



**Contextual Report**  
**Easy Prescription and Medication Reminder**

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**Submitted by: Salon Poudel**  
**Student ID: 1916261**

**Course Coordinator: Ajaya Sharma**  
**Supervisor: Sudhir Kumar**

**Abstract:**

Every day there is a growing number of smartphone users. Almost everything can be done using smartphones nowadays. There are a lot of mobile applications which help people with many things. This application is also a mobile application that assists the user in his medication process and also comes in handy in emergencies. This application is helpful for sick people. It reminds them to take their medicine every day at a specific time. We are living in a very busy period. Everybody is busy with their work. It is quite normal to forget to take their medicine. So, to solve this problem, this application was developed. It is a useful application to assist sick people who take on multiple medications daily. Missing the medication or not consuming it at a specific time can cause difficulty and medical complications. In that case, it is hard for the patient to contact in an emergency. This application provides the feature in which the user can send an alert to his emergency contact which is stored in the application by clicking an emergency button and the user will also be reminded every time to consume their medication. Due to the COVID restrictions and fear, many people choose not to consult their doctors like in pre-COVID times. Due to that many people could not get their prescription for the required medicine which caused serious problems. This application helps people to consult their doctors and get prescriptions through a single application. The doctor will upload the typed prescription which then will be converted to digitalized form using Optical Character Recognition (OCR) process.) Then the user can order the medication using the digitalized prescription. After that patients will be able to order their medication through the application.

Keywords: Medication reminder and tracker, alert to emergency contacts and doctor, prescription panel

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**Salon Poudel**

**1916261**

**BSc. CS & SE**

**PCPS College**

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## 1. Introduction

Due to technology, smartphones, and the internet we have everything at our fingertips.

Smartphones and the internet can be used to complete simple to extreme tasks easily. So, to take a step forward in this tech generation, an application is created which will help people to get prescriptions easily and will also remind the users to take their medication. So, this report shows the algorithms and the process of how the application will be developed.

In this tech generation, almost everything is done remotely. From foods to appliances, everything we need we just have to order and it arrives at our doorsteps. The same idea can be implemented in the process of getting prescriptions. Nowadays everyone has a smartphone in their hand. From small children to elderly people, everyone knows how to use it. Smartphones have also become advanced. We can use many applications for our convenience.

By developing this application, we are making it easy for the user to get a prescription. For getting the prescription, we will use Optical Character Recognition (OCR) which will digitalize the hand-written prescription and send it to the user which they can use to order their medication through any medium. This will make it easy for the user to get a prescription easily. They can also communicate with their doctor and discuss their health from the app itself. This application will also help in reminding the user to take their medication in time. In the current situation of the world, many people have some kind of problem regarding their health due to which they have to take their pills frequently. Maximum people have jobs and businesses which keep them busy due to which they often forget to take their medicine which can be fatal to their health. So, the application will help the users to get their medication easily and also assists them in taking their medication regularly.

### 1.1. Problem Statement

Many serious problems in this world affect us directly or indirectly. There is a serious problem of pollution, COVID and so on. These problems cause direct effects on our health. Due to these problems, our immune system is very poor due to which we get sick very easily. COVID is also a serious problem running in our world. It has made everyone's life difficult as people have to maintain social distance and stay in their homes if there is an outbreak in their society. Many of us suffer from a genetic health problem. Diabetes and high/low blood pressure have become normal nowadays which requires regular medication and consultation with doctors.

## 1.2. Proposed Solutions

The application "Easy Prescription and Medication Reminder" will help to solve the above-mentioned problems. The application will help the user get their prescription easily and to remind the user to take their medication regularly and on time. The application will also help the user get their prescription easily and safely during the pandemic and will regularly remind the user to take their medication in time and track the consumption of the medication as well.

## 1.3. Aim

Development of a mobile application to remind patients to consume their medicine and to digitalize the prescription process.

## 1.4. Objective

- To create a reminder system that reminds the user to consume their medicine.
- To make it easy for obtaining the prescription
- To notify the emergency contacts if the user is having any difficulties
- To keep track of medication consumption

## 1.5. Features

- App will remind the user to consume their medicine
- App will keep track of their medicine consumption
- App will send alert notification to emergency contacts in case of emergency
- Doctors can prescribe medicine within the application in digitalized form

## 1.6. Research Approach

Both qualitative and quantitative research will be done while completing the documentation. Quantitative research comprises experiments, observations recorded as numbers, and surveys with closed-ended questions, while qualitative research includes interviews with open-ended questions, observations described in words, and literature studies that investigate concepts and theories. (Streefkerk, 2022). After performing interviews, surveys, and research among focused groups, we have a brief understanding of the requirement of the project.

## 1.7. Structure of Report

Introduction	Introduction, Problem statement, proposed solution, aim, objective, features, research approach, the structure of the report, targeted user
Project Plan	Assignment plans, Gantt Chart
Literature Review	Major health problems, consultation with doctors, medicine consumption, mobile application, cross-platform applications, database, background and history of OCR, types of OCR, improving the accuracy of OCR, related mobile application
Market Research	Primary market research and secondary market research
Design of Artifact	Methodology, requirement analysis, design, evaluation
Conclusion	Conclusion of the report
Reference	The referred article, journals, blogs, websites, and books.

Table 1: Structured Report

## 1.8. Targeted Users

While developing any kind of product, developers must be sure about their targeted users. It helps to figure out what and how the users will use the product. Targeted users are the specific groups who are most likely to respond positively to your product. There are three types of users categorized Primary user, Secondary user, and Tertiary user.

### 1.8.1. Primary User

In the application, primary users are identified as patients as they will regularly use the application for their medication reminders.

### 1.8.2. Secondary User

In the application, secondary users are identified as doctors as they will use the app when they will have to upload a prescription or view the track of a patient's medication consumption.

### 1.8.3. Tertiary User

In the application, tertiary users are identified as the users that are in the emergency contact of the patient.

## 2. Project Plan

### 2.1. Assignment Plan

Tasks	Start Date	End Date
Finalization of topic	Jan 27	Jan 31
Title Discussion	Feb 1	Feb 7
Choosing Research Topic	Feb 15	Feb 21
Studying Relevant Topics	Feb 15	Feb 21
Proposal Submission	Feb 22	Mar 13
Contextual report started	Mar 13	Mar 13
Searching Journals	Mar 14	Mar 18
Supervisor Session	Mar 20	Mar 20
Draft Questionnaires	Mar 21	Mar 22
Supervisor Session	Mar 27	Mar 27
Introduction	Mar 28	Mar 30
Updated Questionnaires	Mar 28	Mar 28
Project Plan	Mar 29	Mar 30
Draft report started	Mar 30	Apr 2
Supervisor Session	Apr 3	Apr 3
Artefact and Methodology	Apr 4	Apr 7
Completed literature review	Apr 7	Apr 16
Supervisor session	Apr 17	Apr 17
Draft report finalization	Apr 17	Apr 21
Draft report finalization	Apr 21	Apr 21
Draft report presentation	Apr 24	Apr 24
Finalization of report	Apr 24	May 05
Report submission	May 06	May 06

Table 2: Project Plan

## 2.2. Gantt chart

A Gantt chart is a project management tool that helps with the planning of projects of all kinds, but it's especially beneficial for simplifying complex tasks. Timelines and tasks from project management are translated into a horizontal bar chart that displays the start and finishes dates, as well as connections, scheduling, and deadlines, as well as how much of the task is accomplished per stage and who is the task owner. Whenever there is a huge team and various stakeholders involved, this might help keep work on a schedule (Management), 2021). The above-shown picture is the Gantt chart for the development of this report.

easy prescription gantt					
Read-only view, generated on 20 Apr 2022					
	ACTIVITIES	ASSIGNEE	EH	START	DUe
	Section 1		-	27/Jan	06/May
1	Finalization of Topic		-	27/Jan	31/Jan 100%
2	Title Discussion		-	01/Feb	07/Feb 100%
3	Choosing Research Topic		-	15/Feb	21/Feb 100%
4	Studying relevant Topics		-	15/Feb	21/Feb 100%
5	Proposal Submission		-	22/Feb	13/Mar 100%
6	Contextual Report Started		-	13/Mar	13/Mar 100%
7	Searching Journals related t...		-	14/Mar	18/Mar 100%
8	Supervisor session		-	20/Mar	20/Mar 100%
9	Prepared draft questionaire		-	21/Mar	22/Mar 100%
10	Supervisor session		-	27/Mar	27/Mar 100%
11	Introduction and literature r...		-	28/Mar	30/Mar 100%
12	Updated questionnaires		-	28/Mar	28/Mar 100%
13	Project Planning		-	29/Mar	30/Mar 100%
14	Draft Report started		-	30/Mar	02/Apr 100%
15	Supervisor Session		-	03/Apr	03/Apr 100%
16	Artefacts and Methodologies		-	04/Apr	07/Apr 100%
17	Completed literature review		-	07/Apr	16/Apr 100%
18	Supervisor session		-	17/Apr	17/Apr 100%
19	Draft report finalization		-	21/Apr	21/Apr 0%
20	Draft report presentation		-	24/Apr	24/Apr 0%
21	Finalization of report		-	24/Apr	05/May 0%
22	Report submission		-	06/May	06/May 0%

Figure 1: Gantt Chart of Tasks

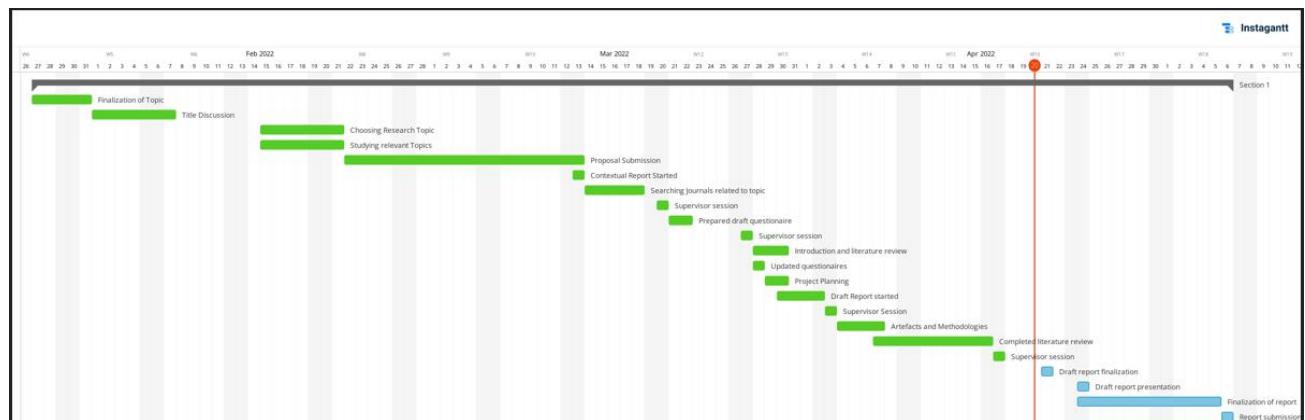


Figure 2: Gantt Chart Visualization

## 2.3. Work Breakdown Structure

In project management, a work breakdown structure (WBS) is a strategy for finishing a complicated, multi-step project. It's a strategy for breaking down large projects into smaller chunks and completing them more quickly and efficiently (Wrike, 2021). The work breakdown structure for the proposed application is shown below:

