

Letter of Client

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Dear Dr. Pairat,

It is our great honor to have an opportunity to cooperate with you on the File sharing project and we are pleased to submit this project requirement documentation by our team APP plus.

Regarding the file sharing project brief, it is hoped by us that this project requirement documentation shall explain factors related to this project well. Our idea is to ensure that we have accomplished project background research which also ensures the best returned project results.

Our team is firmly committed to our goal and we are hoping this documentation explains well.

Lastly, we would like to wish you a wonderful experience with us.

Thank you,
APP+ TEAM

Z.Mao

Project Requirement Documentation

by

App+ Solutions

Presented By Team Members 2021/09/17

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Executive Summary

With the continuous progress and development of science and technology, the information age is changing the way of life of mankind. In the Internet age, a lot of people's work began to rely on the assistance of the network, which not only saves time, enhances communication, but also improves work efficiency. Mobile phone software has become very common in people's lives because of its advantages such as convenience, speed, and flexibility. It has also been loved by everyone.

File sharing function has been gradually transformed from the need to send emails, select recipients, attach files and send more than ten years ago. We are developing this type of application that allows users to safely share files, photos or messages on the cloud. The user can achieve this effect in the application.

This report describes in detail the development and deployment of the software, including target market analysis, design methodology, development environment, deployment environment, tools, requirements analysis and other components. Introduced in detail the design process and development process of our file sharing software.

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Introduction

The main goal of the project is to develop a mobile phone application (FastForwards), add some further features to the software, it can help users to safely share files, photos or messages on the cloud, and comes with a simple social chat function. The project is composed of 6 members of our team. We need to develop more in software interface, interaction, design, programming, database, etc. In order to achieve this goal, we conducted a simple survey of the market, and the current system conducted a reasonable analysis to gain a deeper understanding of its missing content, enumerated the functions we need to achieve, and determined the primary and secondary The purpose of the user community is to understand the technical details of the problems in the field. At the same time, it explained and explained the environment and design scheme of the system being planned and developed.

Target market

The product we are developing is an Android mobile application. The specific functions are chatting, making friends and transferring files, so our target market is Android mobile phone users aged 15 to 64.

Demographically:

