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Theme

Personal Family Social Network

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Abstract

Social Network (SN) on Social Media Applications (SMAs) entails using the Internet to connect users with their friends, family, and acquaintances. These applications enable us to share photos, videos, and information, organize events, chat, and play games online. Communication between people, like in real life, is a network rather than a one-to-one connection. However, there are numerous privacy and security concerns to consider. Because of the importance of social networks in our current and future lives, this dissertation focuses on what social networks stand for and the possibility of creating a specific family social network.

Keywords: Social Network, Social media, Specific family social network, e-kinship.

ملخص

تتضمن الشبكات الاجتماعية (SN) على تطبيقات الوسائط الاجتماعية (SMAs) استخدام الإنترنت لتوصيل المستخدمين بأصدقائهم وعائلاتهم ومعارفهم. تسمح لنا هذه التطبيقات بمشاركة الصور ومقاطع الفيديو والمعلومات وتنظيم الأحداث والدردشة ولعب الألعاب عبر الإنترنت. كما هو الحال في الحياة الواقعية، فإن الاتصالات بين الناس ليست مجرد اتصال فردي، ولكنها شبكة اتصالات. ومع ذلك، هناك العديد من مشكلات الخصوصية والأمان التي تستحق وضعها في الاعتبار.

نظرًا لأهمية الشبكات الاجتماعية في حياتنا الحالية والمستقبلية، تأتي هذه المذكرة لتسليط الضوء على ما تمثله الشبكات الاجتماعية، وامكانية إنشاء شبكة اجتماعية عائلية محددة.

الكلمات المفتاحية: الشبكة الاجتماعية، وسائل التواصل الاجتماعي، شبكة اجتماعية عائلية محددة، القرابة الالكترونية.

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General Introduction

Background and Motivations

History has seen a series of communication revolutions. First, sign language was the means of communication between people, then spoken words were invented to facilitate communication, and the writing was invented, which also helped the communication process. Telephone inventions, radio, television, etc., continued until the twentieth century, which saw a real revolution in communication and information technology. The Internet was invented and developed, and social sites and platforms were created to play a major role in the rise of humanity. In this dissertation, we highlight social media with its flaws and features.

Problematic and Contributions

Social network has enabled users to exchange videos, images, files, and direct interaction between the audience of recipients. Social networking applications are the most prevalent on the Internet because of the characteristics and advantages they have, Our contribution is to clarify what social networks are, their importance and features, and to propose a new family application.

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Dissertation Organization

Our dissertation consists, in addition to the introduction and the conclusion, of three chapters. The first chapter is state-of-the-art chapter, while the other last chapters are the contributions to development of a social network application in the educational field, The dissertation is organized as follows:

Chapter 1: in this chapter we provide a conceptual, historical, and academic context for the articles in this collection. We begin by outlining what constitutes social networking applications and then provide a single perspective on the historical development of SNAs, highlighting the major works.

Chapter 2: the research methodology and data collection for the investigation will be presented in this study to allow us to start the development by having a clear and detailed idea of the static and dynamic aspect of the solution.

Chapter 3: the implementation and development of our system will be presented in this chapter.

Publications reached

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List of Abbreviations

Abbreviation	Signification
SN	Social Network
SMAs	Social Media Applications
BBS	Bulletin Board System
WWW	World Wide Web
IRC	Internet Relay Chat
API	Application Programming Interface
HTTP	Hypertext Transfer Protocol
OSN	Online Social Network
Amazon EC2	Amazon Elastic Compute Cloud
API	Application Programming Interface
GPS	Global Positioning System
CMS	Content Management System
UML	Unified Modeling Language
UC	Use Case
SD	Sequence Diagram
OOP	Object Oriented Programming
ID	Identification
JDK	Java Development Kit
SDK	Software Development Kit

List of Abbreviations (continued)

Abbreviation	Signification
Baas	Backend-as-a-Service
NoSQL	Not only SQL
JSON	JavaScript Object Notation
PC	Personal Computer
App	Application
IOS	iPhone Operating System
OS	Operating System
HTML	Hyper Text Markup Language
NDK	Native Development Kit
RIM	Research In Motion
SMS	Short Message Service
TV	Television

Chapter 1

Social Network Application Development

"Family and friends are hidden treasures, seek them out and enjoy their riches."

Wanda Hope Carter

1.1 Introduction

Nowadays, one can no longer imagine how to catch up with friends and contacts without social networking. Social networking helped us become closer to our friends, even when they are a thousand miles away. Through the World Wide Web, we are able to connect with people from around the world, making it easy to keep in touch with friends and family. Social networking now is a billion-dollar industry, but we can barely remember when it didn't exist. Today, social networking is an essential part of life for people from around the world. Social networking is a form of social media, used for either interactive, educational, informational or entertaining purposes. It comes in many forms, but all of them are related: blogs, forums, photo sharing, social bookmarking, just to name a few. This chapter will focus on all about social network applications and their development. We will start by defining what constitutes social network applications, and then highlight related works.

1.2   What is a Social Network

Social networks are websites that allow people with similar interests to meet and share information, photos, and videos.

People involved in social networks may do so as a personal or commercial endeavor. Those who share on social media sites interact as a personal endeavor using various forms of media to discuss their lives and interests.

Figure 1.1: Examples of Social Networks

The most popular social networks for this kind of familiar interaction include Facebook, Google+ and Twitter. Although these and other social networks can be used for commercial purposes (especially for marketing), social networks exist specifically for enterprise social networks. Popular social networking platforms for institutions include social representatives and yammer [5].

1.3   History of Social Networks

The Internet has given us the ability to connect with people from all over the world with a few clicks on a button, making it easier than ever to communicate with our friends and family. That's why social networks are the biggest industry of our time, but they haven't always been this way.

- The Early Years: the bulletin board system launched social networking in 1978. (or BBS). BBSs were hosted on personal computers, requiring users to communicate via the host computer's modem and exchange information with other users over phone lines. This was the first system that allowed users to log in and interact with one another; however, it was so slow that only one user could log in at a time.

- Later in the year: the first web browser versions were distributed via the Usenet bulletin board. Usenet was created by Jim Ellis and Tom Truscott, which allowed users to publish news articles or publications known as "news." The distinction between Usenet, BBS, and other forums was that they lacked an official or central dedicated server. Today, there are modern forums that use the same Usenet concept, such as Yahoo! Groups and Google. Theet Relay Chat, the first version of instant messaging, debuted in 1988. IRC was Unix-based, which limited most people's access. It has been used to share links and files, as well as to stay in touch with one another.

- The birth of social networks as we know them: geocitis was one of the first social networking sites, with its website going live in 1994. It was designed to allow users to create their own websites and organize them into "cities" based on their websites. The Globe.com was launched in 1995, allowing users to interact with others who share their interests and share their own content (see figure 1.2).

- Two years later: AOL Instant Messenger and SixDegrees.com were launched

in 1997. This was the year that instant messaging became popular, and it was the first time that internet users could create profiles and friend one another.

- In the following years: other social networking websites, such as Classmates.com, LinkedIn, and Tribe.net, began to appear, as did what would become the most popular social networking website in internet history.

- Facebook.com was founded in 2004 with the intention of connecting American college students, beginning with Harvard. More than half of the 19,500 students enrolled in the first month. After gaining popularity, Facebook allowed non-university students to join, and in 2008, Facebook surpassed MySpace as the leading social networking site. Since 1978, social networking has come a long way, and we'll all be watching it evolve for years to come, forever changing the way people communicate with one another [7].
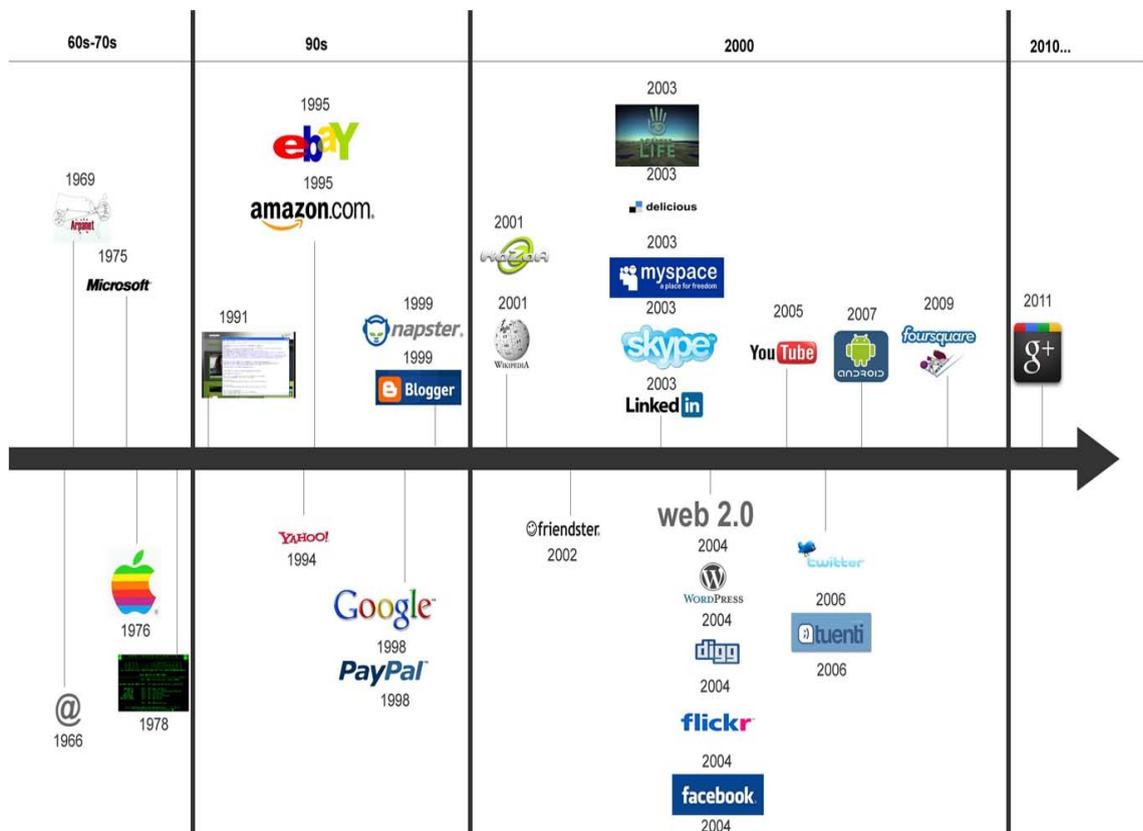
Figure 1.2: The History of Social Networks

1.4   Advantages of Social Networks

Since everything has its pros and cons, social media networks also have their advantages and disadvantages. These are some pros of social networks.

- It helps people to keep in touch with their relatives and friends from a distance in a very convenient manner.

- Social networks is a perfect way to promote products and services.

- It can be a perfect medium to for someone who expresses themselves over the internet.

- Social networks can be a good way to help charitable works or charities to deliver their needs to help other people.

- Social networks is a powerful search engines for those who wants to seek job locally and abroad.

- It can be a means to counteract organized crime or perhaps terrorism.

- Social networks can be a perfect way to look for partners, dates, or people can even utilize it in looking for lost pets and relatives.

- It can leverage political will for bodies that want to become more exposed publicly.

- People who are searching for thoughts and ideas about a certain topic can use social networks as well to solicit possible answers.

- It allows you to be yourself.

- Social networks can be an enormous fundraiser.

- It is useful as a marketing tool.

- Social networks can help people find new jobs [4].

1.5   Disadvantages of Social Networks

In the previous section we mentioned some of the advantages of social networks, and in this section we will introduce some of their negatives, which are as follows:

- Social networks can take a lot of your time and can prevent you from engaging in other important activities such as family bonding.

- It can also become a means of destabilizing the Government and a means of advancing some form of terrorism.