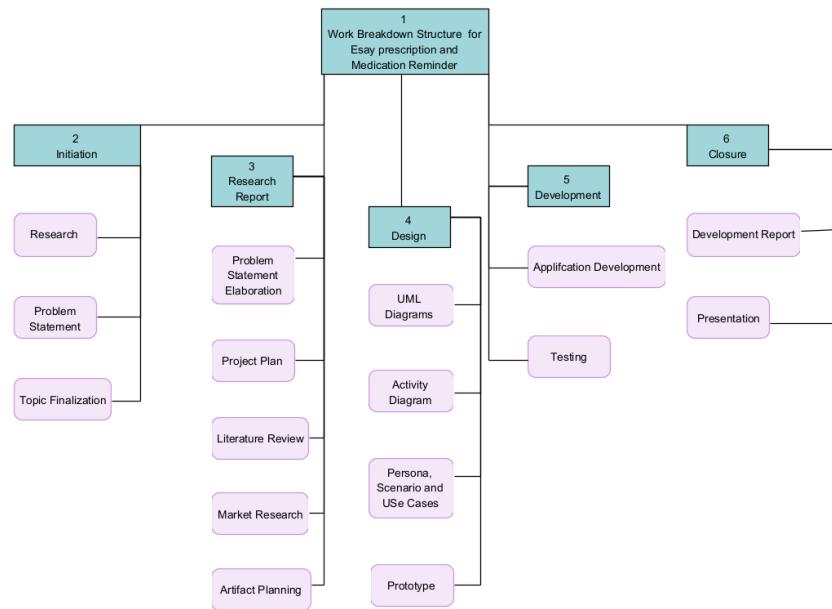


Figure 3: Work Breakdown Structure

### 3. Literature Review

A literature review is a survey of scholarly sources on a specific topic that provides an overview of current knowledge, allowing you to identify relevant theories, methods, and gaps in the existing research (McCombes, 2022). The literature review of this report is based on current health problems, people's approaches to tackling them, people's diseases and their medication, related mobile application, and OCR.

#### 3.1. Major Health Problems

Many people have a busy schedule due to which it is hard to take care of their bodies and most the people do not exercise to keep themselves fit and healthy. On top of that, the environment is also polluted. Every kind of pollution exists which are one of the main reason which causes health problems. According to WHO, Asthma, which is a respiratory disease that is mostly caused by air pollution is the reason for 461000 deaths in 2019 (WHO, 2021). Cardiovascular Diseases (CVDs) are the leading cause of death where 17.9 million people died in 2019 (WHO, 2021). Blood pressure is also one of the common diseases that exist in this world. 1.28 billion people suffer from elevated blood pressure and half of the adults (42%) with elevated blood pressure are unaware of their condition (WHO, 2021).

#### 3.2. Consultation with Doctors

Many diseases in this world affect people directly or indirectly. If people became ill, then they will go to doctors for their checkups. Due to the increasing number of diseases, doctors to patient ratio is decreasing rapidly. The highest doctor-to-patient ratio in the world is 5.32 doctors per 1000 people (Economy, 2019) in Austria. Nepal has a 1:1724 doctor to patient ratio which is very low and it makes it harder to make a doctor accessible for every person (Online, 2017). As there was a COVID breakdown and lockdown was implemented in almost all countries. Due to that, many people suffered because they were scared to go to the hospital and even if they wanted, the appointment list was very long along with the queue in the hospitals and clinics. Due to the increasing number of diseases and the low doctor-to-patient ratio, it will be much harder to get an appointment with doctors in the coming future.

#### 3.3. Medicine Consumption

As there are a lot of people who suffer from different types of diseases, they also use pills for their illnesses. There are around 275 million people who use prescribed medicine in the whole

wide world (Crime, 2021). The above figure shows the number of people who use prescribed medicine along with their age.

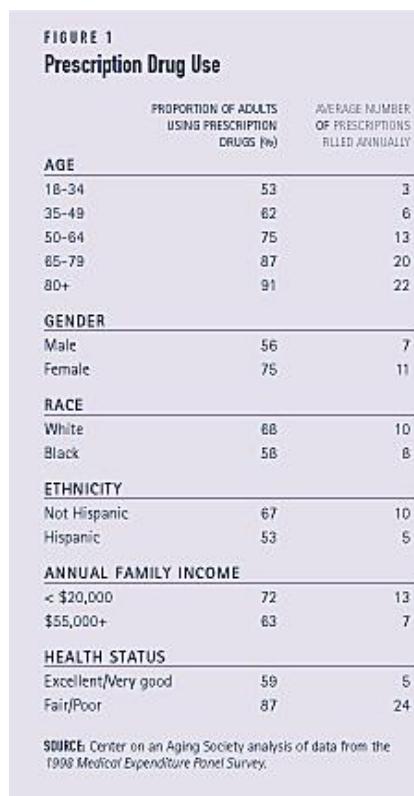


Figure 4: Prescribed medicine used by age

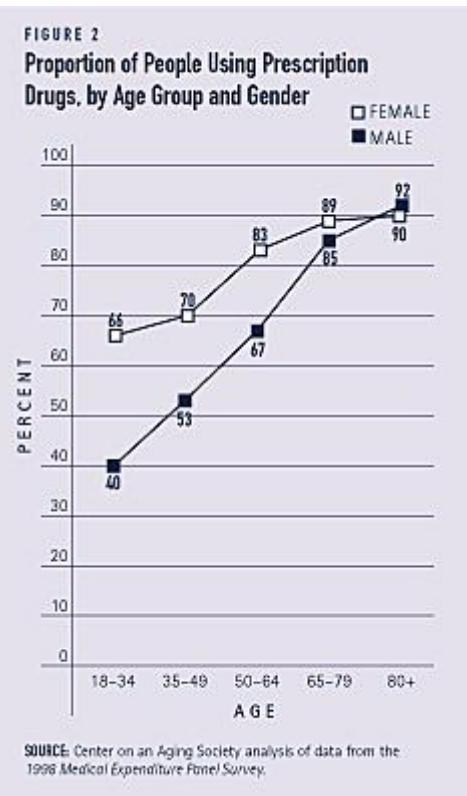


Figure 5: Prescribed medicine used

### 3.4. Mobile Application

A mobile application is a type of application software designed to run on smartphones or tablets. Most mobile applications are PC-based applications rebuilt to make them run on mobile phones. Mobile applications often serve to furnish clients with comparable administrations to those got on PCs and are by and large small, individual software units with restricted capacity (Pham, 2022).

There are three types of mobile applications based on technologies used for the development. They are Native Apps, Web Apps, and Hybrid Apps.

#### 3.4.1. Native apps

The application in which it is created and developed for a specific type of device platforms such as Android or IOS, using a specialized coding language is a native app. To build a native application, the coding language that is chosen by developers must be given access by the device platform. Some examples of native applications are offline mobile games, dictionary apps, etc (Pham, 2022).

#### 3.4.2. Web Apps

Web applications are accessed via the internet browser. Web apps can adjust to whichever device you view them on. They are not native to a specific framework and should not be downloaded or introduced and because of their responsive nature, they look and function a lot like mobile applications (Nguyen, 2021).

#### 3.4.3. Hybrid Apps

The hybrid app is an application that can be downloaded and installed on any mobile device by which users can play games, communicate with friends via social networks, take pictures, track health, etc. Hybrid applications are built on web technologies such as JavaScript, HTML, or CSS and can work on multiple platforms (Pham, 2020).

### 3.5. Cross-Platform App Development

Cross-platform application development is about building a single application that can run on various operating systems, instead of developing different app versions for each platform. It is one of the most popular app development as it has many advantages such as faster development time, reaching a wider audience, low cost, etc. (Brothers, 2020). The most popular cross-platform app development frameworks are Flutter, React Native, and Node.JS.

#### 3.5.1. Flutter

Flutter is Google's free, open-source software development kit (SDK) for cross-platform mobile application development which relies on a library of pre-made widgets

that make it simple for even people with limited programming or development experience to launch their mobile applications quickly (Karasabbas, 2022).

### 3.5.2. React Native

React Native is an open-source framework from Facebook which builds on the popular React JavaScript framework, allowing developers to create cross-platform iOS and Android applications using JavaScript (Bender, 2021)

### 3.5.3. Node.JS

Node.js (Node) is an open-source development platform for executing JavaScript code server-side which is useful for developing applications that require a persistent connection from the browser to the server and is often used for real-time applications such as chat, news feeds, and web push notifications (Denman, 2022).

Among all these frameworks, flutter was chosen for the development of the proposed application as it offers a wide range of benefits for the development which helps to develop a more user-friendly application. Flutter is easy to learn and easy to use and offers an excellent user experience.

## 3.6. Database

A database is an organized collection of structured information, or data, typically stored electronically in a computer system (Oracle, 2022). To complete an application, a good database is required to enhance the performance. Many databases exist and some of them are Oracle, MySQL, MongoDB, etc.

### 3.6.1. Oracle

Oracle is the most widely used database management system (DBSM). It takes up less space and processes data faster and includes several features. It has a built-in assembly language such as C, C++, and Java (Oracle, 2022).

### 3.6.2. MySQL

MySQL is the most popular database in the world, especially in web application development. It is written in C and C++ and uses a structured query language and in its newest version, it includes better recovery options (Mehta, 2022).

### 3.6.3. MongoDB

MongoDB is the first document database management software that was released in 2009. It is challenging to load and access data into RDBMS using object-oriented programming languages which also require additional application-level mapping so to overcome the problem MongoDB was developed (Mehta, 2022).

Along with the flutter framework, MySQL was decided to use as database storage as it is open-source and it includes better recovery options. It is quick and reliable to access and is also scalable. It can work easily with a small or large amount of data.

## 3.7. Online Prescription in Proposed Application

Online prescription is a practice of providing prescriptions to the patients through the internet which allows doctors to send prescriptions with the help of the internet without physically meeting with patients. From the research, there were prescription-making applications in which the doctor had to add everything manually. In the proposed application, the handwritten prescription will be digitalized using OCR (Optical Character Recognition) which can be edited in the future and will be accessible on the patient's mobile.

## 3.8. Background and History of Optical Character Recognition (OCR)

OCR(Optical Character Recognition) also known as text recognition is the process of digitalizing hand-written text and convert into machine-encoded text and enabling editing of the original document ((OCR)?, 2022). OCR is in practice since World War I. A physicist named Emanuel Goldberg invented the machine that could read characters and transfer them into telegram codes (Britton, 2019). Then in 1974, Ray Kurzweil's company named Kurzweil Computer Products, Inc. created Omni-font OCR which could recognize text printed in any font. Then OCR technology became popular in the 90s while digitizing newspapers and is used ever since. Now it is widely available to the public.