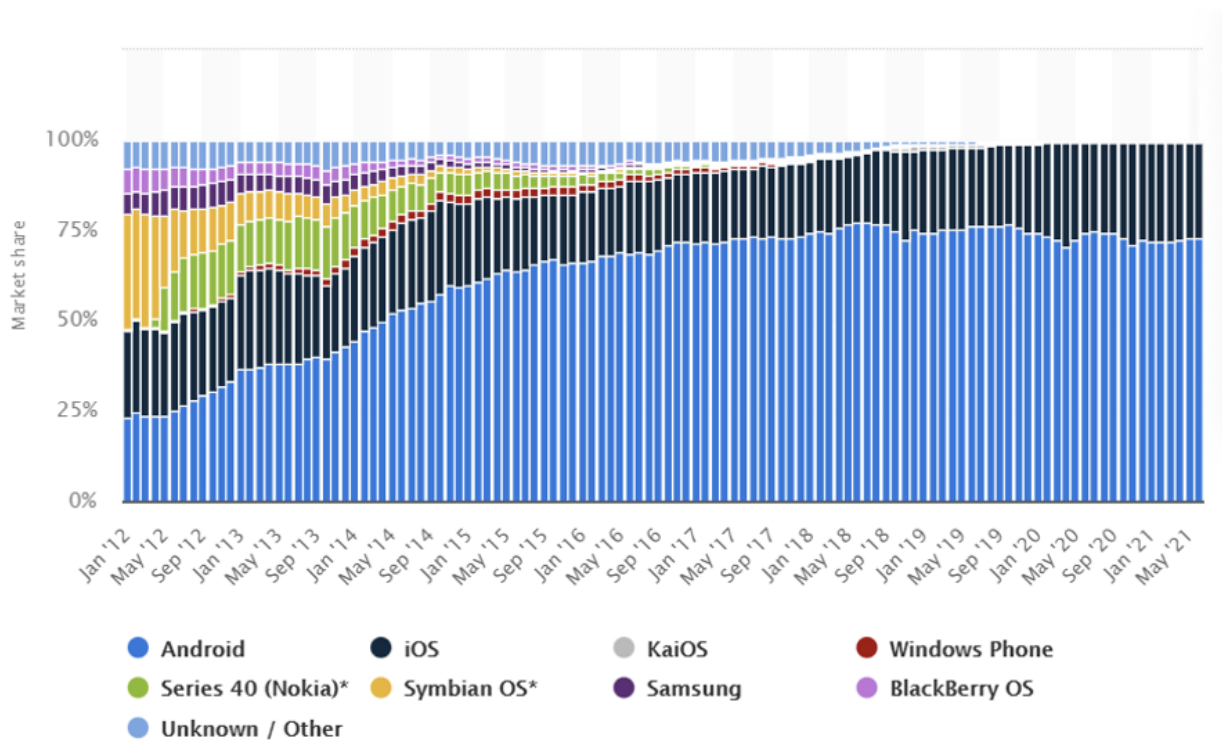
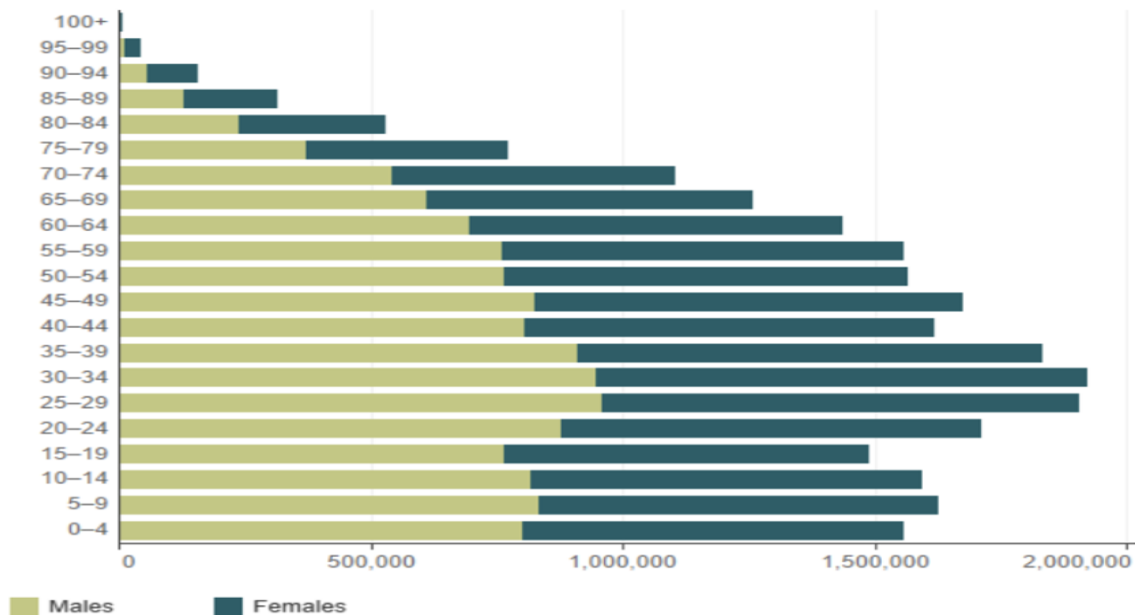


Fig1.1 Mobile phone platform market share ratio chart

According to the data up to June 2021, the Android platform occupies 72.48% of the current mobile phone platform market. This is why we are developing Android mobile applications for the devil. This will allow us to capture a large number of users.

*Fig1.2 Australia population data map*

This is the data for 2019. The age group of 15 to 64 accounts for 64.8% of Australia's total population. Most people in this age group have their own mobile phone and are willing to socialize with others on the Internet. We need to attract them to become our users with quick and convenient functions.