- It can be used to promote crime .

- It can create a significant barrier between people with Internet access and those without Internet access. Your privacy is at great risk because of social media and can affect your dignity and pride as a person.

- Social networks can significantly affect public policy and may cause many changes.

- It may lead to an increase in narcissism.

- Social networks invades our privacy.

- It takes a lot of time.

- Social networks is useful for criminals.

- It can increase feelings of inferiority.

- Social networks can lower productivity levels and academic performance.

- It creates an association with depression with frequent use.

- Social networks can endanger the lives of people.

- It creates content which cannot be entirely deleted [4].

1.6   Concept and Realization

To achieve intelligent reasoning and to understand user needs, the system also needs to make sense of context data. Such contexts could include information about people, objects, and the surrounding [2], and collecting such data can be done from a number of sources. For example:

- Infrastructure-based context data: network bandwidth, reliability, device configuration (display resolution).

- Application-based context data: service availability, access protocols, environmental constraints.

- Personalized context data: user, location, time, presence, device, agenda, contacts.

- Social context data: user interaction, ties between users and location, media capture, media share (audio, video, picture, text).

A variety of smart mobile applications can be built to take advantage of context from the various sources mentioned above. These intelligent mobile applications will eventually have an impact on mobile social networking applications by adapting to the user's current situation and simplifying communication. There are a number of different challenges associated with this, including usability, privacy and security, and data mining. One of the issues we discuss in this paper is how to use real-time contextual data to power these applications. This improves the effectiveness and applicability of social networking apps and allows them to respond more automatically. Some examples of such applications are provided below:

- Recommender Service: recommender services provide support to user and client requests. The accuracy of recommendations is fuzzy; it increases with the amount of available context information. Mobile applications are largely influenced. by context and users may want different types of services from the

recommender system, for example: locating hotels, route selection based on traffic, and service selection based on time.

- Podcasting service: as a networking application, podcasting is a relatively new feature of social services. Plurry.com provides access to a podcasting social networking site where users can podcast audio and video and track the number of visitors.

- Microblogging's service: micro-blogging is a popular service for social networking [2].

1.7   Importance of Social Networks

Social networks were intended to be a tool that people use to interact with their friends or family. It is becoming more and more interesting and is being used in companies that have a great desire to take advantage of these social media. Thus, you get the largest possible number of customers, grow their business, and achieve fame and profit. Social network sites provide the ability to communicate and share information with another person anywhere else or with many other sites anywhere in the world. Social media can be used to search for work that a person wants to do. And search for people interested in the field in which he is interested and exchange experiences with them. Networking sites are essential tools for businesses to find customers. Start interacting with them, increase sales, expand advertising campaigns, and promote new products. To get to know as many people as possible, promote companies or private companies and take care of providing good customer service. Social networking sites help reach people's interests in certain products through promotional advertisements. The category interested in the product is selected, showing the desired advertisement, and starting to interact with the company and communicate to get the product and many companies and institutions are working on it.

1.8 Types of Social Networks

There are three types of social networks: basic type, work related and additional Features [9].

- **basic type:** social networks were designed to be a tool for people to interact with one another. This type includes user profiles and general services such as personal correspondence, image sharing, audio and video files, links, text, and information based on specific classifications such as study, work, or geographical scope, as found on Facebook and MySpace sites.

- **work related:** it is one of the most important types of social networks, connecting professionally business friends, business owners, and companies, and includes user profiles that include their resume, what they have done during their study and work years, and who they have worked with.

- **Additional Features:** some social networks, such as Twitter and Blark, offer additional features such as microblogging and geo-networks, such as Bright Kite.

1.9 Architecture and Design of Social Network Applications

An online social network application is that:

- Serves as a meeting place for people to meet and form relationships with others (friends, colleagues, etc.). Each user articulates a list of other users with whom they have a connection.

- Includes a variety of tools to help people build a sense of community in an informal and voluntary manner. Online users communicate with one another,

contribute information to the common information space, and engage in various interactive activities (e.g. photo uploading, tagging, etc.).

- Contains specific components that enable people to: create an online profile, list their connections (e.g. friends, colleagues), receive notifications on the activities of those connections, participate in group or community activities, and manage permission, preference, and privacy settings.

A reference architecture of social networking application is depicted in Figure (1.4) the entire system is formed by the following layers:

- **Data Storage layer:** this layer is made up of two parts: the Storage Manager, which is in charge of efficiently storing social graph information and handling increased database loads, and the Data Store, which is in charge of handling increased database loads. This is typically accomplished through the use of distributed memory caching. The Data Store component, on the other hand, consists of storage elements that store information items from a social networking service. Multimedia databases, user profile databases, and so on are examples of data stores.

- **Content Management layer:** this layer is in charge of three major tasks. Firstly, it enables the incorporation of social information from remote online social networking applications via a Content Aggregator, which not only collects and organizes content from social media but also distributes it to other social network platforms. Second, it makes it easier to maintain and retrieve the social content graph via the Data Manager. Third, it manages user access by developing and maintaining an access control scheme.

- **Application layer:** each online social networking application provides a variety of services such as search, news feeds, mobile access, and so on. In order to analyze and manage the social content graph, the services communicate with the data manager and the access control manager. An application manager

distributes the applications to users. A set of APIs provided by the application manager facilitates user interaction. This component also includes a service framework for developing scalable cross-language services. A framework like this one enables users to deploy applications by abstracting the parts of each language that require the most customization into a common library that is implemented in each programming language.
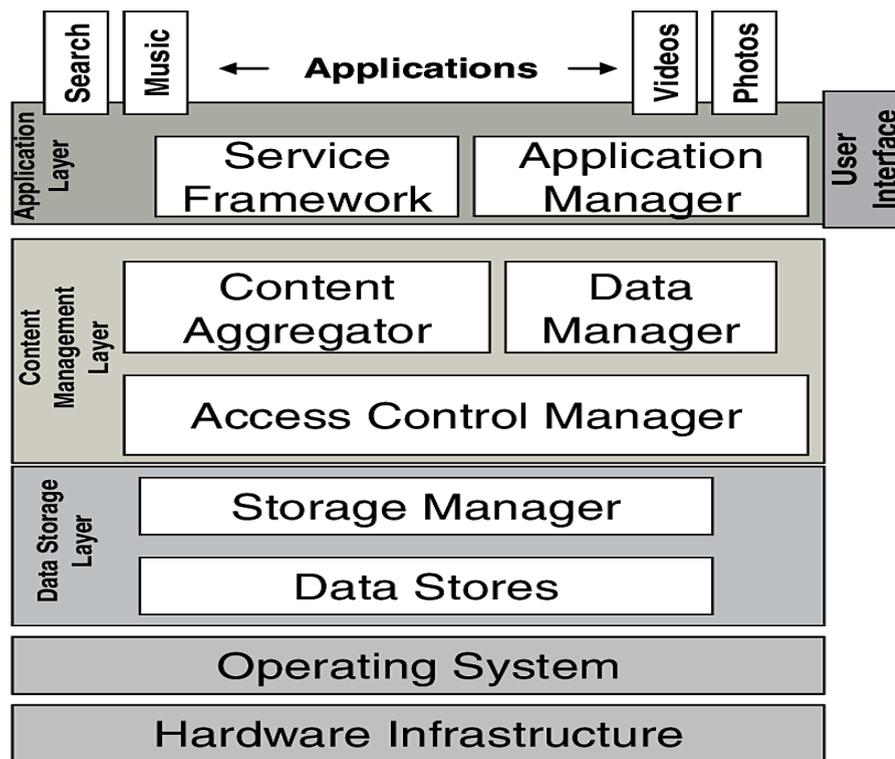
Figure 1.3: Architecture of Social Network

HTTP requests are used by users to interact with an online social networking platform. Each user has the option of registering as an authorized user or remaining anonymous. Registered users typically have more rights than anonymous users (for example, they can comment on published articles, upload figures, and so on).

The access control module is in charge of dealing with online social networking users' privacy and security settings. Specifically, the majority of research in the field of OSN security and privacy has focused on the development of privacy-preserving techniques, providing answers to issues such as personal information ownership and

privacy protection. Each OSN platform consists of multiple application servers, which provide a set of services and APIs.

A user forwards a request to the OSN platform, which then routes it to the appropriate application server. A load balancer is in charge of monitoring an OSN platform's application servers, balancing the load of requests, handling failover, and forwarding requests to the application servers.

Graph servers track and manage user connection relationships. Cache servers, in terms of content distribution, accelerate dynamic Web applications by reducing the load on application servers.

OSNa, in particular, have significantly different requirements than traditional Web applications. One of the major differences between OSNa platforms is the changing nature of user relationships and trust.

This behavior guides the design of OSNa's data placement, replication, and distribution algorithms. Another significant distinction is that OSNa involve a large number of small files that must be frequently accessed and updated by a large number of users, (CDNs) (e.g. Akamai, etc.) or Cloud Infrastructures. In a CDN environment, user requests are automatically routed to the nearest edge location, ensuring that content is delivered as quickly as possible.

The system in the Cloud is built on large clusters of processors. Facebook users, for example, can build their applications on Amazon Web Services (Amazon Elastic Compute Cloud (Amazon EC2) and Amazon CloudFront), which improves reliability, flexibility, and cost-effectiveness.

Finally, OSN platform Data Stores can be centralized or distributed across multiple administrative domains. Concerns have been raised about the privacy and scalability of centralized OSNa. Data can be stored in a peer-to-peer infrastructure with an overlay management layer to overcome these limitations. The overlay network layer would include mechanisms for managing node identities, building and maintaining topologies, message routing, node search services, and interacting with local resources and the underlying fabric [11].

1.10 Features in Social Media Applications

There are currently various types of social media applications, including WhatsApp, Instagram, Snapchat, YouTube and more. Each of these applications has its own unique features. Before deciding on the features, you should first determine what kind of social media application is appropriate for your work. Below, we reveal key but powerful features that can be integrated into all kinds of social media applications and pave your way to success.

- **User Profile:** having a user profile that is able to retrieve the user data via REST API calls from LinkedIn, Google+, Twitter and Facebook.

- **Personalization:** there must be a way to personalize to provide. A social media app should provide: Photo effects, background colors, customizable bios, links, shareability, discoverability of the content.

- **Feed:** social media feed helps users to share the posts, user-generated stories, user-uploaded audio, video, presentation, and photos.

- **GPS Settings:** let users share their location with their family and friends. This is implementable via location API that retrieves a device's location from GPS and mobile network providers. This location data can even help businesses in monetization.

- **Status updates:** users may post pictures, text messages, videos on someone's timelines to express their desires and intentions.

- **Provide Rich Text Editors:** it enables users to make their content creative, beautiful and unique. Simple and Interactive Interface: to enable easy sharing of content.

- **Managing the Self Esteem:** people like maintaining a sound image and get instant rewards in the form of likes, comments, share, and subscriptions for their activities on the social media platform.

- **Social media platforms are often linked with one another :** users are able to share their WhatsApp stories on Facebook that remains active for 24 hours. Users' who post the status update are able to view the names of the people who watch their story. Often times if the story is visible to public.

- **Connections :** content-based connections, Talker, Admirer, Groups, and Events.

- **Social authorization.**

- **Feed :** news and entertainment.

- **Post Creation :** text/audio/video content.

- **Post likes:** love/care/sad/wow expressions.

- **Social notifications + push notifications**.

- **Analytics** (hidden for users).

- **Content Management System (CMS)** [12].

1.11   Mobile applications

A mobile application, also known as an app, is a type of software designed to run on a mobile device such as a smartphone or tablet computer. Mobile applications are frequently used to provide users with services that are similar to those available on PCs. Apps are typically small, standalone software units with limited functionality. A mobile application is also referred to as an app, a web app, an online app, an iPhone app, or a smartphone app [14].