This section helps in understanding the history of OCR and how it got to the place it is now. It will develop more and will be at the next level in the coming future. In the coming future, many things will evolve and technology is one of them. OCR will play a vital role in the future.

### 3.8.1. Types of Optical Character Recognition (OCR)

Optical Character Recognition (OCR) is categorized into different divisions to distinguish fonts, hand-written texts, cursive texts, and type-written texts and compare with human input data. The different types of OCR are shown below:

- Intelligent Word Recognition

Intelligent Word Recognition (IMR) is a type of OCR that captures cursive or handwritten texts and recognizes entire handwritten words rather than individual characters.

- Intelligent Character Recognition

Intelligent Character Recognition (ICR) is a type of OCR that captures cursive or handwritten texts and recognizes a single character at a time.

- Optical Word Recognition

Optical Word Recognition (OWR) is a type of OCR that targets typewritten text word-wise.

- Optical Character Recognition

Optical Character Recognition (OCR) captures typed texts and targets typewritten texts and goes one character at a time.

- Optical Mark Recognition

Optical Mark Recognition (OMR) is a technique that uses human input data to recognize marks or patterns on a document.

### 3.8.2. Improving Accuracy of Optical Character Recognition (OCR)

- Pre-Processing

It is done to improve the accuracy of the OCR process. Some techniques of Pre-Processing are described below:

- De-skew: Handles the alignment of the image.
- Binarisation: Converts image into black and white
- Despeckle: Clear spots and soothes the edges
- Line removal: Clears extra spaces and lines
- Zoning: Separates extra lines and spaces
- Script Recognition: Recognizes texts in a documents
- Segmentation: Divides image artefacts into characters

#### ➤ Character Recognition

- Matrix Matching: Matrix matching recognition works by comparing the characters in images with the characters stored.
- Feature Extraction: Feature Extraction recognition works by recognizing lines, and directions and makes character recognition efficient.

#### ➤ Post Processing

Post-processing is done to increase the accuracy after data processing. Lexicon is an important role in the post-processing of OCR which is a list of words that can occur in documents.

(DocAcquire, 2019)

### 3.9. Mobile Application as Health Assistant

As technology keeps upgrading, the use of mobile apps is also increasing. There are a lot of things that people can do through smartphones. The mobile application plays a vital role in the use of smartphones. There is a lot of mobile application available on the internet. There are almost 1.96 million apps available in Apple App Store whereas 2.87 million apps are available in Play Store as there are 6.3 billion smartphone users in this world (Buildfire, 2022).

Mobile applications are also helping a lot in the health sector. There are more than 350,000 digital health apps available on the internet (Kapoor, 2022). The application is not only helping patients but also doctors, nurses, medical technicians, and other professionals. These applications are making the lives of every medical professional and patient easier. These apps give fast and easy access to medical professionals. It will help the patient as they will not have to travel to the professionals for visit and will not have to change their plans. These applications will also help medical professionals as they can monitor if their patient is taking their medication or

not. As doctors and patients can consult with each other virtually, it makes remote monitoring easy for the doctors as well as tracking the condition of the patients.

### 3.9.1. Proposed app as a Health assistant

The proposed application is called the easy Prescription and Medication Reminder Application. The application can be used to get a reminder for their medication. Multiple reminders can be set as a person can have more than one illness and that requires multiple reminders. It will also help in getting the prescription the easy way. The proposed application will be a great help for the patients and doctors as it will keep track of the medication of the patient and through which doctor can monitor his patient virtually.

## 3.10. Literature Review Analysis

Different types of research were completed for the literature survey part. First of all, different research papers have analyzed the confirmation of the topic and the research papers are shown in the bibliography part. After the research, it was clear that the proposed software will be a mobile application. So, for mobile application development, different types of languages and frameworks were studied and Flutter was selected to make the application better. For the database, MySql was finalized because it is easy, effective, and has better recovery options. And for the prescription part, OCR will be implemented. It will scan the image and change it into text. OCR was used because it will be effective and will have high accuracy as measures to increase the accuracy were also studied. The application will play the part of health assistant to various people. So, a topic where Mobile Application as Health Assistant was added, and research was done to find out how effective the application will be and how many people will use or already use this type of application.

## 4. Market Research

### 4.1. Primary Market Research

Primary market research involves gathering primary data — information obtained directly from a customer or consumer. It can be done through a range of market research methods, including surveys, focus groups, personal interviews, observations, and field trials. Primary market research feeds into secondary market research, which uses previously collected data.

#### 4.1.1. Survey Questioners with results analysis

##### 1. Doctor or patient?

The question was asked to get the idea of whether the responder is answering from a patient's view or a doctor's view. The response shows that 76.5% of the responders are patients or relatives of a patient whereas 23.5% of the responders are doctors.

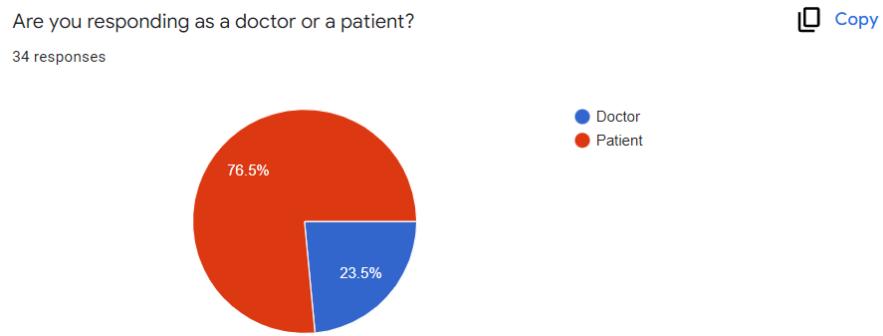


Figure 6: Question 1

##### 2. Age Group?

The question the age was asked to get to know how many targeted age groups responded to the survey.

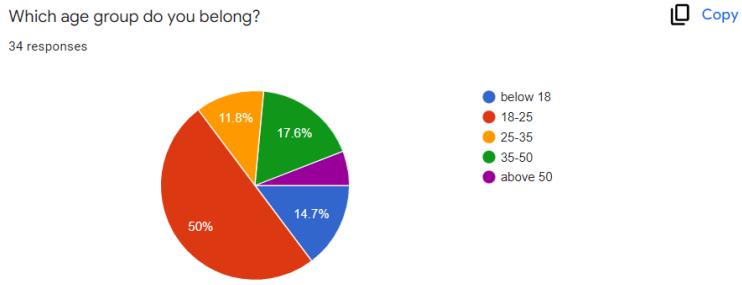


Figure 7: Question 2

### 3. Medicine Consumption?

The question of medicine consumption was asked to know if the responder or someone in their family consumes medicine daily or regularly.

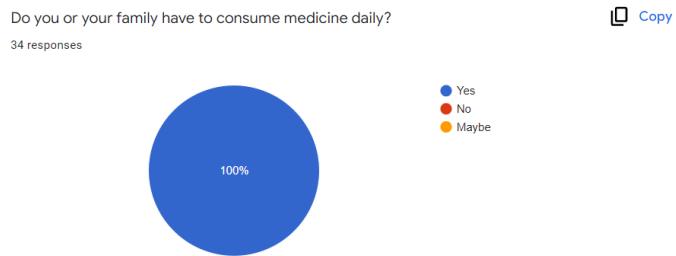


Figure 8: Question 3

### 4. Prescription type?

The question was asked to know the type of prescription which are used by the responders. After the survey, we got to know that many of the responders use the hand-written slip of prescription whereas 33.3% use photos and 11.1% people use digitalized prescriptions.

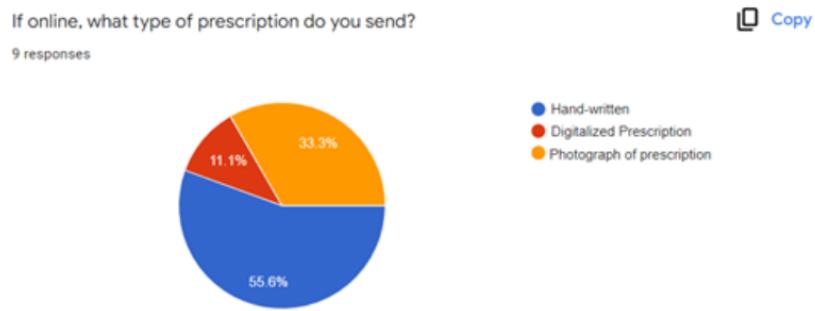


Figure 9: Question 4

5. The number of medicine consumption?

The question was asked to know how much medicine the responder or their relative consumes in a day.

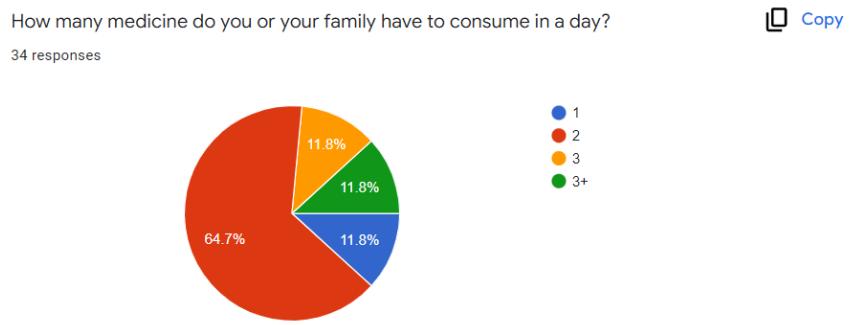


Figure 10: Question 5

6. How often do you forget about taking your medicine?

The question was asked in the survey to know whether the responder or their relative forgot to take their medicine.

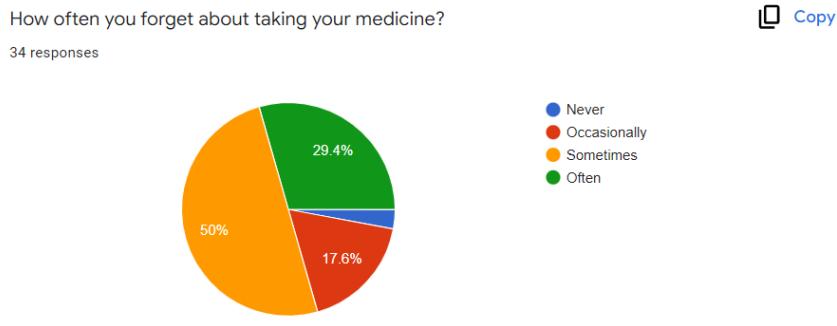


Figure 11: Question 6

## 7. Doctor Consultation?

The question was asked in the survey to know how many people consult with their doctors in what interval of days.