Competitor:

Discord:

Discord is currently on the market and the most popular of our similar applications, followed by some key statistics:

Discord generated \$130 million revenue in 2020, according to WSJ, an 188 percent increase year-on-year

Almost all of Discord's revenue comes from its Nitro, its premium enhancement bundle

Discord has over 140 million active monthly users and 300 million registered accounts

In 2021, it was valued at \$7 billion, doubling its value in under a year.

Year	Monthly active users
2017	10 million
2018	45 million
2019	56 million
2020	100 million
2021	140 million

Fig1.1 Discord monthly active users

Sources: Business Insider, Techspot

WeChat:

WeChat is a social application from China with the function of transferring files. It occupies a large market share in China and has a large number of users, followed by some key statistics:

Tencent's social network revenue was 108.2 billion RMB in 2020, which accounts for 22% of the company's total revenue

In Q1 2021, WeChat had 1.24 billion active users

WeChat has 3.2 million mini programs on its platform, which transacted 1.6 trillion RMB in 2020

45 billion messages were sent daily in January 2019 on WeChat

Year	Users
2012	50 million
2013	195 million
2014	396 million
2015	549 million
2016	762 million
2017	938 million
2018	1.04 billion
2019	1.17 billion
2020	1.2 billion
2021	1.24 billion

Fig1.2 WeChat users

Design methodology

In this project, an encryption file sharing phone application is required to be designed. Shared files can not be downloaded without sender permissions. Despite this, the server will function as a transfer station, it will not know exactly what information is encrypted or decoded. This indicates that a point to point encryption method needs to be considered.

In the beginning, some user interfaces will be designed based on marker research and principles of human centered design. Then one most suitable interface will be selected. The group contains two main missions: coding and essay. These two parts need to ensure the development progress is the same as scheduled as well as have sufficient communication. Dev-Ops will increase collaboration with each team member and have shared responsibilities. Despite this, developers and operations can easily implement continuous integration and continuous development. As all the members are in one unified team, this will improve application development.

For software development, modular structure should be concerned. This indicates that one real life question will be solved through one or more parts of code; one complex question will separate into small questions. Meanwhile, ACM code of ethics for software development will

also be used in this project, as an encryption application, the application development, management as well as maintenance needs ethics approach. Most importantly, one application must consider integration for future further function improvement requirements; automated test code needs to be added to the development. Interface faults will be detected in integration testing with an effective unit testing. Write Box testing applied to increase logic flow. Many Github have examples of CI/CD, this will reduce development difficulties.

Development environment & Tools

With the development of modern technologies, the development environment of software engineers becomes more and more diverse. It can be represented in these following areas:

1. Hardware Environment
2. Software Environment
3. Support Tools

Hardware Environment

As a professional software developer, it is necessary to have an outstanding hardware environment during the development processes. It is believed that an outstanding hardware environment allows software engineers to achieve higher efficiency, ability to develop cutting-edge technologies and updated design. The reason why software developers are required to be equipped with high-performance workstations or laptops is that normally a software project occupies a large amount of computing sources and there is a possibility that a workstation which is not capable for this mission will likely be down when developing. There are several benefits if we equipped excellent hardwares:

1. Avoid late deployment
2. Better work efficiency
3. Prevent unaffordable lost When hardwares down e.g: Data failure, Server failure

According to the reasons given above, the recommends of hardware items include but not limited:

Workstations

Workstation for developers might be different depending on situations. For android developers, a Dell Inspiron business workstation with 10th Gen Intel® Core™ i7 processor is an ideal choice for business purposes. For iOS developers, it's recommended to be equipped with Apple's iMac, it has a built-in software development environment which naturally supports all the functions needed as an iOS software engineer.



Fig3.1: Dell workstation and Apple iMac workstation

Mobile Devices

It is compulsory to have the latest version of mobile devices for the purpose of testing. Test engineers will need to test our FastForwards application on both latest mobile devices and older mobile devices in order to make sure it is capable on both versions of devices.