The user must download the application in order for it to be executable from the phone's operating system, just like regular software that is installed on a regular computer. Because of the computer language used, mobile applications cannot be

transferred from one operating system to another: if you download an Android application, you can only use it on an Android mobile phone.

A large majority of mobile applications were originally created for Apple's mobile phone, reflecting the iPhone's commercial and technical success. However, since 2010/2011, the number of installed Android applications has surpassed that of iPhone applications[13].

Figure 1.4: Applications Mobile

The download of the mobile application is done according to two options:

On phone through internet connection.

On PC by connecting it with the mobile phone. mobile applications are grouped into several series according to basic criteria:

- **Applications working without internet:** called independent applications, these are applications that work without the need for an internet or telephone connection, including a contact list, calculator and others.

- **Applications requiring connection:** unlike independent applications, these applications must have access to the Internet to function.

- **Connected applications:** this is an application that requires an internet connection for proper operation.

- **Applications interacting with other smartphone equipment:** every smartphone has a suite of advanced equipment more than ordinary mobile phones and this equipment is in constant interaction with certain applications. We quote the bar-code or code scan to know the price and characteristics of a product sold in hypermarkets.

- **Application interacting with other mobile users:** generation Y is familiar with connecting to the internet and the mobile phone, which justifies the importance of applications that strengthen the links between mobile users instead of connecting passively to social networks [15].

1.11.1   Type of Mobile Applications

Any user may come across three types of mobile applications, which are native mobile applications, mobile hybrid applications and web applications.

- **Native mobile applications:** Native mobile apps are designed to be "native" to a single platform, such as Apple's iOS, Google's Android, or Microsoft's Windows Phone.
  The native platform has the advantage of optimizing the user experience. It can operate more quickly and intuitively because it was designed specifically for the platform (see figure 1.5).

Figure 1.5: Native Applications examples

- **Mobile hybrid applications:**

  These apps, like native apps, can be installed on devices and run through web browsers. HTML5 is the programming language used to create all hybrid apps. Although hybrid apps are not as fast or as reliable as native apps, they are more capable of streamlining the development process.

  Your company can save time and resources by not having to build and maintain apps for multiple platforms. It's ideal for apps that are primarily about delivering content.

  Evernote is the best example of how hybrid application performance is no longer an issue.

  Despite its attractive design, Evernote is extremely effective at increasing productivity. Evernote's intuitive and flawless functionality is built with (mention the framework)[17].

Figure 1.6: Evernote

- **Web applications:** When accessed from a mobile device, responsive websites switch to a different design. Adaptive web applications, on the other hand, scale to fit different mobile device screen sizes. The design of these apps does not change. Web apps are created with the most popular programming languages, but they cannot use mobile device hardware or be sold in any app store[16]. the following figure (see figure 1.7) shows a desktop web browser combines all web applications in one place.
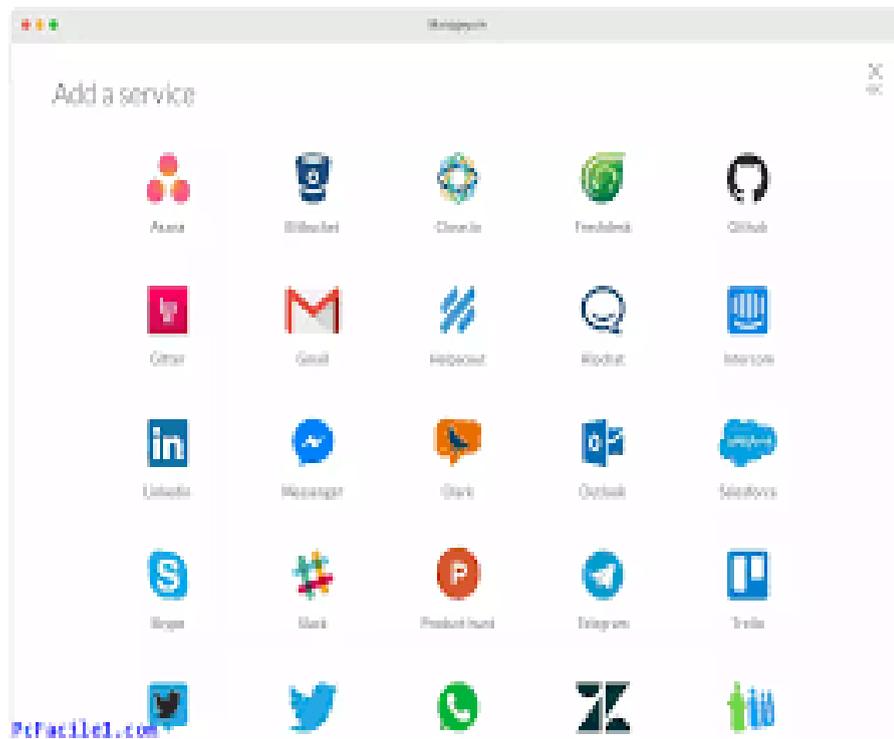

Figure 1.7: Web Applications examples

1.11.2   Mobile operating systems

Today, four major smartphone technology companies dominate the global mobile phone market: Google, Apple, RIM, and Microsoft, which develop the Android, iOS, BlackBerry OS, and Windows Phone 7 operating systems, respectively.
To learn about the market leader in the Smartphone market and the system that best meets the needs of our application, we will briefly present each of these systems and describe their benefits and drawbacks:

- **Android:**

  Android is a free and open operating system (OS) for tablets, smartphones, and smart TVs. It was created in 2007 by the Android company, a Google-acquired start-up. It is a computer operating system based on the Linux kernel. An Apache license makes this possible.

  Android includes all of the utilities that a manufacturer needs to implement it in a mobile phone. To facilitate adoption, it is made available to all mobile phone manufacturers.

  It was created with the intention of integrating Google applications such as Gmail, Google Maps, Google Calendar, Google Talk, and even YouTube.

  Android is a system that is nearly identical to IOS in terms of features and applications. Whereas Apple strives for consistency and security, Android provides more options and customization.

Figure 1.8: Official logo of Android System

Java will be the programming language used to create a mobile application for this medium. The Android SDK will be the "development kit" or SDK (Software Development Kit) in other words the development tools used. The NDK also supports the C++ programming language (Native Development Kit) [13].

- **IOS:**

Apple's iPhone operating system, formerly known as iPhone OS, is a mobile operating system developed by Apple.

It is the most successful operating system to date, having been recognized for its fluidity, ergonomics, and intuitiveness. It has the App Store portal, which has established itself as a benchmark among mobile application kiosks with a catalog of over 200,000 applications.

iOS is the second most popular operating system after Android. It only works with "iPhones," or Apple-branded smartphones. Apple's mobile operating system has long been held up as a model for its ease of use. It primarily consists of multiple home screens that house the applications.

Figure 1.9: Official logo of IO System

It is possible to create app folders, but widgets or other means of displaying information directly on the home screens are not supported. After resisting, Apple eventually offered a well-done notification center – well after Android –

as well as a shortcut bar for quick access to connectivity, flashlight, APN, and so on. We especially like the universal search function.

It will browse everywhere in the operating system, as the name implies, and will quickly become indispensable for the most demanding users.

Finally, the multitasking system is excellent, though some users may prefer other systems that display the most recently used apps in the same window [13].

- **Windows Phone 7:**

  The latest operating system, Windows Phone 7, distinguishes itself from competitors through its hub system, which brings together all elements of the same category (contacts, photos, games, etc.). For example, if you visit the contacts blog, you will be able to see the most recent calls, messages, and Facebook photos....

  Windows Phone 7 places high demands on smartphone specifications, requiring memory and processor to meet minimum performance levels.

  Features that make browsing easier and more enjoyable. The interface also includes a powerful gaming platform with access to Xbox Live, Microsoft's online gaming service. Another significant contribution is that Windows Phone 7 includes the Office Pack (Word, Excel, Powerpoint, and so on): ideal for productivity.

Figure 1.10: Official logo of Windows Phone 7 System

The only shortcoming of Windows Phone 7 is the scarcity of applications. Because it is younger than its competitors, it does not have as large a catalog as the Android Market or the AppStore, but many developers are assisting in catching up [13].

- **BlackBerry OS :**

Research In Motion created the BlackBerry wireless communication platform (RIM). RIM's solutions integrate hardware, software, and services to provide simple and transparent access to critical information such as electronic messages, telephone messages, SMS, and Internet and Intranet applications.

RIM's products, services, and technologies have won numerous awards and are used by thousands of companies worldwide. Long reserved for professionals, BlackBerry needed to adapt to its new, younger clientele and fell prey to the allure of QWERTY keyboards, which are ideal for sending written messages.

Figure 1.11: Official logo of BlackBerry OS

BlackBerry OS has evolved from an austere interface dedicated to email (which can be sent and received instantly) to a more pleasant and comprehensive interface over time.

The system is full of good ideas, beginning with the ability to separate your work and personal lives on a single phone. The home application store, App World, continues to grow, but the OS's strength is its compatibility with Android programs, which only require minor tweaking from developers [13].

1.12   Related Works

Connecting with each other comes to us more easily now that we can just tap away on a keyboard and chat with a person who lives over 3000 miles away. Finding information knows no boundaries with Google on every computer in the world. The following list consists of the best family social network application.

1. **FamilyApp:**[1] (see figure 1.12) is a free messaging app that was created to bring the family together, Everyone, whether a parent, grandparent, or child, can use a smartphone or tablet device to access this safe app.

Figure 1.12: Official logo of FamilyApp application

It's one of the most recent family apps to appear on the market. FamilyApp is one of the best apps available for sharing interesting information about the family! End-to-end encryption ensures data security and privacy on this private communications platform. So can communicate with family and friends in a secure manner.

Can create one or more families with those close, or can create a group for scheduling carpools, sports activities, or coordinating with a babysitter. With

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[1] https://familyapp.com/

the app's dependent user feature, even family members who do not have a mobile phone or phone number can use it on a tablet.

This innovative app, complete with advanced security features, makes having a dedicated space for your family life simple and enjoyable!

2. **A Tree of Me:**[2](see figure 1.13)a private family social media network.

   It is intended to capture fleeting moments and share memories with family and friends, as well as witness special moments from the past in real time as they occur, for years to come. It guarantees that personal information will never be sold to third parties.

   Only the participant can determine who can see their common elements as they communicate with friends and family members. He'll figure out how to map your family's interactive tree easily and safely.

Figure 1.13: Official logo of A Tree of Me application

3. **Steller:**[3](see figure 1.14) it can be a fun pastime for parents and kids to get together and make a picture book of a special event. And the Steller family app can do the legwork for you! To create your own family story, all you have to do is add the words and the photos. Steller will provide a variety of striking layouts so that you can share a vacation, birthday party, or graduation. While

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[2]http://www.atreeofme.com/
[3]https://steller.co/

you can put this story on social media, privacy settings will ensure it's only shared with those you choose. It's integrated with third parties, too, so you can get fun offers from travel destinations to keep exploring the world with your family.

Figure 1.14: Official logo of Steller application

4. **Nestled Time:**[4](see figure 1.15) is a private family diary and social network for capturing the time you share with your little ones by locking all their photos, videos and stories in one place. Family and friends can be invited to be a part of the worlds we create and to contribute to their special memories. We will make a magical gift of complete childhood within our reach from beginning and favorite to most adventures and important milestones.

Figure 1.15: Official logo of Nestled application

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[4]https://www.nestledtime.com/

Nestled Time allows us to create the world's smallest social network that revolves around our children. Childhood moves fast.

5. **Kin:**[5](see figure1.16) is a private social media space for families.