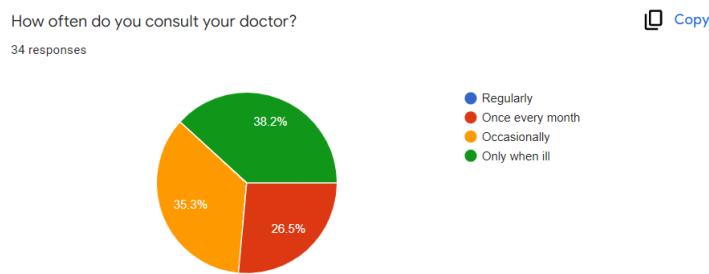


Figure 12: Question 7

## 8. Prescription type from doctors?

The question was asked in the survey to get to know the type of prescription the responders get after visiting the doctors.

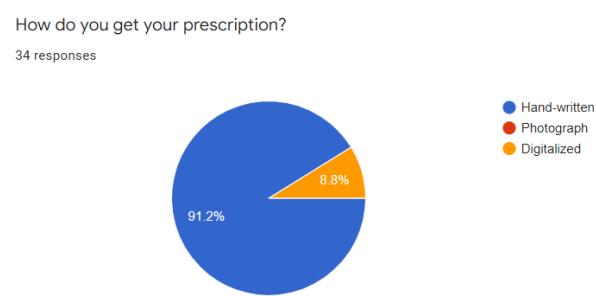
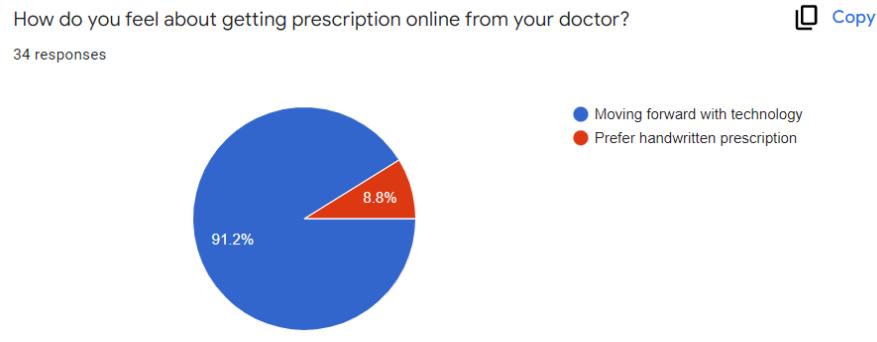


Figure 13: Question 8

9. Getting an online prescription?

The question was asked to know the opinion of the responders about the online prescription in digitalized form. More than 90% of responders replied positively.



*Figure 14: Question 9*

10. About the proposed application?

The question was asked to know if the responder will use the proposed application with the mentioned features and 91.3% of the responders said yes and others replied maybe.

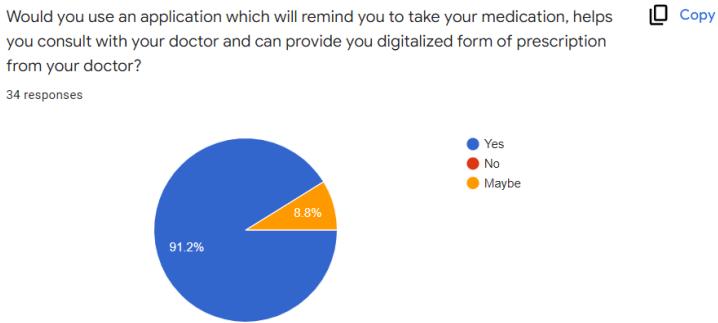


Figure 15: Question 10

#### 4.1.2. Primary Market Research Analysis

According to the results of the survey, many people consume medicine daily and some of them have to take more than one medicine in a day. Due to the busy life in this current time, it is normal to miss a medicine. According to the survey, some people miss their medicine occasionally whereas some patients often forget to take their medicine.

According to the survey, many people will like a digitalized prescription from an application. After the response from the survey, many things became clear about the application. Almost everyone preferred the application as a helpful application and responded positively. There was a question in which we asked the user if they want any other additional features or a suggestion and the response if the question was:

- Good UI designs
- Ordering the medicine from the application
- Location of the person who clicked the emergency button
- Symptoms checking page

From the primary market research, some information was gathered and will be used while developing the application. As the targeted age group for the application is about 35+, the

user interface of the application will have to be very easy and comfortable as the majority of the targeted age group is new to the technology and the application must have a comfortable user interface for the targeted age group to use. There was some suggestion in the survey that were excellent and those suggestions will be considered while developing the application.

#### 4.2. Secondary Market Research

Secondary market research includes data that is already compiled and organized. Examples of secondary information include reports and studies by government agencies, trade associations, or other businesses within your industry. It uses outside information assembled by government agencies, industry and trade associations, labour unions, media sources, chambers of commerce, and so on. It's usually published in pamphlets, newsletters, trade publications, magazines, and newspapers (djsresearch, 2022)

#### 4.2.1. Trend Analysis

Trend analysis of the proposed application is done with the help of Google trends. Google trends is an online searching tool that analyzes the portion of Google searches and shows how many searches have been done on Google which is updated daily.

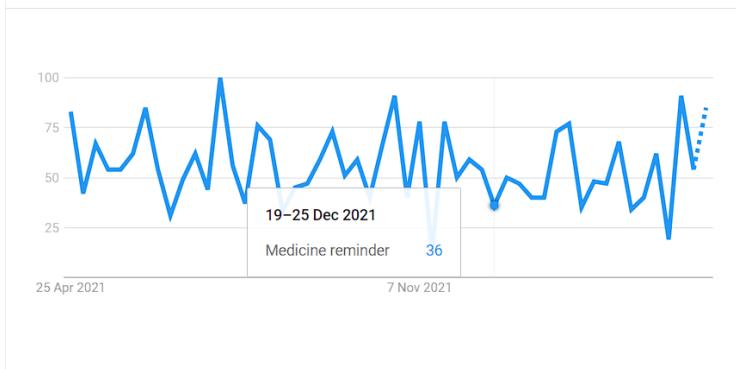


Figure 16: **Medicine Reminder** trend analysis (Google, n.d.)

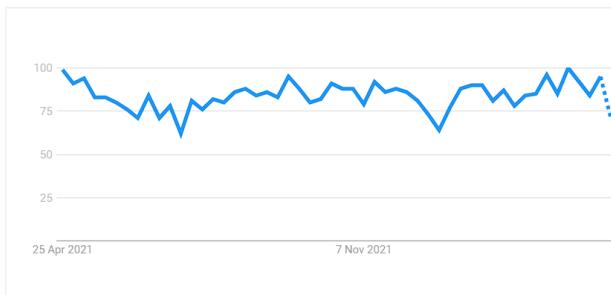


Figure 17: **Prescription** trend analysis (Google, n.d.)

As illustrated in the graph, Medicine reminders and Digital Prescription Maker are always on the rise. Although the graph shows a variance in the number of people looking for food management solutions, people all around the world are still interested in learning more about them and looking for a solution to assist them in their health and medicine consumption.

#### 4.2.2. Browsing similar applications

Google play store is filled with different types of applications. There are 2.87 billion applications available in the play store (Buildfire, 2022). So, Google Play Store was used to know how many applications are there in the play store which are related to our proposed application.

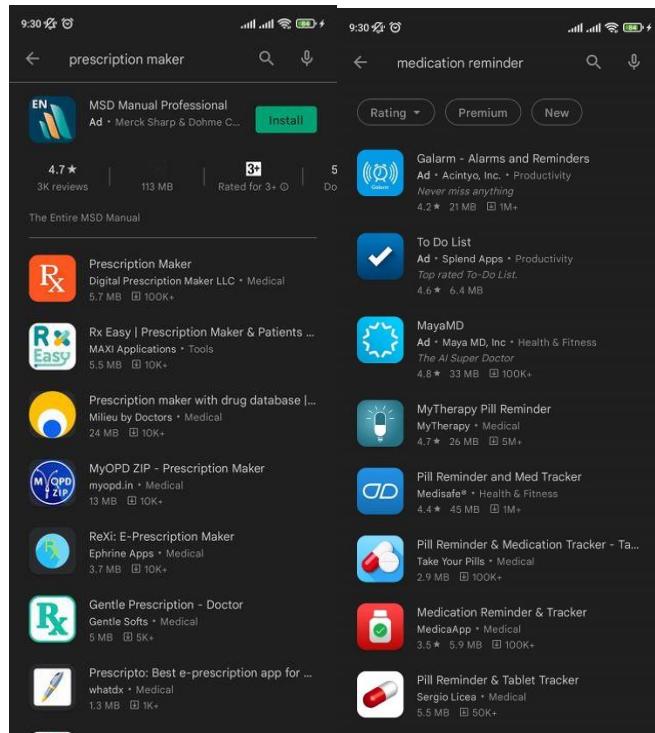


Figure 18:Related application in google play store (Anon., n.d.)

#### 4.2.3. Reviewing Related Applications

- MyTherapy pill reminder

MyTherapy pill reminder is a mobile application that reminds the user to take their medication regularly. In this application, you can view your pills, track your medication history, print your health report, and can also help in symptom checking.

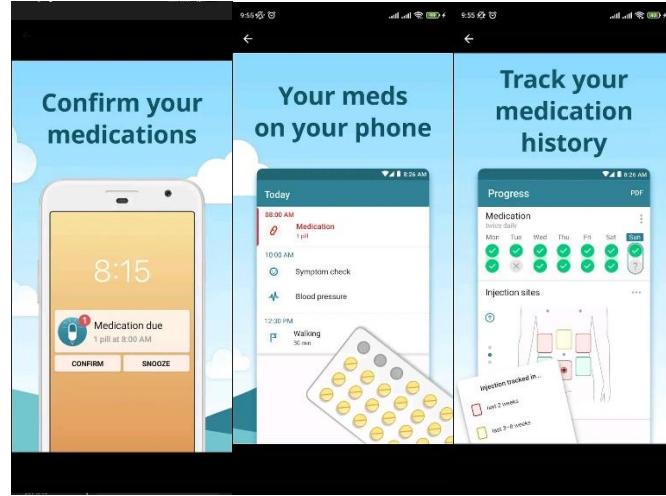


Figure 19: MyTherapy pill reminder app (MyTherapy, 2022)

### 1. Technologies used

The application is a flutter-based application that is available on both Android and iOS. The smartphone is necessary to use the application.

### 2. Pros

- Good user interface
- Medication tracker is available
- More than one reminder can be added
- Easy to use

### 3. Cons

- Difficult to turn off the reminder
- Bad notification system

#### • Pill Reminder and Med Tracker

Pill Reminder and Med Tracker is a mobile application that reminds the user to take their medication regularly. In this application, you can view your pills and track your medication history.

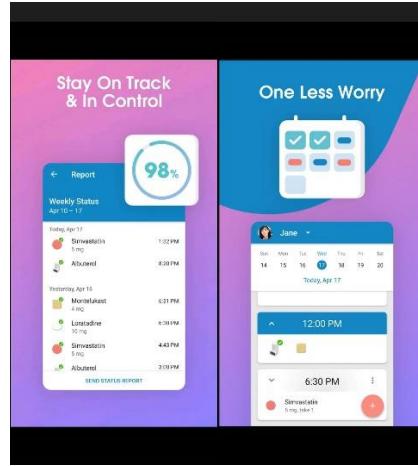


Figure 20: Pill reminder and med tracker (Medisafe, n.d.)