Software Environment

Java - Programming Language

JAVA is a programming language with advantages such as object oriented and so on. It allows us to maximise the capacity of our FastForwards application Server platform. Also, Java is a

worldwide popular programming language for application development over the server, which means the market has already proved its ability.

Kotlin - Programming Language

Kotlin programming language was officially assigned as Android development language at Google I/O 2017. The advantages of it over JAVA is that Kotlin allows developers to compile on JAVA code as well as JavaScript.

MySQL- Database Software

FastForwards Application will be using MySQL for Data storage. MySQL is a relational database management tool. For this particular case, MySQL is an ideal choice since the data will be assigned a unique address over the cloud. Also, it is important to store sensitive information by using MySQL, which guarantees security.

IntelliJ IDEA - Software development Tool

The IntelliJ IDEA is a software development tool that allows software engineers to write code in a more efficient way. This software supports built-in keyword reminders and function libraries. Developers can review the libraries while writing codes.

Android Studio - Software development Tool

The Android Studio is a software development tool that was initially released by google. It is the official android application development software published by Google, who is the inventor of Android. The benefit by using Android Studio is that it makes sure all of the code is working as the standards published from Google.

Support Tools

Azure DevOps - Microsoft Team foundation Server

Azure DevOps is a tool from Microsoft that allows project managers to assign either team or specific member tasks. It contains task name, task content, task estimate finished time and staff who are responsible for it.

Git - Code sharing

Git is a distributed version control system. Establishment of Git system shall allow our team to share codes, better control on application versions.

Email - Documentation sharing and records

Zoom - Remote meeting

Log - Mistakes collections

AWS performance monitor - Monitoring Server capacity

Deployment environments

The environment construction is mainly to build the server. The schematic diagram of our environment is as follows:

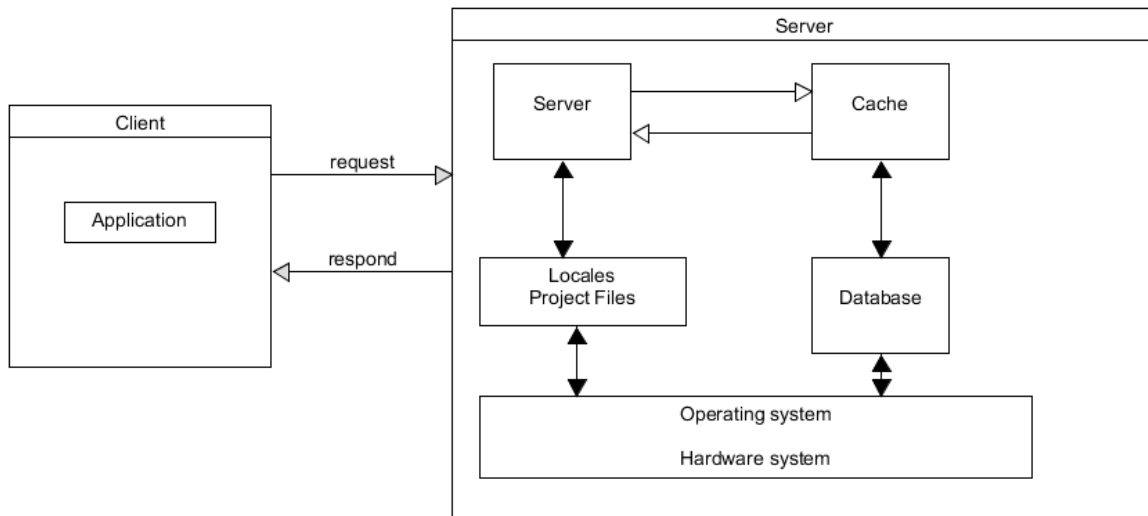


Fig4.1 Server Logic

Client: the user's entry terminal, such as mobile app

Server: The terminal that provides users with application services (also the core end of environment deployment)

It can be seen from the above figure that environment deployment actually mainly refers to the installation and combined use of the corresponding components of the server, that is, the structure of the server. To be familiar with the basic principles of project operation, you can become familiar with the basic components of the server.