    Kin gives your family a secure private social media space where you can connect with each other today, share memories from yesterday and even leave messages for tomorrow. All free of advertising and without your data ever being up for sale.

    Stay connected and up-to-date on the stuff that really matters. From your niece's milestones to your grandparents' 50Th anniversary, we provide a safe, private digital space for families to share life's best moments through photos, videos and messages; as well as building a digital legacy of cherished memories and stories to share with future generations.

Figure 1.16: Official logo of Kin application

Take a step away from traditional social media and strengthen family bonds. Traditional social media can be draining.

You want to see what your friends and family are up to, but your timeline is filled with a load of angry political posts, multi-level marketing schemes and photo-shopped images that don't reflect your everyday life.

Kin makes it easy to take a break from traditional social media while still

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[5]`https://www.kin.family/`

staying connected to the people who matter most to you, no matter how far away they are.

In this section we discussed some of the social network applications and their roles, for our project we are developing a social media application which has the same characteristics as the previous but will be more fluent and easy to use.

1.13   Conclusion

Our lives have been drastically altered as a result of social networks. Our lives have become more convenient because social networks is a very useful tool for us in the twenty-first century, it can help us improve our lives. However, we must be mindful of how we employ them. If we can use social networks wisely, having them will be a positive change for us.

in the following chapter, the research methodology and data collection for the investigation will be presented in this study to allow us to start the development by having a clear and detailed idea of the static and dynamic aspect of the solution.

Chapter 2

Proposed Family Network Application

"If art interprets our dreams, the computer executes them in the guise of programs!"

Alan J. Perlis.

"Say what you will about fame and the intrusion of dangers, for all the glories of the world and all its extraordinary events do not equal one hour of family happiness."

Beckinsfield.

2.1   Introduction

In the previous chapter, we talked about the nature and importance of social networks, an overview of their history, some of their advantages and some disadvantages.

In our project life cycle, design is an essential and critical stage for producing a high-quality application. This chapter aims to analyze and model our project using the Unified Modeling Language (UML), we will present the system architecture with descriptions of the required tools and basic sequence diagrams.

2.2   General Conception

Our proposed social network application pertains to families in order to link more and more kinship relations and the feeling of living together without a distance or excuse, so we find that the users of this application is any member of any family who can belong to our digital world by first belonging to his hypothetical family created once from the party of any individual (be it a brother, father, aunt, or...).

Our client can share different memories with his family, or he can participate in parties, events, invitations, etc. He can also communicate with family members at any time he wants.
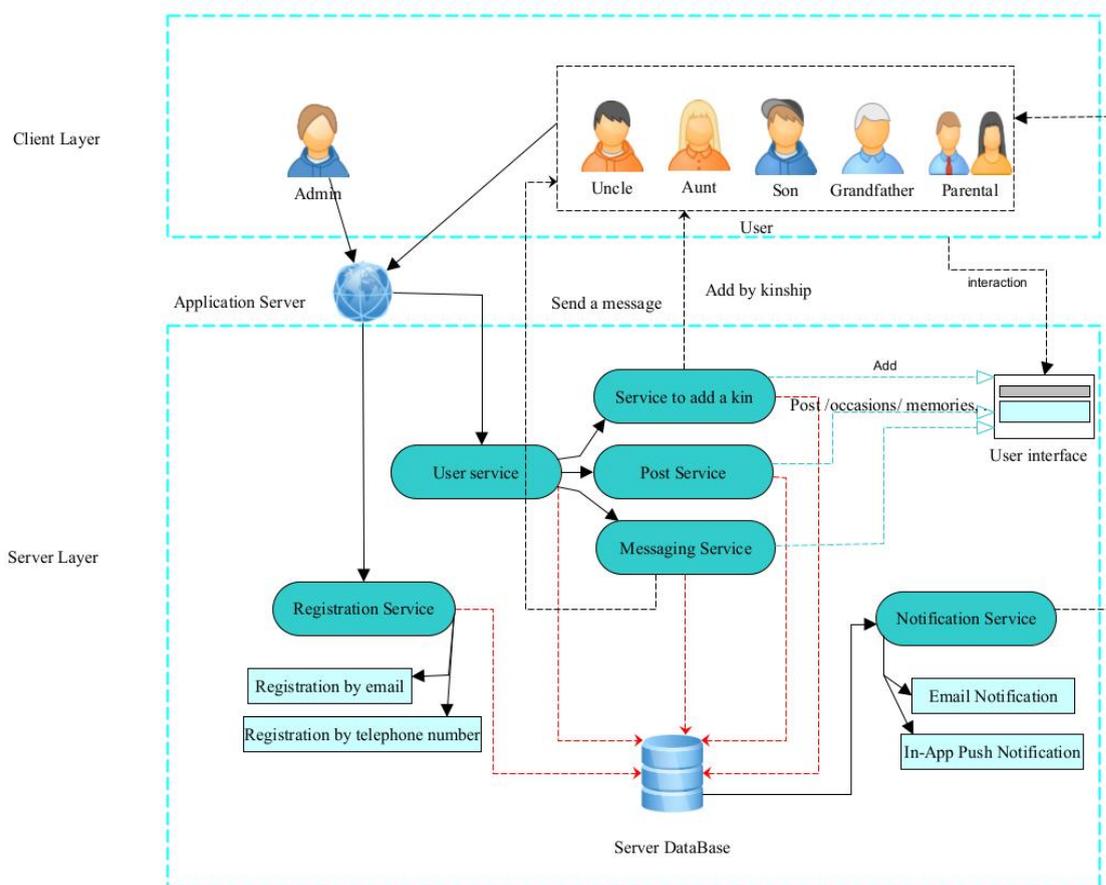

Figure 2.1: System Architecture of our Proposed System.

2.2.1 The Functional Needs in The System

The functional needs in our system of the user are:

1. Registration: the user must register before logging in to the application, by entering their email and password which are mandatory to be able to log in, as well as this personal information.

2. Messaging: the user can send text messages, voice calls, or video messages to family members.

3. Add a kin: the user can add a family member (depending on kinship).

4. Post management: the user can manage these own posts, add new posts, modify them, delete them and see posts of other users he has followed.

5. Profile Management: he can manage his own profile by changing his personal information, his password, his photo...

6. Like, comment (posts): he can like posts or comment on them.

7. Determining the relationship between a new user and another user by using logical relations.

2.2.2 Non-functional Needs in The system

Our system must meet the following quality criteria:

- **Security:** user accounts must be protected, so connection with login and password is essential. The visibility of private content must also be managed.

- **Integrity:** the integrity and consistency of the data must be ensured at each update and insertion into the database.

- **Speed:** speed of execution of processing (optimized code).

- **Ergonomics:** interfaces must be user-friendly and ergonomic. They must be simple, legible, comfortable to the eye and easy to use.

2.3 Use Case Diagram

in this section, We will show the general and main outline that will help us in and depict our application.

2.3.1 Definition

A use case diagram is a UML diagram used to give an overview of the functional behavior of a software system. A use case represents a separate unit of interaction between the actor (human or machine) and the system. It is an important entity to work in the use case diagram, there are actors that interact with the use cases (UC) [6].

2.3.2 Actors

In our proposed system, we find two types of actors (users), the first of which is the administrator, and the second is the user.

- **Administrator:** he is the first family member to register and create the virtual family (the person who manages the family group from its inception until controlling its members).

- **User:** any family member who has an account on our social network.

2.3.3 Global Use Case of Actor

In the beginning, the user is able to access each of registration, log in or reset password. When the user is already have an account, he can:

- Create a post (Memories, Wedding Invitations, Birthday Reminder)...

- Send an invitation to any family member.

- Send a message to any family member.

- Receiving notices.

- Change one of the settings in the profile.

- Like and commentary on other people's publications.

  and other tasks that we will clarify in the use case diagram below (see figure

  2.2).

In our application, there is only one person to create the family (he is the administrator), the virtual family cannot be created more than once.
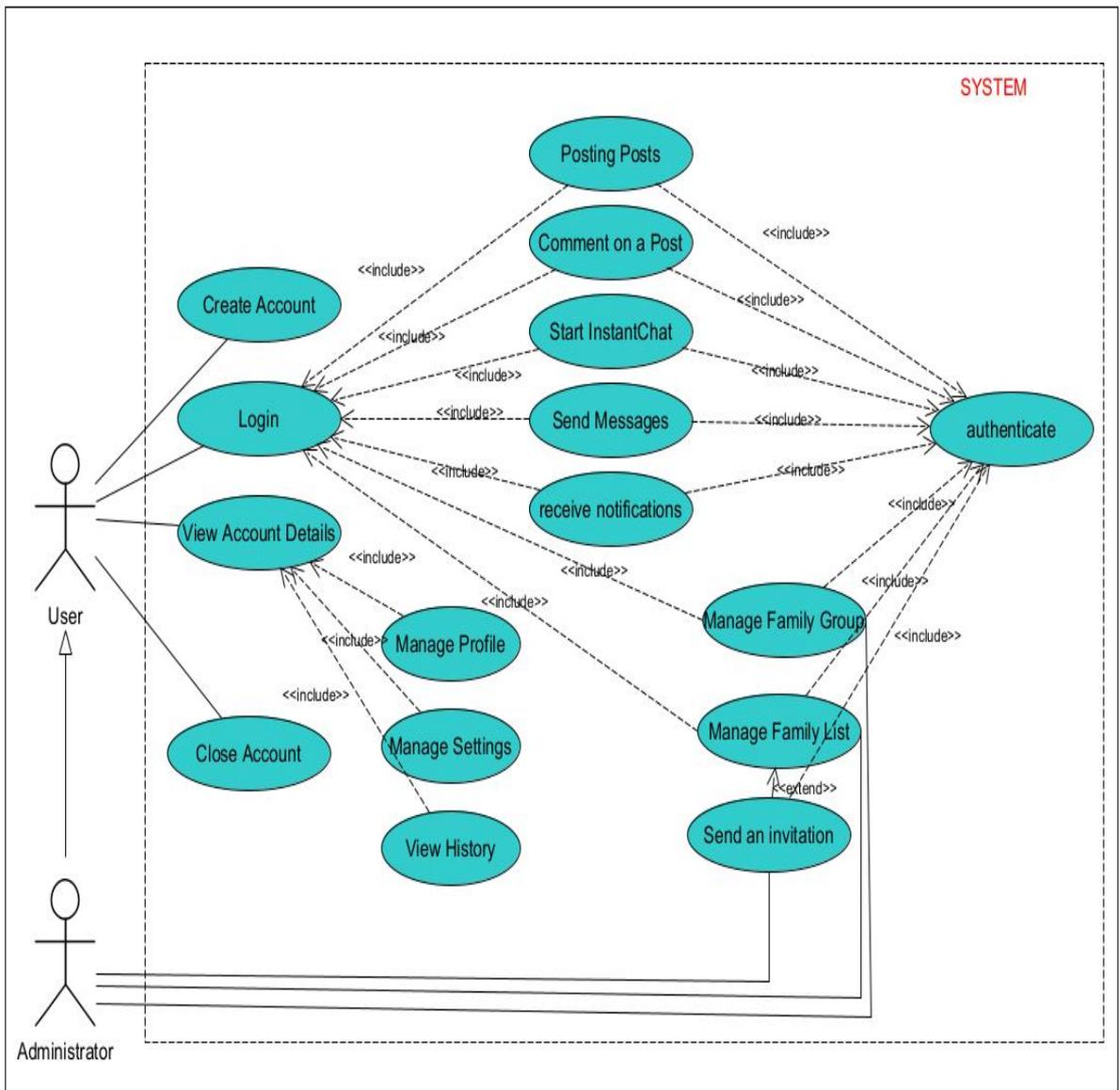

Figure 2.2: Global Use Case Diagram

2.4 UML Diagram

In this section we will describe the steps and cases of user interaction with the mobile application.