### 1. Technology used

This application is also developed using the flutter framework and is also a cross-platform application.

### 2. Pros

- Good User Interface
- Easy to use
- Repetition of reminder
- Multiple reminder system

### 3. Cons

- Interrupts the app while a reminder is on
- Long process to access health tracker

#### 4.2.4. Secondary Market Research Analysis

As per the secondary market research, there is a high demand for mobile applications related to health assistants. People tend to seek to assist with the application regarding their health problems. According to research, there was a lot of application developed and are in the Play Store but people mostly use MyTherapy Pill Reminder, Pill Reminder, Med Tracker, and Prescription maker. All these applications were at the top of the search bar and have a good rating with a high number of downloads.

After the results, it was found that Pill Reminder and Med Tracker, and MyTherapy pill reminder are doing a great job in their field. Those were some best applications for medication reminders on the internet. The reviews for the applications were good and downloads were also high. The applications are helping people by reminding them to take their pills and keep track of their pills. Also, after some research and searching on the Google play store, there was not many prescription generator application available. Out of the available applications, the prescription was more like a blank form. So, The Easy Prescription and Medication Reminder are two different topics adjusted to make one single unique application that users can use for their prescription and reminding their medication. As there was an outbreak of the COVID virus, there was a mandatory rule of social distancing and due to that visit to doctors was a hard procedure. Many people did not get a chance to consult with their doctor because of the long line of appointments. The application helps in these times as it reduces visiting time and can provide digitalized prescriptions at any place.

## 5. Design of Artifact

### 5.1. Methodology

Agile software development technique is used in the production of this project as it is a repetitive approach to project management and software development that helps a team to deliver their products to their customer faster. With agile, any change can be done in any part of the project without altering the project plans. Agile Methodology is a practice that promotes continuous iteration of development and testing throughout the software development lifecycle of the project (Hamilton, 2022).



Figure 21: Agile Methodology (nvisia, 2020)

### 5.2. Requirement Analysis

Requirements Analysis is the process of defining the expectations of the users for an application that is to be built or modified which involves all the tasks that are conducted to identify the needs of different stakeholders. Therefore requirements analysis means analyzing, documenting, validating, and managing software or system requirements (ReQuest, 2018). Requirement analysis is done in the early phase of the development process to ensure the final product has all the requirements. The functional and non-functional requirements of this project are listed below.

### 5.2.1. Functional Requirement

S.No	Description of Requirements
1	Users must be able to register and login into the system.
2	The user must be able to set a required number of reminders.
3	The user must be able to add emergency contacts.
4	The user must be able to send an alert by clicking a button to the emergency contact.
5	Users must be able to chat with their doctor within the application.
6	The doctor must be able to upload the photo of the prescription and digitalize it.
7	The user must be able to download the digitalized prescription.

*Table 3 Functional Requirement*

### 5.2.2. Non-Functional requirement

S.No	Description of Requirements
1	The system should be accessible to everyone.
2	The system should be user-friendly.
3	The system should be responsive and be as smooth as possible.
4	The system should be able to manage all the users.
5	The system should be properly managed.
6	The system should be regularly updated.
7	The system should not have any failures when users try the application.

*Table 4: Non-Functional Requirements*

### 5.2.3. Resources

Hardware	Intel Core i7 processor 8GB RAM 256GB SSD
Software	Flutter Android Studio MySQL Visual Studio IDE Python for OCR Adobe XD for prototype Visual Paradigm for system diagrams

## 6. Design

### 6.1. UML Diagram

A case diagram depicts how a user might engage with technology. A use case diagrams represent the system's various use cases and user categories and are typically augmented by other types of diagrams.

## Use Case Diagram

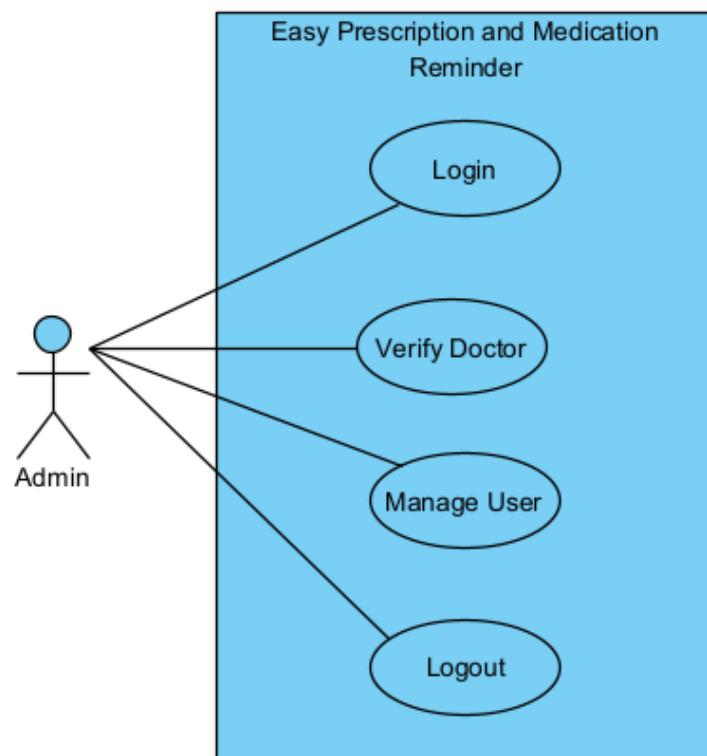
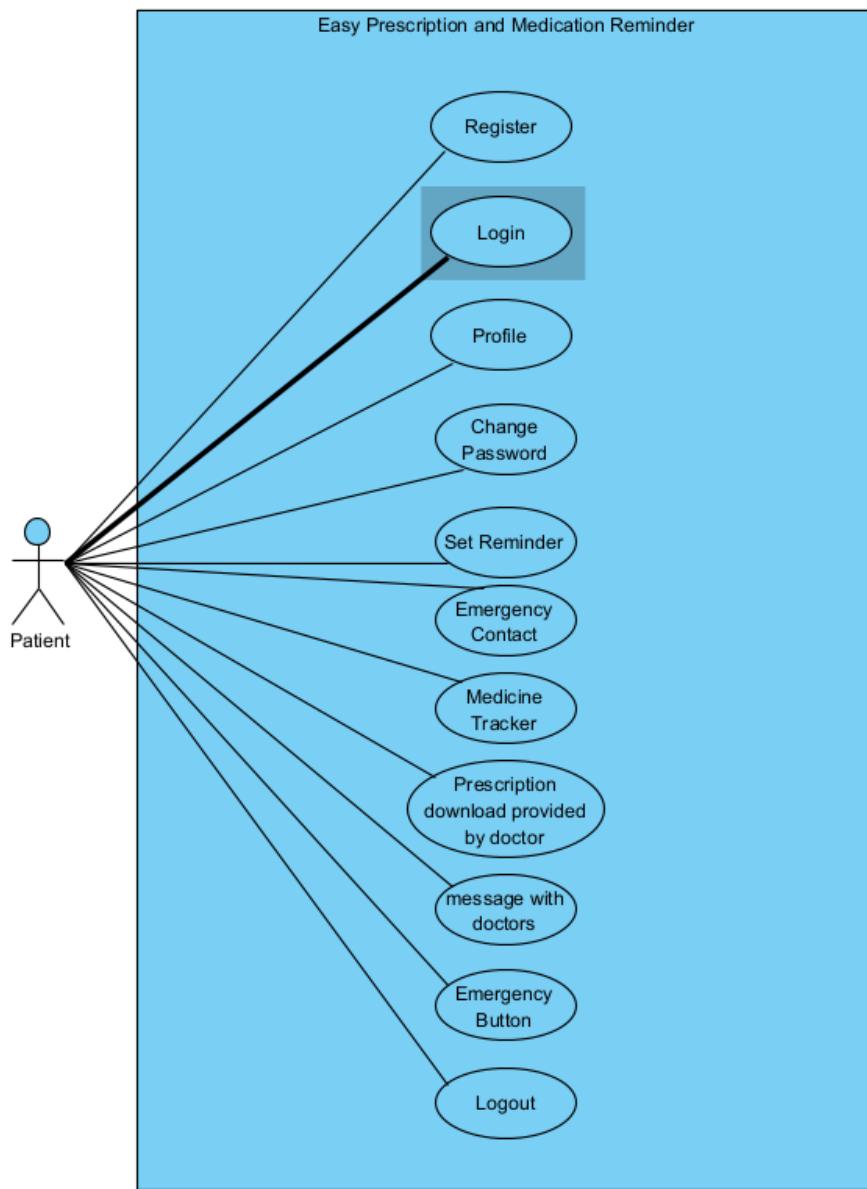


Figure 22: Use Case diagram of Admin

The system admin can access the data of the system and is also responsible for verifying the doctors to make sure the doctors are eligible to give prescriptions to the patients.



*Figure 23: Use Case Diagram of Patient*

Patients have to register before using the application and after the registration, patients can use the application to set a reminder for medication, add emergency contacts, track their medicine consumption, download the prescription given by doctors, follow up with doctors through text messages, access to the emergency button which will send alert to emergency contacts by clicking a button.