Basic skeleton: basic support composed of hardware system and server operating system is required

Database application service: Provide a warehouse for data storage records for the system used by users, such as Mysql

Application services: application services that provide visual interface display and resource forwarding for browsers and other clients

System language environment: the development language environment component corresponding to the system that provides the service

Project file package: The source code file package (that is, the software system that provides services to users) prepared by the developer, such as the source code of our website, the source code of the app

Requirements analysis

1.Demand Description

Client operating system: Android

Client hardware device: Android

Software functional requirement description:

Function 1: Add friends and chat

Our software has a simple chat function, users can chat and share files by adding friends

Process description:

1 The user clicks to enter the app interface

2 Tap the screen

3 Use the keyboard for typing chat

The required development functions are: add user personal information, view friend list, chat



Fig5.1 lo-fi add friends

Function 2: File transfer

This is our most important part. Users can transfer files through this application, and the software has the authority to find the location of the files in the user's device, and send a notification after the user has successfully transferred.

Process description:

- 1 The user clicks to enter the app interface
- 2 Tap the screen
- 3 Use the keyboard for typing chat
- 4 Click on the chat interface to enter the phone file,
- 5 Filter files and share with users

The required development function is to find all the files on the mobile phone, allow users to add files and provide some basic controls and settings.

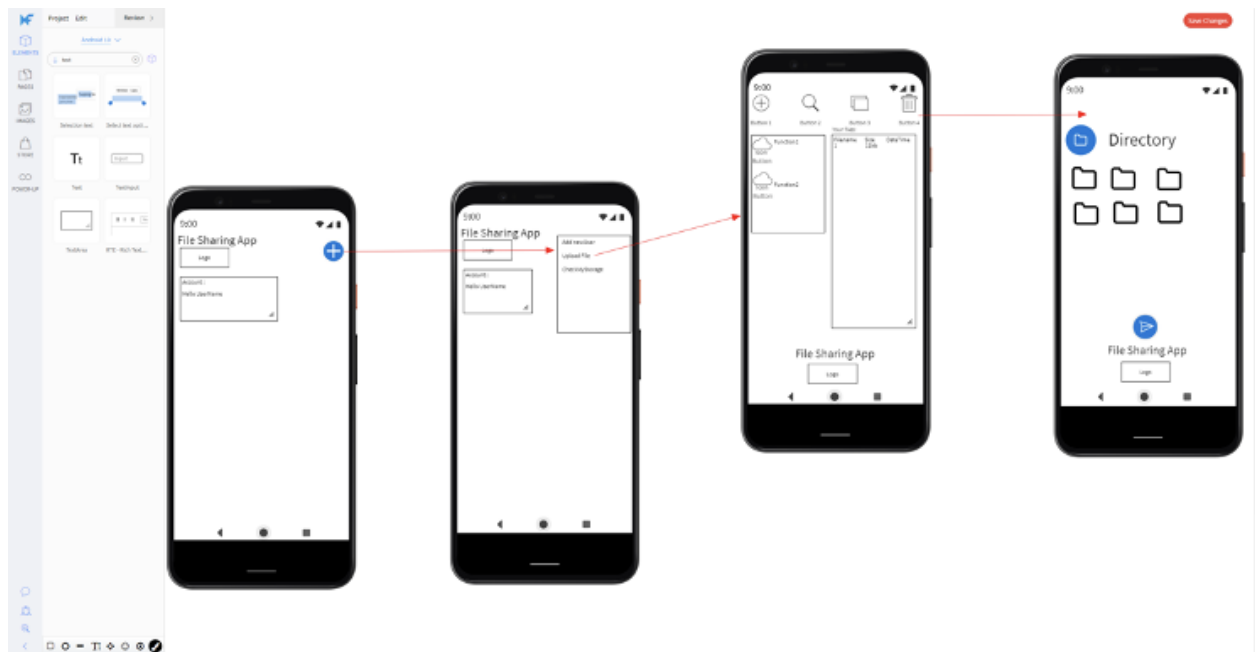


Fig5.1 file sharing

Function 3: Cloud storage, encryption

Photos stored in the cloud should be safe, and no one can open it without the consent of the original file owner.