2.4.1 Use Case of Manage Posts

The following diagram (see figure 2.3) is an illustration of the use case of Manage Posts, it shows that the user can add a post that may be an image, video or even text, and he can edit or delete this post completely, for more clarity.
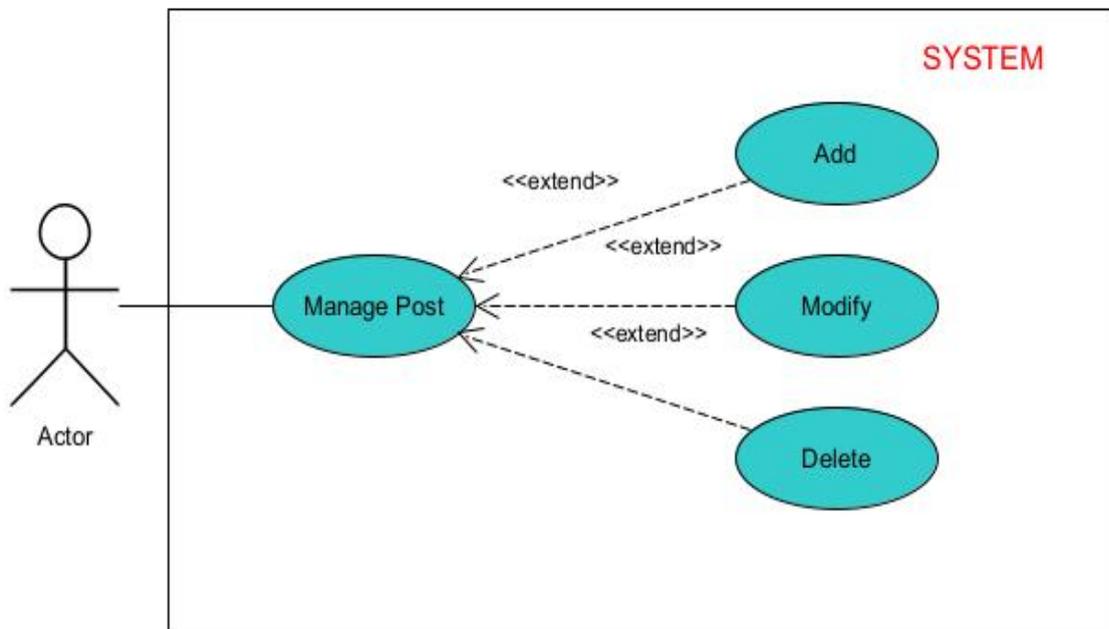

Figure 2.3: Use Case Diagram of Manage Posts

- **Scenario Description of Add a post**

    If the user wants to add a post, it is by completing the title and text form and then validating it, the user must authenticate before adding posts, the user completes the form and then validates it. Here the post is added to the database. If the extension fails. An error message should appear to the user (see figure 2.4).

Table 2.1 Table Description "Add a post"

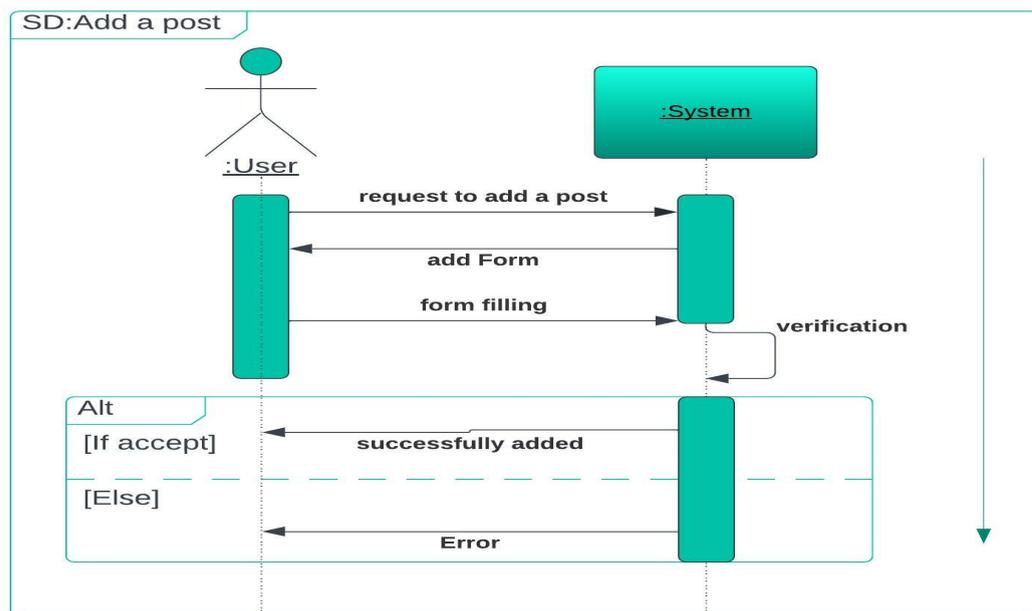| Use Case	Add a post
Actor	User
Description	Adding a post by completing the title and body form then validation.
Precondition	The user must authenticate before adding posts.
Nominal scenario	The user completes the form then validates.
Post-condition	The post is added to the database.
Exception scenario	Add failed. An error message should be displayed to the user.

Figure 2.4: Sequence Diagram of Add a Post

2.4.2   Use Case of Registration

- **Scenario description of Registration**

  The user is registered by filling out a form with the necessary information. The user must click on the registration link or button to open the registration

form. The user fills out the form and then validates it. A message appears to the user stating that the user has been successfully added to the database, and if there is a malfunction. An error message should appear to the user (see figure 2.5 and table 2.1).

Table 2.2 Table description "Registration"

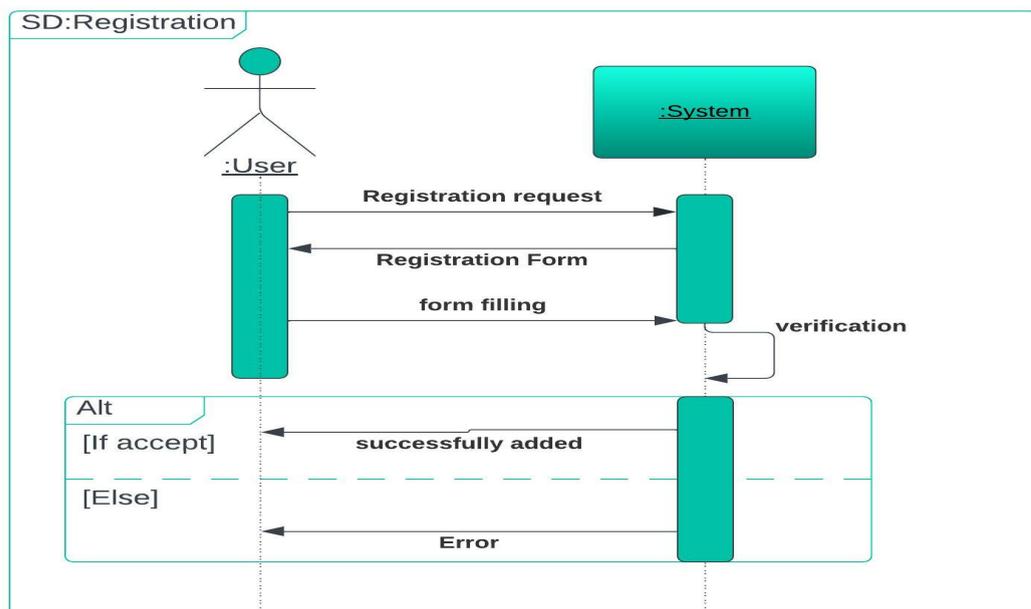| Use Case	Registry
Actor	User
Description	The registration of a user is done by filling out a form with the necessary information.
Pre-condition	The user must click on the register link or button to open the registration form.
Nominal scenario	The user completes the form then validates.
Post-condition	The user is added to the database successfully.
Exception scenario	Add failed. An error message should be displayed to the user.

Figure 2.5: Sequence Diagram of Registration

2.4.3 Use Case of Authenticate

To authenticate the user's account, the user must use an email attached with a password that no one knows (see figure 2.6 and table 2.3).
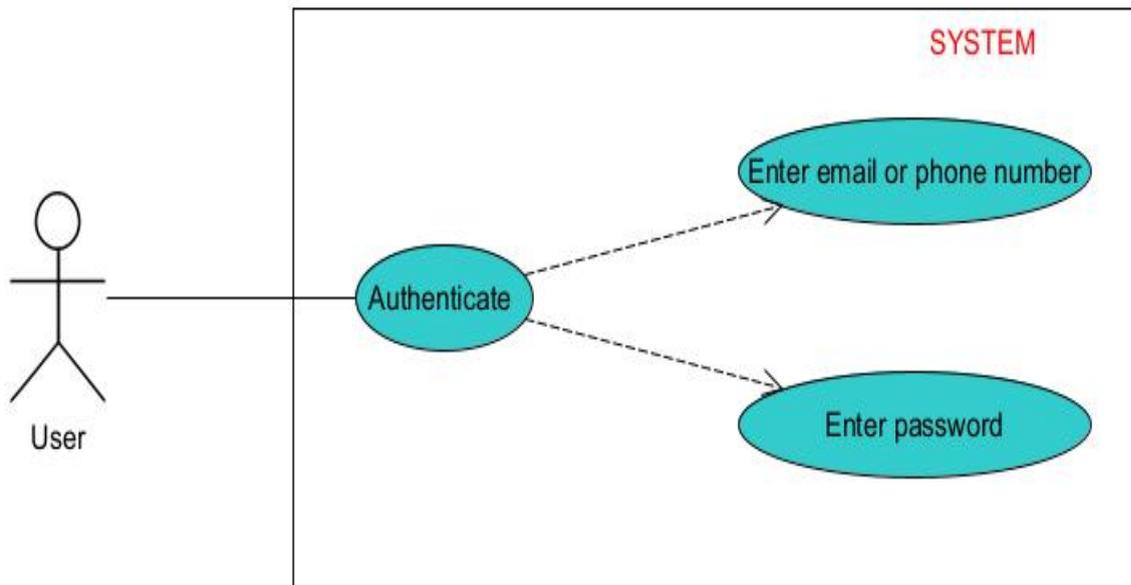

Figure 2.6: Use Case Diagram of Authenticate

Table 2.3 Table description "Authenticate"

Use Case	authenticate
Actor	User/administrator
Description	The authentication of a User made by filling out a form with his email and password.
Precondition	The user must open the application then wait for the display of the login form.
Nominal scenario	The user completes the form then validates.
Post-condition	The user will be directed to the "home" page of the application.
Exception scenario	Login failed. An error message must be displayed to the user, when the email or password is incorrect.

- **Scenario Description of Authenticate**

  The user enters his email and password. The system verifies the e-mail and password. If they are correct, the system displays the appropriate space for each user.