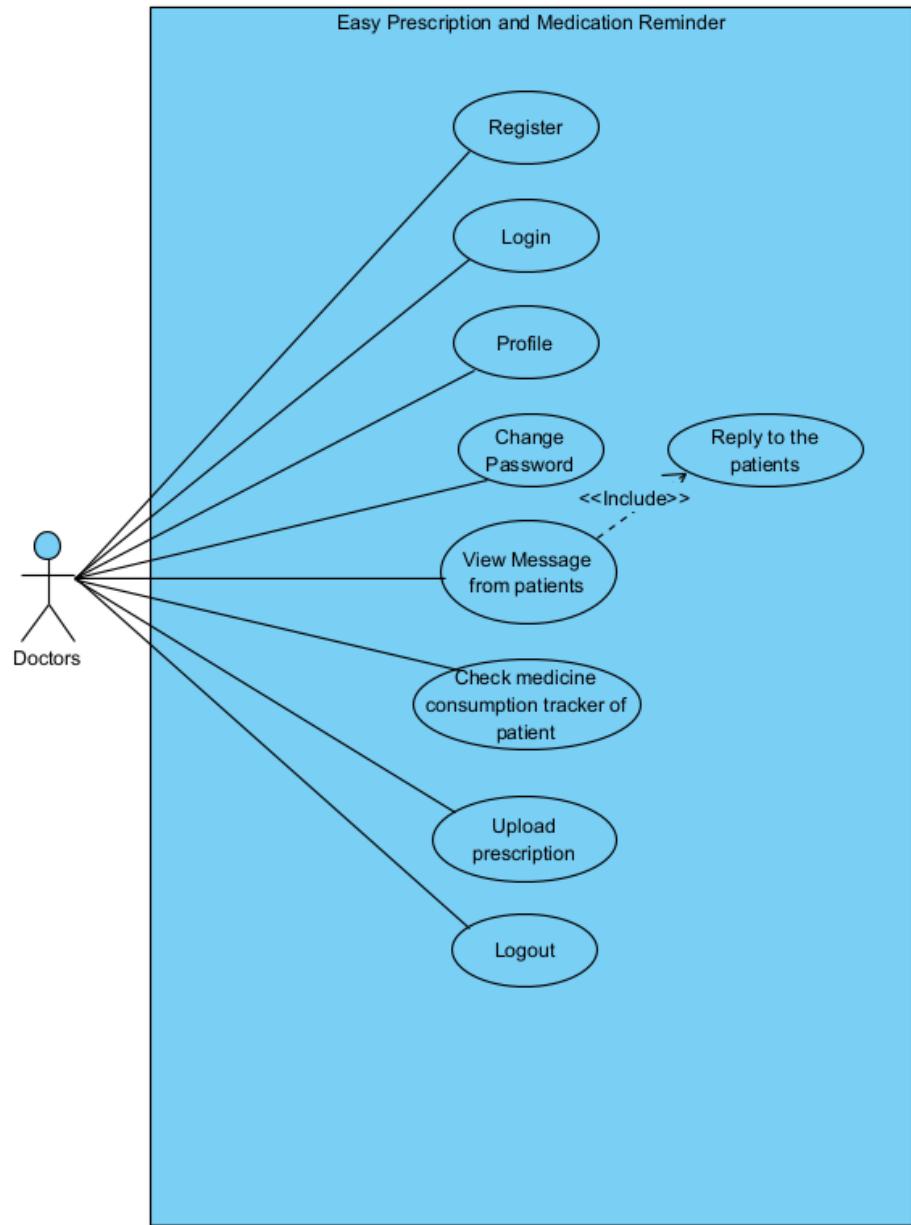


Figure 24: Use Case Diagram of Doctors

Doctors have to register first by uploading valid documents and will only be registered successfully if the admin approves the documents. After successful registration and logging in, doctors can reply to the messages of the patients, check the medicine consumption tracker of the patients, and upload the prescription for a patient.

## 6.2. Activity Diagram

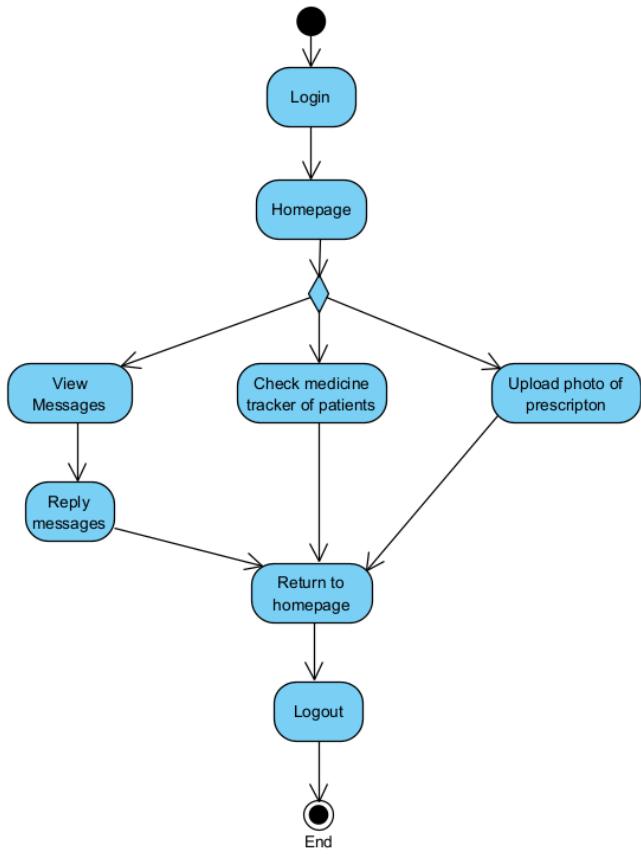
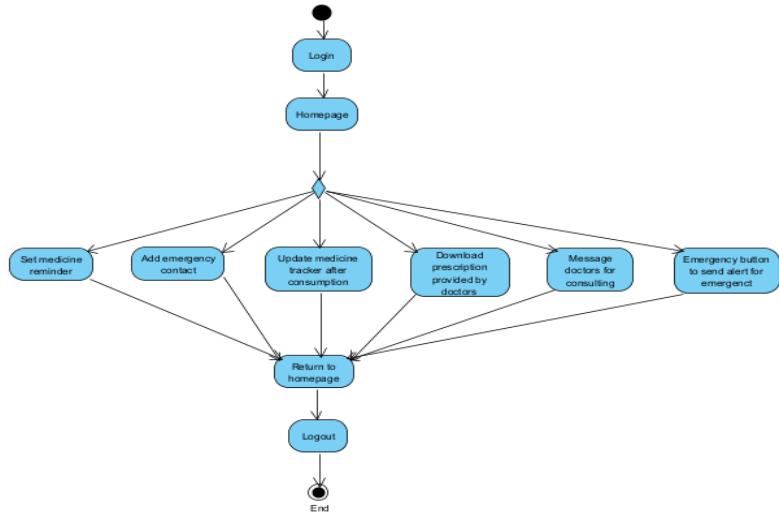


Figure 25: Activity Diagram for Doctors

The above-shown picture is an activity diagram for the doctors. It begins with logging in to the application. After logging in, the user will be able to view and reply to the messages, check the medicine tracker of patients, and upload the prescription for patients to download.



*Figure 26: Activity Diagram for Patients*

The above-shown picture is an activity diagram for the patients. It begins with logging in to the application. After logging in, the user will be able to set the medicine reminder, add emergency contacts, update the tracker every day after medicine consumption, download prescriptions provided by doctors, message doctors for consulting, and use an emergency button in case of an emergency which sends alert to the emergency contacts.

### 6.3. Personas, Scenarios, and Use cases

Personas are fictional characters created based on research to represent different types of users who might use the application in different ways. By designing personas, the designer can gain a greater understanding of people's wants, experiences, behaviours, and ambitions. Scenarios are descriptions of potential future actions or events for the personas, as well as how those users interact with the application in those scenarios. It's widely used to figure out what motivates users and also how developers might help them achieve their goals with the program. When a consumer has a problem, it also supports engineers in offering appropriate remedies. Use cases are tasks that have been broken down into steps depending on a scenario. Two personas were created with their scenarios and use cases which are described below:

## **Persona 1**



Amy, a 34-year-old accountant who works for a well-reputed company is seeking assistance to take her medicine in time.

### **Scenario for Amy**

Amy is very busy with her work and she must consume medicine daily as her illness is serious. She is so busy with her work daily that she often forgets to take her medicine in time and has to visit a doctor to consult about the missing dosage. She is quite annoyed with herself as she has to visit her doctor every time she misses her medication.

### **Use Case for Amy**

- She installed the application after the doctor's suggestion.
- She opens the application and registers in it.
- She sets a reminder for her medication.
- She consults with her doctor through the application after missing her medication and can also see the track of her medication.
- She gets notified whenever she has to take her medicine.
- She logs out of the system.

## **Persona 2**



Raj is a 35-year-old doctor who is engaged with a big hospital and also has his clinic.

### **Scenario for Raj**

Raj is mostly occupied with his job at the hospital and the clinic. He treats many people a day in the hospital and his clinic as well. He has a large number of appointments every day. He tries hard to finish all his appointments as soon as possible to make him more accessible.

### **Use Case for Raj**

- He finds the application through the advertisements.
- He downloads and registers as a doctor in the application.
- He then refers the application to his patients.
- He then interacts with his patients through his phone for minor illnesses.
- He sends the prescription to his patients through the application.
- He logs out from the application.

## 6.4. Prototype

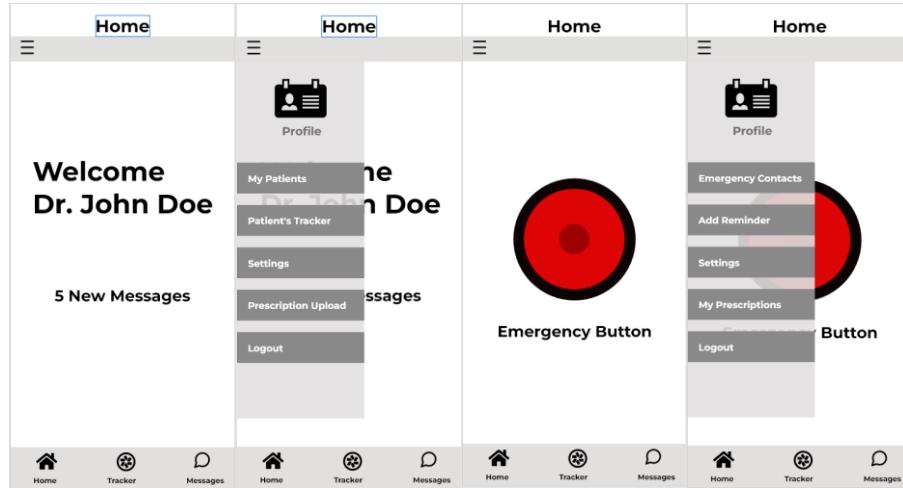


Figure 27: Homepage for Doctor

Figure 28: Homepage with a menu for doctors Figure 29: Homepage for patients Figure 30: Homepage with a menu for patients

A prototype is a product sample, design, or release that is used to test a concept or process. These prototypes were created using Adobe XD. Simple and user-friendly prototypes were created. The feedback was used to create this prototype which was acquired via survey and the data gathered from the survey. The above-shown prototypes are of the homepage of doctors and patients. Every feature was tried to adjust on the homepage to make them easy to access and easy to use. Other prototypes are shown in the appendix section.

## 6.5. Testing

Testing is the process of examining and verifying software to see if there are any errors and if it meets the criteria or not. Testing helps to examine the software for bugs and flaws and also helps to check if the requirements have been met or not. The testing methodologies for the proposed application are:

#### 6.5.1. Unit Testing

The testing methodology that will be used in the development phase will be unit testing. Unit Testing is a sort of software testing that examines individual software units or components. The goal is to ensure that each unit of software code works as intended. Developers perform unit testing during the development (coding) phase of an application. Unit tests are used to isolate a section of code and ensure that it is correct. A singular function, method, procedure, module, or object might be considered a unit (Hamilton, 2022).

#### 6.5.2. Integration Testing

Integration testing is a sort of software testing where a software application's various units, modules, or components are tested as a single entity. Integration testing is used to examine the interfaces between modules and uncover any flaws that may develop when these factors are integrated and must communicate with one another.

#### 6.5.3. User Acceptance Testing

User Acceptance Testing is a type of testing in which the end-user or customer verifies and accepts the software system before deploying it in the production environment. UAT is completed at the end of the testing process.