The required development functions are: design a framework that allows users to use public blockchains to share files privately, manage user privacy settings, and encrypt sent files

2.User needs analysis

With the increasing frequency of people's lives and work in a mobile environment, the number of mobile phone users is also becoming more abundant. Now, for users, mobile phones are not

only a communication tool for making calls and texting, but also a part of daily life, entertainment, and work.

First of all, the main users of the software are divided into public officials. Because FastForwards (product name) has fast and easy-to-use functions, it can help users solve some file transfer problems. And it also has a strong security and cloud storage system

In many workplaces, many functions of the software can be used. For example, an employee of a company wants to share files with colleagues. FastForwards will be a good choice at this time. They can send files to each group member effortlessly via FastForwards. At the same time, the software's cloud system can protect files well. FastForwards will use file keys to encrypt files on the mobile phone client and store these keys to protect users' files.

The secondary users of FastForwards are the elderly and children. Because the frequency of their mobile phones is lower than that of people at work, but FastForwards is also a good chat software. It can help the communication between family and friends become more convenient, can initiate conversations quickly, saving a lot of time.

3.APP SWOT Analysis

<p>Strengths:</p> <p>Simple and easy to use</p> <p>High security</p> <p>Have a lot of resources</p>	<p>Weaknesses:</p> <p>Many similar products in the market</p> <p>Low profit</p>
<p>Opportunities:</p> <p>The continuous improvement of cloud technology and the continuous improvement of encryption technology</p> <p>The growing development of the Internet</p>	<p>Threats:</p> <p>Competitors is increasing</p>

4.Product function design

First, after opening FastForwards, you can see the user login interface, you can choose to log in or register a new account. We can click to enter the next screen. If you choose the login interface, this screen allows users to select the person they need to communicate with.

After clicking the chat button, you can use the keyboard to type and communicate or click the share file button in the upper right corner, and the user needs to go to the inside of the phone to select the file you want to share. When the user completes the selection, click the encrypt button at the bottom to complete the sharing.

When the user wants to add a friend, click the return button to return to the original interface, and click add friend at the top. The user needs to fill in the UserID of the other person, and then wait for another user to respond to complete the addition of a friend.

When the user wants to modify personal information, he can choose to click his own avatar, it will jump to the user's personal information interface, click the change button to complete.

5. Requirements list for stakeholders

Given below is the requirement list for stakeholder according to the stakeholder analyze from Assignment 1 (See Appendix)

Stakeholders	Requirements
The General Public	<ol style="list-style-type: none"> 1. The general public user shall be able to use this application over mobile devices 2. The general public shall be able to start conversation over this app 3. The application shall only allow sender and receiver to have permission to view , share ,operate the files 4. The fastforwards application should The fastforwards application

	<p>shall provide enough capacity and performance for the general public.</p> <p>5. The fastforwards application shall provide user-friendly UI design to the general public.</p> <p>6. The fastforwards application shall not share the public users' personal information to the third party.</p> <p>7. protect the security of public's user account and allow public's users to recovery their accounts with users' email or mobile number</p>
Company	<p>1. The company should be able to transfer sensitive file security.</p> <p>2. The software should ensure the transferred file can not be downloaded.</p> <p>3. The company should be able to have group chats with all staff.</p> <p>4. The software should ensure all the encrypted files can not be saved on the server.</p> <p>5. The company shall be able to give access to download or view the shared documents.</p> <p>6. The software should easily handle large files.</p> <p>7. The software shall insure less cost.</p>
School	<p>1. The School shall share teaching files safely and privately.</p> <p>2. Unauthorized teachers/students should not be able to view the files.</p> <p>3. Files must only store on the cloud securely.</p> <p>4. File sharing shall be user-friendly.</p> <p>5. Application shall protect teachers/students privacy.</p> <p>6. Cloud storage service shall provide large capacity to store files.</p> <p>7. Students should not be able to reshare files to the third party.</p>