  If the e-mail and password are incorrect, the system returns the user to the authentication page with an error message (see figure 2.7).
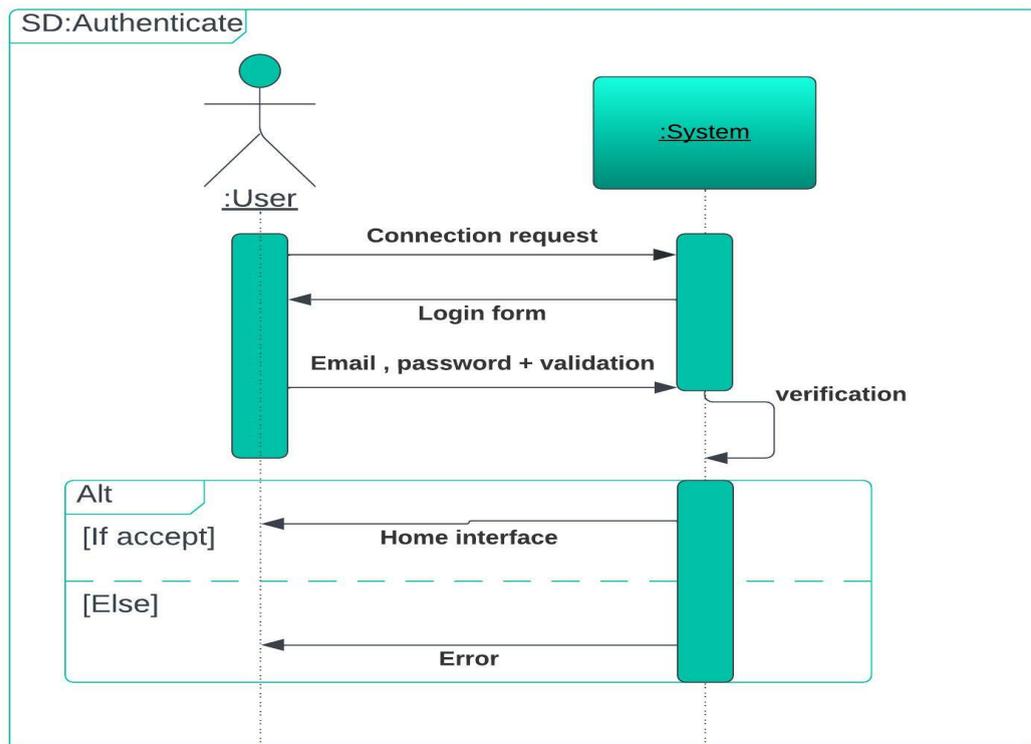

Figure 2.7: Sequence Diagram of Authenticate

2.4.4 Use Case of Send Message

Communication is essential in a person's life, and he cannot live without it.

So in our system the user can write and communicate with any member of his family by sending a text message or an expression. he can also contact him with a voice call or a video call (see figure 2.8).
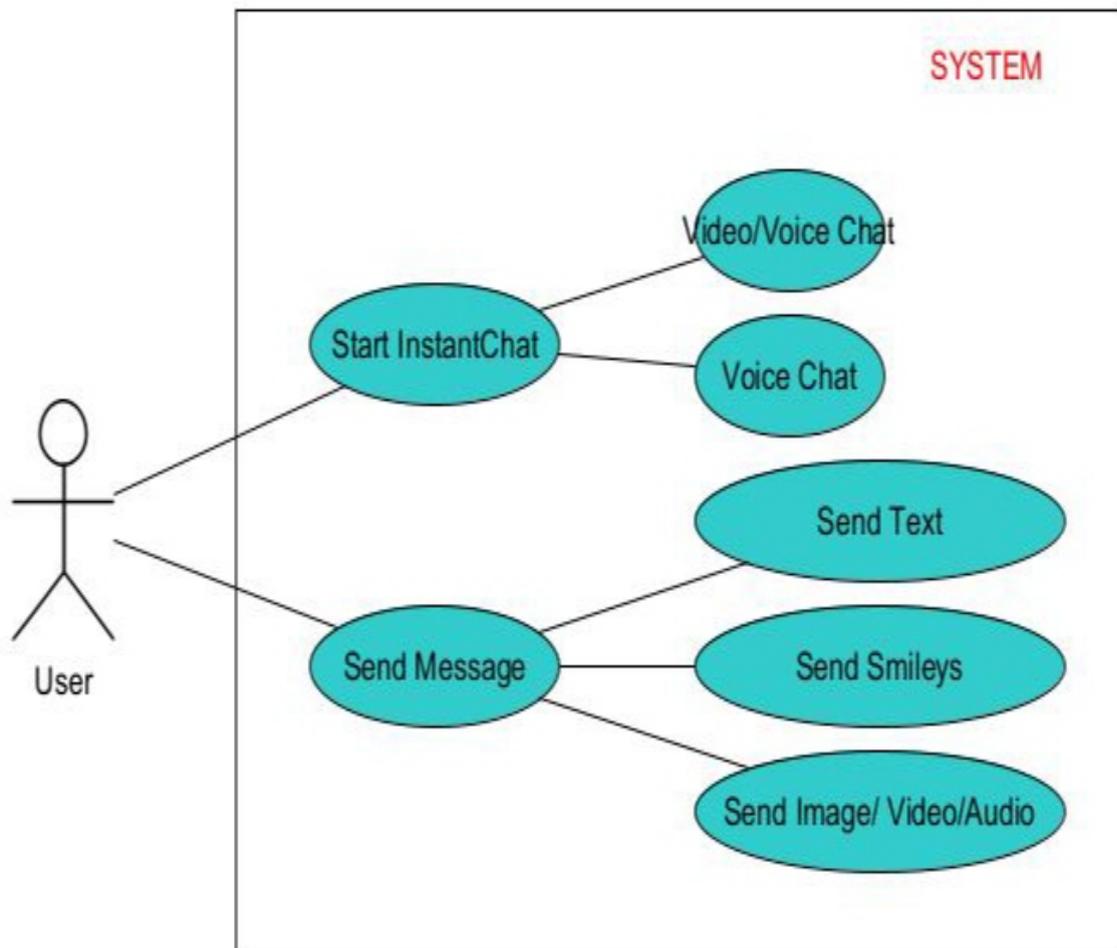
Figure 2.8: Use Case Diagram of Send Message

- **Scenario Description of Send Message**

  The first user (the sender) creates a message and sends it to the second user (clicking the send button), here the system saves the message in the database. This message can be a text message, an emoji, an audio or video call.

  The second user (the receiver) receives the message addressed to him and can reply to it.

  After saving, it is clear to the sender that the message has been sent and received by the receiver (see figure 2.9).
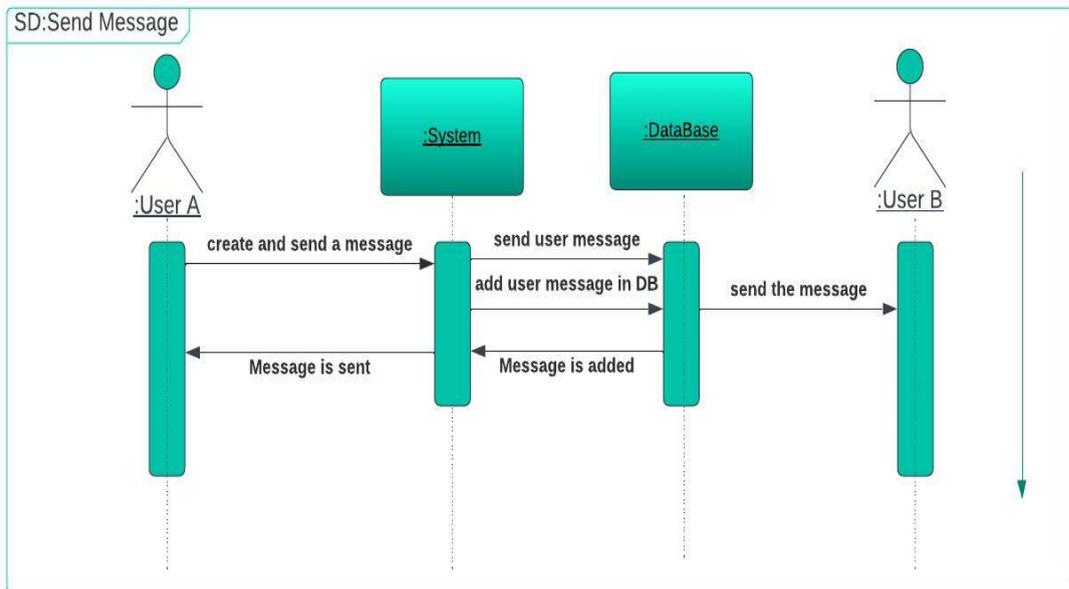
Figure 2.9: Sequence diagram of Send Message

2.4.5 Use Case of Send Invitation

The user can expand the scope of his family by sending invitations to all members of his family to join his virtual family, he can send this invitation by phone number or by e-mail (see figure 2.10).
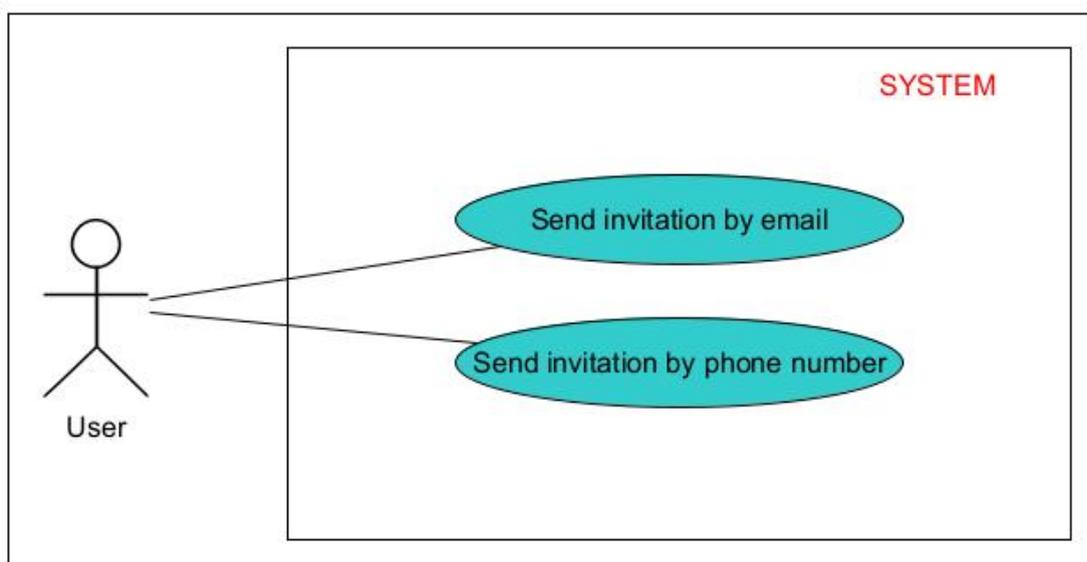