### 7. Evaluation

The final analytical procedure in the development of any software is evaluation. It involves an assessment of the entire project and a determination of whether the software fulfils the required performance standards. It also assures that the software is of the greatest quality and that it meets the needs of consumers and/or clients. The DECIDE framework will be used to assess this in this project. It's a manual that includes a general checklist of things to look for while planning a good review. The evaluation procedure is written like this:

- D – Determine the goals

Determine what has to be done to create a helpful platform for individuals to assist in their health and make sure the users remember to take their medication.

- E - Explore the questions

Look into the following questions:

- Does it achieve its goals and objectives?
- Does it address all issues/difficulties?
- Is it easy to use and understand?

- How can it be improved?
- C - Choose appropriate methods
 

The prototype is evaluated at two stages: during development and after completion. In the prototype, a simple and rapid method of getting feedback via focus groups and interviews.

Their reviews will reveal their initial impressions of the application and user experience, allowing the project to concentrate on quality and improvement.

Another evaluation is carried out using the usability testing method. It's done by having primary and secondary users interact with the software and fill out a survey about their experience. This helps you to see how the app works for users in real-time and spot any issues which may have gone overlooked previously.

Changes and/or additions to the program will be made in revised form, and these will be referred to as 'changes.'
- I - Identify the practical issues
 

During the process of any software development project, practical issues such as users, timelines, money, and others may occur. In this project, the primary focus is on the target users. It's best to spot them early on so that they're being kept informed and involved throughout the development process. Other key obstacles include obtaining reliable information, internet availability, and the project's deadline.
- D - Decide on the ethical issues
 

The privacy of the application's users is the main ethical issue that may arise. All data must be kept private, and information security should be strictly enforced. Inappropriate management may result in extra-legal difficulties, which is why one of the system's top responsibilities is ensuring that users feel safe while using the app. Participants in every survey or interview will be informed about the research and what they may expect from it. They also have the power to formally withdraw and end the examination at any time.
- E - Evaluation, analyze, interpret, and present the data
 

The vast majority of the data for this project comes from survey results. These will be investigated and presented as graphs and publicly accessible analyses. Durability, validity, errors, scope, and ecological validity are all important considerations.

## 8. Conclusion

The report is completed by deeply analyzing the Optical Character Recognition (OCR), studying and researching other related applications. The research shows that many people show interest in these types of applications. From the market research and surveys, some other ideas were gathered to update the application. The application will provide the features such as medication reminders, a medication tracker, an emergency button, consulting with doctors, and a prescription uploading feature for a doctor to digitalize the prescription. The developed application will be user-friendly and will be developed using the flutter framework and MySQL for the database. For the testing process, unit testing will be done to minimize the failure risk and to catch bugs early in the development phase.

In conclusion, this report consists of details obtained from doing research, surveys, and required information for the development of the proposed application. Much similar application that exists have similar concepts but does not have the features in a single application. After using and analyzing the application, several flaws and places for improvement were found. Reviews about the application were also analyzed and those reviews will also be considered while developing the proposed application.

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## 10. Appendix

## 10.1. Proposal Form

### BSc Project Screening Form: Guidelines

#### Part 1 – Project Proposal

<b>Student Name</b>	Salon Poudel
<b>Student Number</b>	1916261
<b>Degree Pathway</b>	BSC, Hons Computer Science and Software Engineering
<b>Supervisor Name</b>	Sudhir Kumar
<b>Course Coordinator name</b>	Ajaya Kumar Sharma
<b>Title of Project</b>	Easy Prescription and Medication Reminder
<b>Abstract of the project</b>	<p>Every day there are growing number of smartphones users. Almost everything can be done using smartphones nowadays. There are a lot of mobile applications which helps people in many things. Our application is also a mobile application which assists user in his medication process and also comes in handy in emergency situations. This application is helpful for the sick people. It reminds them to take their medicine every day in specific time. We are living in a very busy period. Everybody are busy in their own work. It is quite normal to forget to take their medicine. So, to solve this problem, this application was developed. It is a useful application to assist the sick people who take one or multiple medication daily. Missing the medication or not consuming it at a specific time can cause difficulty and medical complication. In that case it is hard for the patient to contact in emergency. This application provides the feature in which user can send an alert to his emergency contact which is stored in the application by clicking an emergency button and the user will also be reminded every time to consume their medication. Due to the COVID restrictions and fear, many people choose not to consult their doctors like the pre-COVID times. Due to that many people could not get their prescription for the required medicine which caused serious problems. This application helps people to consult their doctors and get prescription through a single application. Doctor will upload the typed prescription which then will be converted to digitalized form using Optical Character Recognition (OCR) process. Optical character recognition (OCR) technology is an efficient business process that saves time, cost and other resources by utilizing automated data</p>

	<p>extraction and storage capabilities. (Education, 2022) Then the user can order the medication using the digitalized prescription. After that patient will be able to order their medication through the application.</p> <ul style="list-style-type: none"> <li>Keywords: Medication reminder and tracker, alert to emergency contacts and doctor, prescription panel</li> </ul>
<b>Project deliverables</b>	<ul style="list-style-type: none"> <li>A Medication reminder android application</li> <li>Final Report</li> <li>Academic Poster</li> </ul>
<b>Description of your artefact</b>	<p>The artefact will be a mobile application which will be of three parts as Admin, User and Doctor. The first part will be admin which can access the database and will verify the doctor in the application by viewing doctor's certification.</p> <p>The second part will be the user. User will be able to set the timer for reminder for their medication. User will also be able to add their prescription in digitalized form in the application where it can be used in future. There will also be the medication tracking system where user can view their tracks of their medicine consumption. User will also be able to send alert to their emergency contacts and their doctor by clicking a send alert button.</p> <p>The third part will be a doctor. To be registered as a doctor, user will need required documents. The doctor can view the medication track of the patient and can also send them prescription within the application. There are some other similar applications and the comparison is shown below:</p> <ul style="list-style-type: none"> <li><i>MyTherapy Pill reminder:</i> This is a mobile application which reminds its user to take their medication and track their medication history. It can also tracks weight and blood pressure and keeps track of your inventory.</li> <li><i>Medication reminder and tracker:</i> This is also a mobile application where user will be reminded to take their pills and it tracks your medication history.</li> <li><i>Prescription Maker:</i> This is a mobile application which allows doctor to make a prescription.</li> </ul>

	<p>These are some similar application. They have many features but Medication Reminder system have more. In medication reminder application user will be reminded to take their medicine and the consumption of the medicine will be tracked, user can add emergency contacts to which user can send alert when they are not doing well. This application will also have doctors who can prescribe the medicine through the application and can consult with the patients.</p> <ul style="list-style-type: none"> <li>▪ Problem Statement</li> </ul> <p>The main problem of this application is to atomize the prescription process using OCR. Optical character recognition (OCR) technology is an efficient business process that saves time, cost and other resources by utilizing automated data extraction and storage capabilities (Education, 2022). The system will also have emergency alert button as well as medication tracker.</p> <ul style="list-style-type: none"> <li>▪ Aim</li> </ul> <p>Development of a mobile application to remind patient to consume their medicine and to atomize the prescription process.</p> <ul style="list-style-type: none"> <li>▪ Objective</li> </ul> <ul style="list-style-type: none"> <li>• To create a reminder system which reminds user to consume their medicine.</li> <li>• To make it easy for obtaining the prescription</li> <li>• To notify the emergency contacts if the user is having any difficulties</li> <li>• To keep track of medication consumption</li> </ul> <ul style="list-style-type: none"> <li>▪ List of features that the artefact will include</li> </ul> <ul style="list-style-type: none"> <li>• App will remind user to consume their medicine</li> <li>• App will keep track of their medicine consumption</li> <li>• App will send alert notification to emergency contacts in case of emergency</li> </ul>
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	<ul style="list-style-type: none"> <li>▪ Doctors can prescribe medicine within application in digitalized form</li> <li>▪ Identify added value that the project provides The project will remind users to consume their medicine and get prescription easily</li> <li>▪ Identify the intellectual challenges involved <ul style="list-style-type: none"> <li>• To send notification to the emergency contacts</li> <li>• To digitalize the prescription from a photo</li> </ul> </li> </ul>
<b>What methodology (structured process) will you be following to realise your artefact?</b>	<ul style="list-style-type: none"> <li>▪ Qualitative and quantitative research will be used as a research methodologies. In qualitative research, some questions will be prepared and asked to the individuals and according to their response the application will be upgraded and make it more beneficial to the user. For quantitative research, surveys will be conducted with different questioners with various options as answers. (Streefkerk, 2019)</li> <li>▪ Case study research methods will be used in the project. Questioners will be prepared and asked with different people and interviews will be done. As this type of projects exists, research papers, journals, books will be used as a reference and problems will be solved.</li> <li>▪ Agile is used in this project because it helps to deliver results in easier and faster way. Agile is the process of managing a project by breaking it into several phases (Wrike, 2015). There are many parts in this project and by using agile it will be easier to find best approach to develop the application. The focus of this project is to develop and test the application regularly by which errors can be found and changed easily. If we use agile, we can add new features or change some features and fix errors in the middle of the project.</li> <li>▪ For the testing part, unit testing will be done and made sure that the application is properly functioning. (Fundamentals, 2021)</li> </ul>

	<ul style="list-style-type: none"> <li>▪ System evaluation will be done by analysing the performance of the system and whether the objectives are fulfilled or not.</li> </ul>
<b>How does your project relate to your degree course and build upon the units/knowledge you have studied/acquired</b>	<ul style="list-style-type: none"> <li>▪ Throughout the year there were many courses which prepared us to complete the project for our final year. In Introduction to Software development (CIS020-1) we were taught how to gather the requirements and to create diagrams such as activity and use case to show the flow of our system. In System development and Modern database practices(CIS020-2) we were taught how to create and manage a proper database for a system. In Mobile Application Development (CIS099-2) we were taught how to properly develop a mobile application, frameworks and prototype design techniques. In Social and Professional Project Management(CIS013-3) we were taught how to write our report correctly and professionally. (Bedfordshire, 2022) In Concept and technologies of artificial intelligence(CIS006-2) we were taught to train the data modules.</li> </ul>
<b>Resources-</b>	<ul style="list-style-type: none"> <li>▪ Development Resources</li> </ul> <p><b>Software</b> Flutter 2.10.0 Android Emulator VS code 1.63.2 Visual Paradigm 15.2 My sql 8.0</p> <p><b>Hardware</b> Dell 8 Gb RAM Intel i7 8<sup>th</sup> gen</p> <ul style="list-style-type: none"> <li>▪ Deployment Resources</li> </ul> <p><b>Software</b> Android version 4.0 or higher</p> <p><b>Hardware</b> Smart Phone</p>

	2GB RAM 300MB free storage	
Have you completed & submitted your ethics form?	<input checked="" type="radio"/> YES	NO
<small>If the project is a development of previous work by yourself or others, give details below. Failing to declare such previous work here may be treated as an academic offence</small>		

Supervisor Signature:   
 Course Coordinator Signature 

After the proposal has been signed off by both the supervisor and course coordinator scan the proposal and upload on BREO with signatures. Projects that follow proposals that have not been approved may be cancelled and there will be no compensation for any time lost

## Part 2 – List of relevant resources

Fill in this section after your project proposal has been approved by your supervisor. Use Harvard referencing (see <https://inweb.beds.ac.uk/a-guide-to-referencing>). Modify the list below as appropriate. This list is part of Assignment 1 and will be submitted with the Project Proposal.