Government	<ol style="list-style-type: none">1. The government shall need documents for fast transmission2. The government shall monitor such that the document cannot be forwarded to another party without the consent of the original document owner3. The government shall be able to ensure the security of files stored in the cloud4. The government shall the protect user privacy
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Conclusion

The main idea of this paper is to analyze the project requirements and it includes but not limited to marketing demands, user demands, strength and weakness research represented in SWOT analysis as well as development and deployment solutions.

During the analysis of the target market, a marketing research has been conducted towards different mobile application platforms such as Android and iOS and to the age of Users. In general, the trend is that more users turn to using Android instead of using iOS devices. This statistic strongly helped us determine which platform we should focus on most as well as our development. Meanwhile, considering the technique' difficulties, this paper also has done research on both development and deployment on Android devices. It is strongly believed that the biggest hurdle for this project is transmission security.

Besides, the market of file sharing applications is diverse. There are a variety of file sharing applications on application markets. Therefore, Design shall be kept updated in order to maintain competitiveness.

References

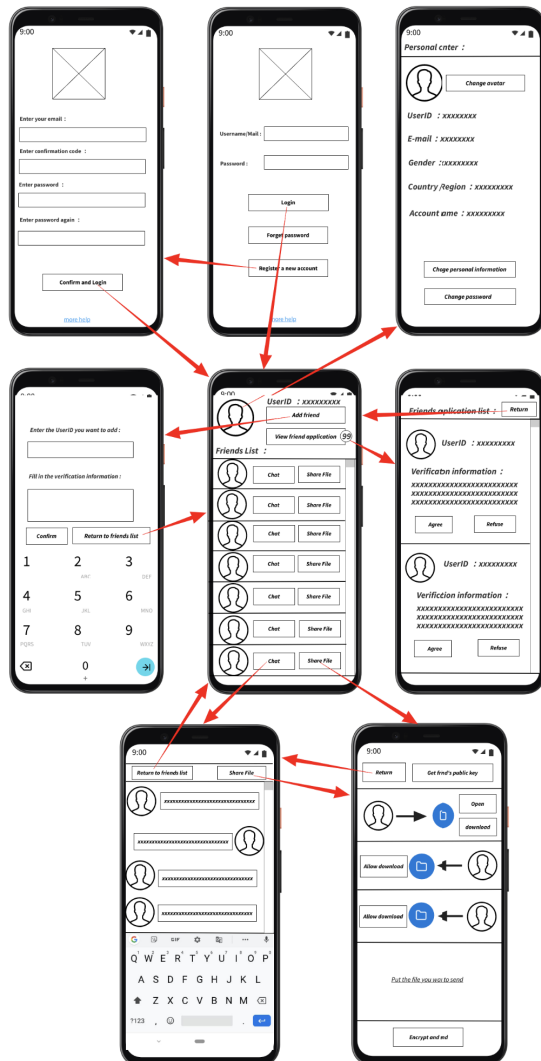
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Appendix

Lo-fi



Group Name

App+

Logo



Colours



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Stakeholders Analysis

Stakeholder	Contact	Impact	Influence	Importance	advantage
General public	Phone Website, Email,	Medium	Medium	For daily communications and file sharing	Greater security, Saves time
Company	Website, Email, Address	High	High	Company use for secure sharing importance files, colleague group communications	Greater security, Saves time, Greater accessibility, Reduce costs, Ability to handle larger files.
School	Website, Email, Address	Medium	Low	secure files sharing teaching docs.	Greater security
Government	Phone Website, Email, Address	High	High	secure files sharing	Greater security, Saves time, Ability to handle larger files, Reduce cost