Figure 2.10: Use Case Diagram of Invitation

- **Scenario Description of Send Invitation**

  The first user (the sender) forms the phone number of the person who wants to join his family in the field designated for that, then the sender sends an invitation request. The system notifies the second user. Here the invitation request is saved in the database. The second user has the right to accept the invitation or ignore it (see figure 2.11).
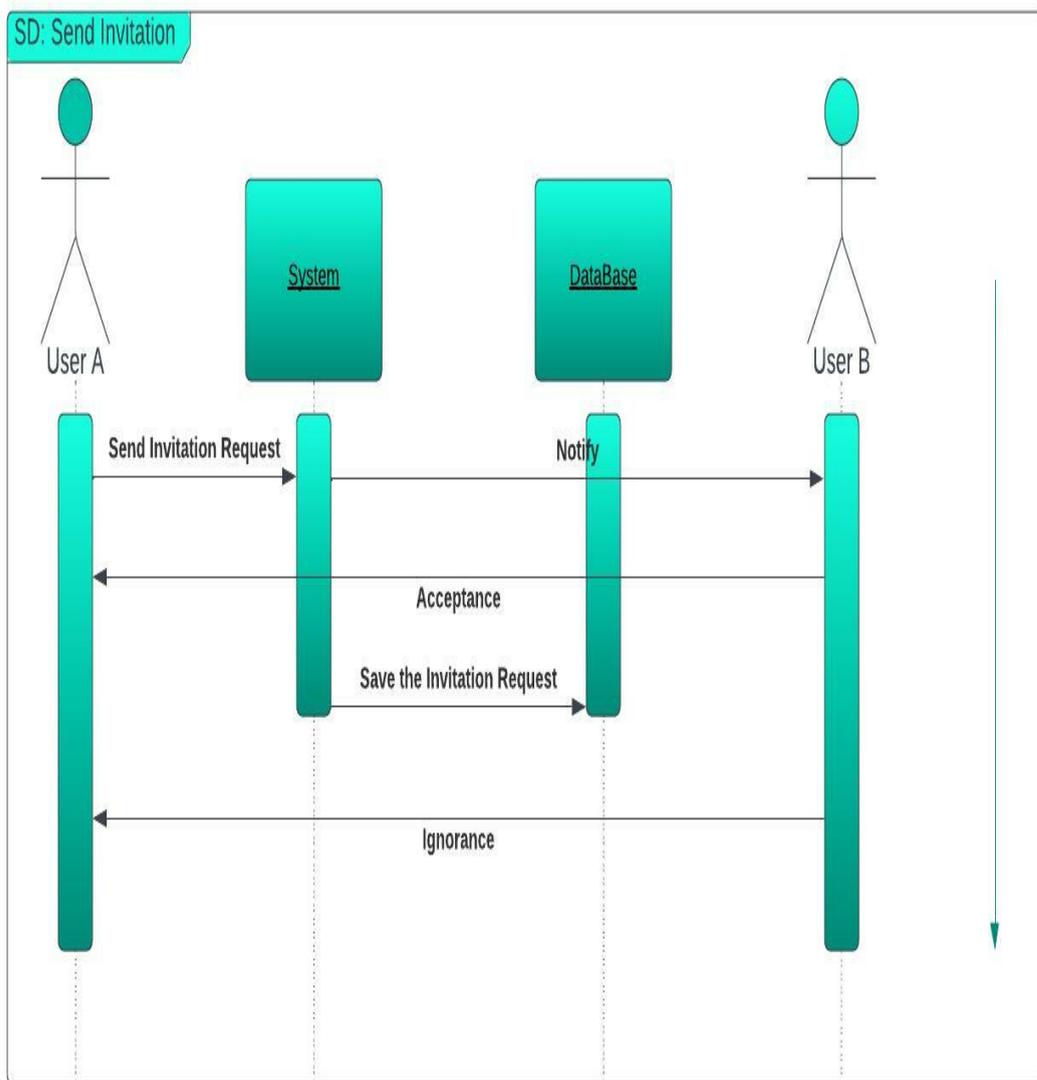

Figure 2.11: Sequence Diagram of Send Invitation

2.4.6   Use Case of Notifications

User A sends a meeting invitation (for example) to user B. User B receives a notification, informing him of this invitation. User B accepts the meeting proposal, the user A holder of the proposal receives for his part a notification of the acceptance of the meeting of the user B.

The notification is sent correctly in both directions.

If send notification failed. The user does not receive a meeting proposal notification sent to them. Hence the possibility of not being able to accept this proposal within the deadline.
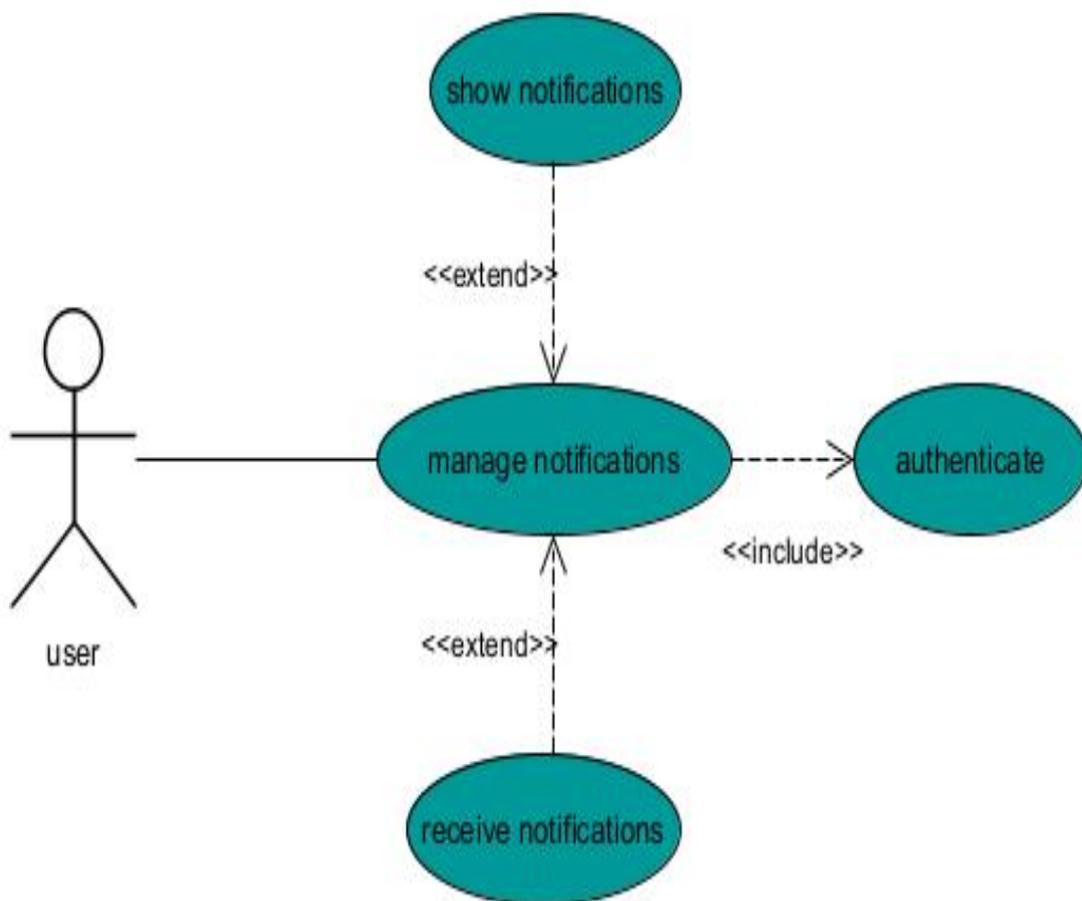

Figure 2.12: Use Case Diagram of Notification

2.4.7   Class Diagram Definition

A class diagram is an illustration of the source code relationships and dependencies between classes in the Unified Modeling Language (UML). In this context, a class defines the methods and variables of an object, which is a specific entity in a program or code unit representing that entity. Class diagrams are useful in all forms of object-oriented programming (OOP).

In a class diagram, classes are organized into groups that share common characteristics. A class diagram looks like a flow chart in which classes are represented as boxes, each box having three rectangles inside. The upper rectangle contains the name of the class; the middle rectangle contains the attributes of the class; the lower rectangle contains the methods, also called operations, of the class. The lines, which may have arrows at one or two ends, connect the boxes. These lines define the relationships, also called associations, between classes [3].

2.4.8   The Management Rules

- The user can be an administrator or a user.

- A user can only belong to one family.

- Family is created only once.

- User can add, like or comment on multiple posts.

- A user can have many kinship relationships with other users.

- The post can be liked by many users.

- A post can contain multiple comments.

- Commenting is related to one post, and is added by one user.

- The user can be in a blocked or active state.

- A like pertains to one user for one post.

2.4.9 Class Diagram

We will represent our application with a diagram that shows us the content of this application by placing some classes and relationships between these classes (see figure 2.13).
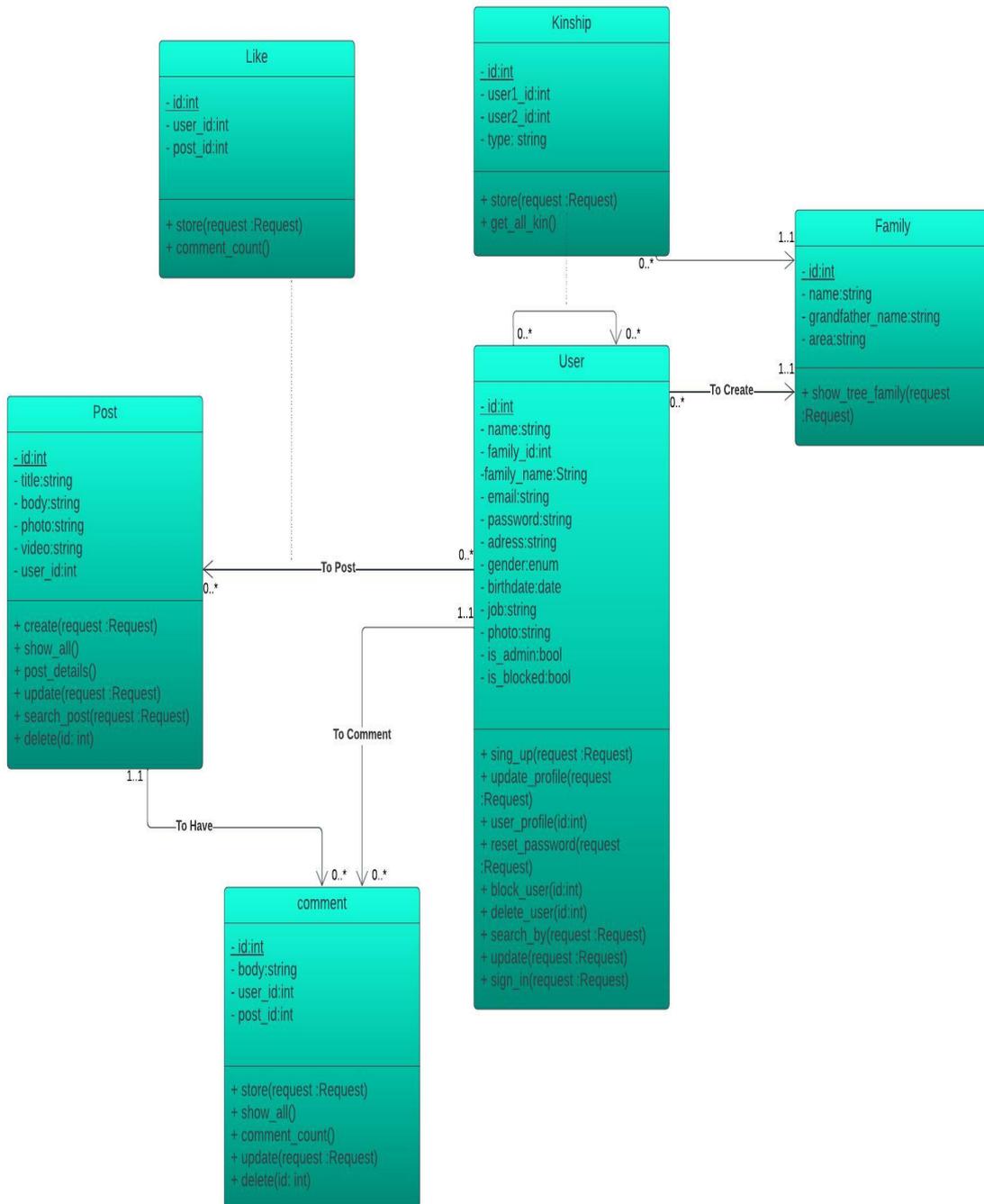

Figure 2.13: Class Diagram

In this graph, we find the different classes and relationships that represent the structure of the database:

- **User:** the class that represents the user, it contains all of this personal information, as well as their state (is_blocked) and role (is_admin).

- **Post:** post represents any user post, and can have comments and likes. Holds information describing a post and a foreign key (user_id) of the user class to identify the user who posted it.

- **Comment:** it is the class that represents comments related to a post created by a user, thus it holds the two foreign keys of the associated classes post and user (post_id and User_id) and the comment body (body).

- **Kinship:** it is a link category to represent a one-to-many relationship between one user and another, so it holds two foreign keys, one representing the first user ID ($user1_id$) and the other representing the second user ID (user2_id).

