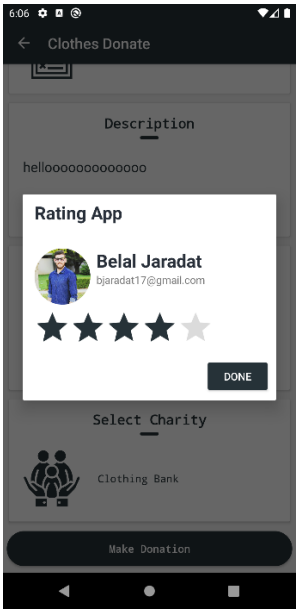

Figure 5.2.2.9: Rate Screen.

5.3 Discussion

Apps	Registration & Sign in	Easy to use	Diversity of donations	GPS
Ikhair	Exist	Easy	Not Exist	Not Exist
Khair	Not Exist	Normal	Not Exist	Not Exist
Khair Plus	Not Exist	Easy	Not Exist	Not Exist
E.Oman	Not Exist	Normal	Not Exist	Not Exist
Fayid	Not Exist	Easy	Exist	Exist
Ehsan	Exist	Easy	Exist	Exist

Table 5.3: Discussion.

Ikhair application differs from our application (Ehsan) in that it doesn't contain GPS and it also differs in that it doesn't contain a diversity of donations, this is characterized by our application that its design is more comfortable to use.

(Khair) application differs from our application (Ehsan) in that it does not contain a global positioning system (GPS) and also differs in that it does not contain a variety of donations, and our application is distinguished by its more user-friendly nature in addition to that (Khair) application does not contain registration and login, so it is easier to use our application (Ehsan) than (Khair).

The application (Khair Plus) differs from our application (Ehsan) in that it does not contain a global positioning system (GPS) and also differs in that it does not contain many different types of donations, and our application is distinguished by its more user-friendly nature, in addition to the fact that the application (Khair Plus) does not contain registration and login.

The (E.Oman) application differs from our (Ehsan) application in that it does not include a global positioning system (GPS) and also differs in that it does not contain a number of donations, and our application is distinguished by a more user-friendly nature in addition to that (E.Oman) application does not contain registration and login, because our (Ehsan) application is simpler to use than (E.Oman) application.

Fayid application differs from our application (Ehsan) in that the first application does not contain registration and login, unlike our application (Ehsan), and our application is characterized by its design that is more comfortable to use.

Chapter 6
Conclusion & Future Works

6.1Conclusion

Based on what was discussed in the first chapter of incentives that contributed to supporting the idea of the project, an application was created and developed that works on:

1. Contribute to providing a gateway to reach the target audience (donors / charities) by reducing time and effort.
2. Giving donors an opportunity to make a donation process that is distinct from previous traditional donation operations.
3. Limiting all government-documented charities to one application.
4. Create a channel linking donors with charities.
5. Promoting social work and charitable work in Jordan.

6.2 Future Works

Based on the above, the researchers recommend the following:

1. Developing the application to be able to send notifications to users.
2. Develop the app to contain additional donation categories; an example of a cash donation.
3. Developing another version of the application to serve other operating systems such as (IOS).
4. Developing a website version to allow the largest number of users to benefit from the application's services.
5. Improving the application so that it serves the Arabic language as well.

References:

[1] alijtihed, Charitable societies and ways to develop them (resources and objectives), access date: 27/9/2018.

[2] alrai, Some traditional work stopped because of coronavirus, access date: 28/8/2020.

[3] Fayid (Application), access date: 5/3/2017.

[4] Khair (Application), access date: 24/9/2018.

[5] Official Donations App (Oman) (Application), access date: 17/2/2019.

[6] IKhair (Application), access date: 30/6/2020.

[7] Khair Plus (Application), access date: 27/7/2020.

[8] tandfonline, Attitudes and Donation Behavior When Reading Positive and Negative Charity Appeals, access date: 2/4/2018.

[9] umsystem, Socially Responsible Consumer Behavior, access date: 26/11/2018.

[10] qcharity (Website), Qatar Charity Association: https://www.qcharity.org.

[11] saedcharity (Website), Saed Charity Association: https://www.saedcharity.org.

[12] alihsan (Website), Al Ihssan Charitable Society: https://www.alihsan.ae.

[13] link.springer, DRM: A Design Research Methodology, access date: 2009.

[14] designsociety, The Design Research Methodology as a Framework for the Development of a Tool for Engineering Design Education, access date: 2010.

[15] books.google, Network modeling and simulation, access date: 2010.