- **Like:** an association class (n to n relationship) between post and the user, containing the two foreign keys of these two classes. It represents the users' liking for the published posts.

2.5   Conclusion

In this chapter we presented the UML diagrams necessary to the realization of our solution, which allows us to start the development by having a clear and detailed idea on the static and dynamic aspect of the solution. It remains to code what we have designed.

The following chapter will present the working environment, namely the tools and methods used during development.

Chapter 3

Implementation and Development

"You have to learn the rules of the game first, and then you have to learn

how to play better than the others."

Albert Einstein

"The orphan is not the one whose father died. The orphan is an orphan

of knowledge and literature."

For Imam Ali bin Abi Talib

3.1   Introduction

Implementation and development are two important steps to start the development of mobile applications and make the idea a realistic reality, according to specificities, limitations, risks and so on.

In this chapter, after we have explained the concept and architecture of our application, we will talk about the remaining part of our dissertation which is a description of the hardware and software needs. Additionally and at the end, we will show different interfaces for the application we worked on.

3.2   Implementation

In the following, the various hardware and software tools used for the realization of our project.

3.2.1   Hardwares Description

For the development of our solution, we used an DELL brand laptop with the following characteristics:

- **Processor :**Intel(R) Core(TM) i5 CPU M 520 @2.40GHz .

- **RAM :** 8,00 GO.

- **System type :** Operating system 64 bits (Windows 7).

and The Xiaomi Note 8 Pro phone with the following characteristics:

- **Processor :** Helio G90T Professional Gaming Processor.

- **Storage and RAM :** 8GB + 128GB.

- **System :** Android 9.0, with MIUI10 user interface.

3.2.2   Softwares Description

The different software and technologies used for the development of our project are: android studio, jdk, sdk, firebase.

3.2.2.1   Android Studio

Android Studio is an integrated development environment, created by Google for Android systems. It facilitates development by offering different tools and features. To work with and install it, it is necessary that we use and install the Android SDK and JDK development kit [10].

Figure 3.1: Android Studio Logo

3.2.2.2 Android SDK

This environment provides all the tools necessary for the development of Android applications. These main features are:

- **An explorer:** allows me to explore the folders of projects that we have created on this program, in the form of a tree structure displayed on the main interface.

- **An editor:** it makes it easier for me to edit and manipulate the code with advanced features, such as coloring the sentences related to the programming languages used to detect errors more easily, and auto-complete.

- **An emulator:** allows me to test the entered code on a virtual terminal to visualize the encrypted application [10].

Figure 3.2: Android SDK Logo

3.2.2.3 JDK (Java Development Kit)

The Java Development Kit (JDK) is a software development environment used for developing Java applications and applets [8].

Figure 3.3: JDK Logo

3.2.2.4 Firebase

Firebase is a Backend-as-a-Service (Baas). It provides us as developers with a variety of tools and services to help us develop high quality applications, and grow our user base. It is built on the Google infrastructure.

Firebase is categorized as a NoSQL database program, which stores data in JSON-like documents [1].

Figure 3.4: Firebase Logo

3.2.3 Mobile Application Interfaces

My Kinship 1.0 is a private family social media network is designed to capture fleeting moments and share memories with family, friends and witness special moments from the past, in real time, as they happen, for years to come.

This section explains the complete conceptually of the proposed system. It also presents the detail explanation of each and every service of system.

The following figure (figure 3.5) shows the logo of our application.where the letters M and K stand for my name (Maroua KAHOUL) and My Kinship stands for the name of our application.

Figure 3.5: My Kinship Logo

3.2.3.1 Login Interface

To use the My kinship application, the user must enter the email and password (in the appropriate field) for his personal account.

If he forgets the password, he can click on "Forgot Password", which allows him to reset a new password.

If he does not have an account, he must create an account by clicking on the word "sign Up" (see figure 3.6).
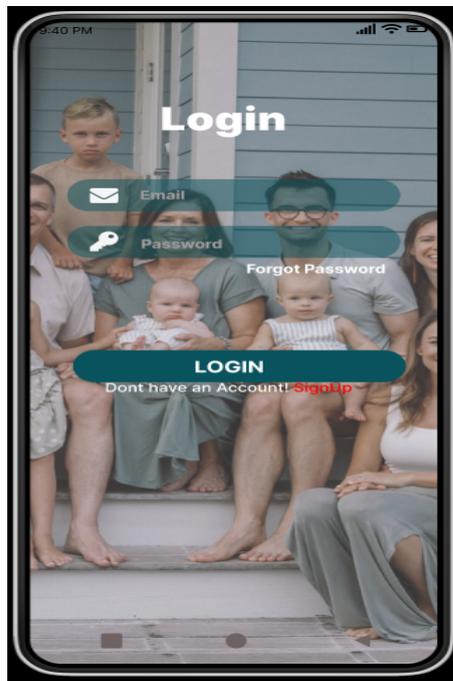
Figure 3.6: Login Interface

3.2.3.2 Registration Interface

To create an account in our special application, the user must enter the ID of the family sent to him by the inviter (see figure 3.7), and then enter his information (see figure 3.8).

Figure 3.7: Registration Interface

Figure 3.8: Family Creation Interface

If he is the first person from the family who wants to join us, he must create a virtual family and enter the necessary information for that (see figure 3.9).
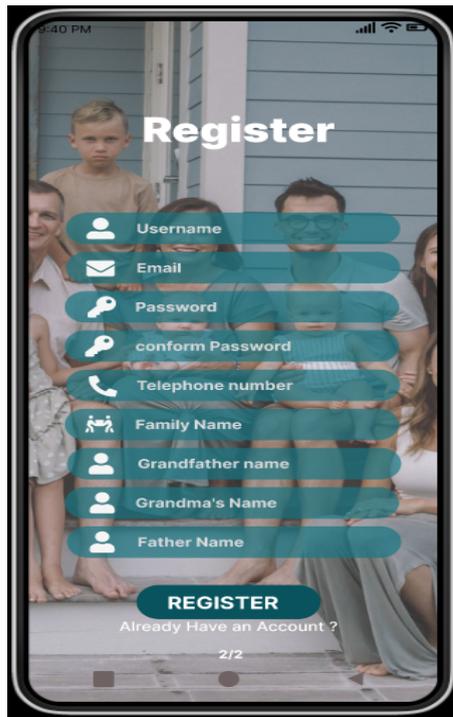

Figure 3.9: Account Creation Interface

3.2.3.3   Home Interface

In the Home interface, the user can see the publications of his family members (birth parties, graduation parties, memories..), like them, comment on them, and save them, or share with the family any publications (see figure 3.10).
He can also see the people who shared the story of their day or add the story of his day.
It can also move from this interface to other interfaces such as the family Profile interface, the family members interface, the chat interface, and others that I will talk about later.

Figure 3.10: Home Interface

3.2.3.4 Profile Interface

The user can see information about any member of the family, such as place of residence, workplace, phone number..., and this is according to the information that the other person wants to share. The user can also contact this person by message, voice call or video call (see figure 3.11). Or any information posted by the user by going to the front of his profile (see figure 3.12).
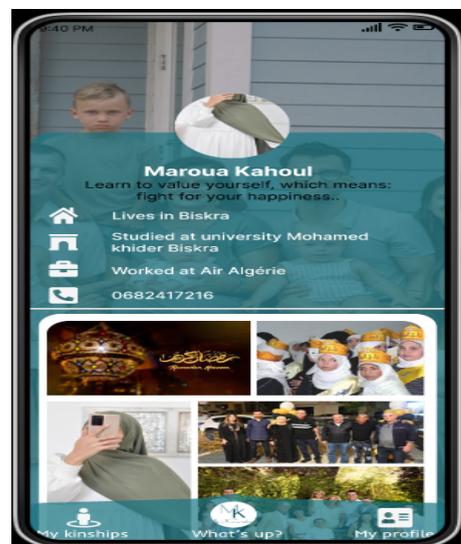

Figure 3.11: Family Member Profile Interface

Figure 3.12: User Profile Interface

3.2.3.5 Family Profile Interface

In the family profile interface, we find that the user can see the number of family members belonging to his virtual family.

He can also see everything that has been shared by all individuals, according to the classification, if he so desires (see figure 3.13).

Figure 3.13: Family Profile Interface

3.2.3.6 Chat Interface

If the user wants to communicate with any of his relatives, he can do so provided that he belongs to the virtual family.

He can send a text or voice message or send pictures, and he can also contact him with a voice call or a video call (see figure 3.14).

Figure 3.14: Chat Interface

3.2.3.7 Members Interface

This interface shows the members belonging to the user's family, in addition to the kinship relationship between each member and the user (see figure 3.15) and the user can define these relationships manually as our system can define them by logical linking.
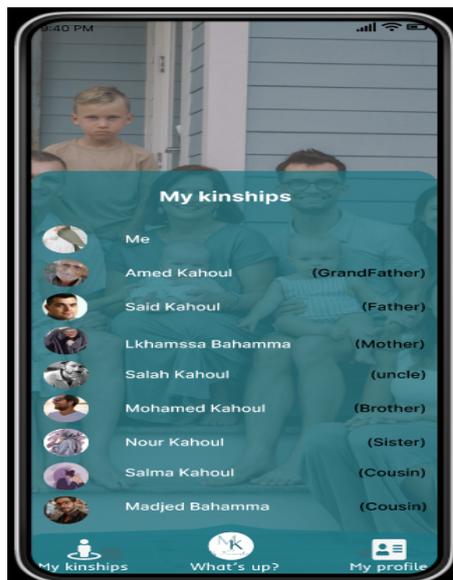

Figure 3.15: Members Interface

3.2.3.8   Invitation Interface

In order to expand the family, the user must send invitations to join his family (if he wants to, of course), he can send these via the phone number or e-mail of the person, the user must write the phone number or e-mail correctly in the field designated for that, choosing relationship with this person (see figure 3.16).

Figure(3.17) shows the invitation sent in the form of a short text message (invitation by phone number), this message contains the name of the application and the ID that the other person uses to create an account, if the invitation is accepted.

Figure 3.16: Invitation Interface

Figure 3.17: SMS Invitation

3.3   Development

The new property and feature that we put in our application is the smart identification of family relationships, that is, the first person to create a virtual family will invite his family members to join him in our network, by defining his relationship with the person he wants to invite, from here the journey of smart identification begins. When the invitee accepts the invitation, it is recorded in our database. Where our system begins to determine the type of relationship between this individual and the rest of the family members engaged in our private network.

for example:

1) $\{$x, y, a, b$\} \; \epsilon \; person, \;\; A : a = Father(x,y), \;\; B : b = Mather(x,y)$

   $A \wedge B \rightarrow C \quad \backslash C : y = Brother(x)$

2) $\{$x, y, a$\} \; \epsilon \; person, \;\; A : a = Father(y), \;\; B : y = Father(x)$

   $A \wedge B \rightarrow C \quad \backslash C : y = Grandfather(x)$

3.4   Conclusion

In this chapter, we presented our project's goal of creating a family social communication app under Android, as well as various tools and techniques necessary to achieve our system as well as screenshots of activities in order to describe the app that has been implemented in more detail.

General Conclusion

"Failure is success if we learn from it."

Malcolm Forbes

"Success is simple. Do what's right, the right way, at the right time."

Arnold H. Glasow

T his project allowed us to design and develop a mobile app under Android in the field that occupied the power of the world. This work was organized in three phases, and we started with a preliminary study of our project during which we generally dealt with the explanation of social networks and the explanation of mobile applications with different operating systems. Phase II relates to the design of our app, and we have used UML modeling language for the modeling part and Android Studio development environment to achieve this. Finally, we have been able to create a simple and effective tool that helps the user communicate and care for their family. The tool produced is very satisfactory. However, many views remain possible.

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