### 1. Books

- Amazon.com. (2021). *Optical Character Recognition: An Illustrated Guide to the Frontier (The Springer International Series in Engineering and Computer Science, 502)*: Rice, Stephen V., Nagy, George, Nartker, Thomas A.: 9781461372813: Amazon.com: Books. [online] Available at: <https://www.amazon.com/Optical-Character-Recognition-Illustrated-International/dp/146137281X> [Accessed 10 Mar. 2022].
- Chaudhuri, A., Mandaviya, K., Badelia, P. and Ghosh, S.K. (2016). *Optical Character Recognition Systems for Different Languages with Soft Computing*. 1st ed. 2017 edition ed. [online] Amazon. Springer. Available at: [https://www.amazon.com/Character-Recognition-Different-Languages-Computing-ebook/dp/B01N4H5PMW/ref=sr\\_1\\_1?crid=V82MJVMHSYWM&k](https://www.amazon.com/Character-Recognition-Different-Languages-Computing-ebook/dp/B01N4H5PMW/ref=sr_1_1?crid=V82MJVMHSYWM&k)

[eywords=optical+character+recognition&qid=1646926740&s=books&sprefix=optical+character+recognition%2Cstripbooks-intl-ship%2C303&sr=1-1](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5640083/pdf/bmjopen-2017-017540.pdf?__utma=1646926740&__utms=1&__utmc=1646926740&__utmb=1646926740.1646926740.1646926740.1646926740.1&__utz=1646926740&__utzb=optical+character+recognition%2Cstripbooks-intl-ship%2C303&sr=1-1) [Accessed 10 Mar. 2022].

## 2. Journal Papers

- Tabi, K., Randhawa, A.S., Choi, F., Mithani, Z., Albers, F., Schnieder, M., Nikoo, M., Vigo, D., Jang, K., Demlova, R. and Krausz, M. (2019). Mobile Apps for Medication Management: Review and Analysis. *JMIR mHealth and uHealth*, [online] 7(9), p.e13608. Available at: <https://mhealth.jmir.org/2019/9/e13608/> [Accessed 2 Dec. 2020].
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- ResearchGate. (n.d.). *(PDF) Medication Reminder and Healthcare – An Android Application*. [online] Available at: [https://www.researchgate.net/publication/281379567\\_Medication\\_Reminder\\_and\\_Healthcare\\_-\\_An\\_Android\\_Application](https://www.researchgate.net/publication/281379567_Medication_Reminder_and_Healthcare_-_An_Android_Application).
- Santo, K., Chow, C.K., Thiagalingam, A., Rogers, K., Chalmers, J. and Redfern, J. (2017). MEDication reminder APPs to improve medication adherence in Coronary Heart Disease (MedApp-CHD) Study: a randomised controlled trial protocol. *BMJ Open*, [online] 7(10), p.e017540. Available at:

[https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5640083/pdf/bmjopen-2017-017540.pdf.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5640083/pdf/bmjopen-2017-017540.pdf)

- Gupta, M. and Soeny, K. (2021). Algorithms for rapid digitalization of prescriptions. *Visual Informatics*.
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- Bisiach, J. and Zabkar, M. (n.d.). *180 credits) with a major in Computer Science Spring Semester 2020 Faculty of Natural Sciences*. [online] Science. Available at: <https://www.diva-portal.org/smash/get/diva2:1461885/FULLTEXT01.pdf> [Accessed 11 Mar. 2022].
- Aakash, P. (2016). Optical Character Recognition. *International Journal of scientific research and management*.
- Hassan, E., Tarek, H., Hazem, M., Bahnacy, S., Shaheen, L. and Elashmwai, W.H. (2021). Medical Prescription Recognition using Machine Learning. *2021 IEEE 11th Annual Computing and Communication Workshop and Conference (CCWC)*.

### 3. Web Sites with relevant information

- [www.workfront.com. \(n.d.\). Agile Project Management - A Complete Guide / Workfront. \[online\] Available at: https://www.workfront.com/project-management/methodologies/agile.](https://www.workfront.com/project-management/agile)

- [www.ibm.com, \(n.d.\). What Is Optical Character Recognition \(OCR\)? \[online\] Available at: https://www.ibm.com/cloud/blog/optical-character-recognition.](https://www.ibm.com/cloud/blog/optical-character-recognition)

4. *Relevant software*

Flutter 2.10.0  
VS code 1.63.2  
Visual Paradigm 15.2

5. *Relevant hardware*

Dell PC  
8 Gb RAM  
Intel i7 8<sup>th</sup> gen

6. *Other*

**PACKAGES**  
Flutter 2.10.0  
My sql 8.0

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Available at: <https://breco.beds.ac.uk/>  
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[Accessed 10 03 2022].
- Wrike, 2015. *Project Management Guide*. [Online]  
Available at: <https://www.wrike.com/project-management-guide/faq/what-is-agile-methodology-in-project-management/>  
[Accessed 10 March 2022].

## 10.2. Ethics Form

FACULTY OF CREATIVE ARTS, TECHNOLOGIES AND SCIENCE

Form for Research Ethics Projects (Ethics Form)

Student Name	Salon Poudel
Student Number	1916261
Degree Pathway	BSc. (Hons) Computer Science and Software Engineering
Supervisor name	Sudhir Kumar
Supervisor Signature	<i>Ranoli</i>
Title of project	Easy Prescription & Medication Reminder

**SECTION A      Proposal**

Please summarise in the research proposal (Screening Form) the ethical issues involved and how they will be addressed.

In any proposal involving human participants please provide information on how:

- informed consent will be obtained
- confidentiality will be observed
- the nature of the research and the means of dissemination of the outcomes will be communicated to participants.

**SECTION B Check List**

Please answer the following questions by circling YES or NO as appropriate.

Does the study involve vulnerable participants or those unable to give informed consent (e.g. children, people with learning disabilities, your own students)?	YES NO ✓
Will the study require permission of a gatekeeper for access to participants (e.g. schools, self-help groups, residential homes)?	YES NO ✓
Will it be necessary for participants to be involved without consent (e.g. covert observation in non-public places)?	YES NO ✓
Will the study involve sensitive topics (e.g. obtaining information about sexual activity, substance abuse)?	YES NO ✓
Will blood, tissue samples or any other substances be taken from participants?	YES NO ✓
Will the research involve intrusive interventions (e.g. the administration of drugs, hypnosis, physical exercise)?	YES NO ✓
Will financial or other inducements be offered to participants (except reasonable expenses or small tokens of appreciation)?	YES NO ✓
Will the research investigate any aspect of illegal activity (e.g. drugs, crime, underage alcohol consumption or sexual activity)?	YES NO ✓
Will participants be stressed beyond what is considered normal for them?	YES NO ✓
Will the study involve participants from the NHS (patients or staff) or will data be obtained from NHS premises?	YES NO ✓

If the answer to any of the questions above is "Yes", or if there are any other significant ethical issues, then further ethical consideration is required. Please document carefully how these issues will be addressed.

Signed (student): *Ronan*  
Date: 11/03/2022

Countersigned (Supervisor): *Paula*  
Date: 11/03/2022

### 10.3. Weekly Report

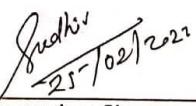
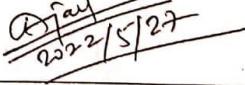
UNIVERSITY OF BEDFORDSHIRE  
DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

FINAL YEAR UG PROJECT: CIS013-3 / CIS017-3

WEEKLY PROGRESS REPORT FORM

STUDENT NAME	Salon Poudel	SUPERVISOR NAME	Sudhir Kumar
PROJECT TITLE	Easy Prescription & medication Reminder		
REPORT NO	1	DATE	2022 / 02 / 13

Summary of Progress (including any problems)	Project base selection Research on related papers consult with supervisor on the topic
Plan for next week	Complete ethics & proposal <del>final</del> draft
Supervisor's Comments	Work - on the comments/Remarks of presentation

	 23/02/2022	 23/02/2022
Student Signature	Supervisor Signature	Course Coordinator Signature

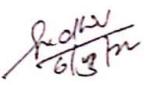
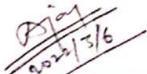
UNIVERSITY OF BEDFORDSHIRE  
DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

FINAL YEAR UG PROJECT: CIS017-3 SEM2

WEEKLY PROGRESS REPORT FORM

STUDENT NAME	Salon Poudel	SUPERVISOR NAME	Sudhir Kumar
PROJECT TITLE	Easy Prescription & Medication Reminder		
REPORT NO	2	DATE	Feb 20 2022

Summary of Progress (Including any problems)	Project title changed & finalized Research paper collected
Plan for next week	To complete draft proposal & presentation
Supervisor's Comments	Asked to submit proposal form

		
Student Signature	Supervisor Signature	Course Coordinator Signature

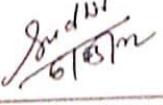
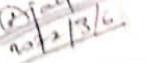
UNIVERSITY OF BEDFORDSHIRE  
DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

FINAL YEAR UG PROJECT: CIS017-3 SEM2

WEEKLY PROGRESS REPORT FORM

STUDENT NAME	Salon Poudel	SUPERVISOR NAME	Sudhir Kumar
PROJECT TITLE	Easy Prescription & Medication Reminder		
REPORT NO	3	DATE	Feb 27 2022

Summary of Progress (including any problems)	Research Papers, Books, Journals collected for literature review
Plan for next week	To present final proposal report & ethics form.
Supervisor's Comments	Asked to submit proposal form & ethics form

	 Jordi 6 Feb 2022	 Raj 27/2/2022
Student Signature	Supervisor Signature	Course Coordinator Signature

UNIVERSITY OF BEDFORDSHIRE  
DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

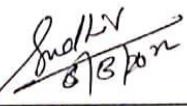
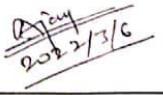
UNIVERSITY OF BEDFORDSHIRE  
DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

FINAL YEAR UG PROJECT: CIS017-3 SEM2

WEEKLY PROGRESS REPORT FORM

STUDENT NAME	Salon Poudel	SUPERVISOR NAME	Siddhar Kumar
PROJECT TITLE	Easy Prescription & Medication Reminder		
REPORT NO	4	DATE	March 6 2022

Summary of Progress (including any problems)	Research Papers collected & <del>improvised</del> the Improved the final proposal report
Plan for next week	To complete the improvised proposal report
Supervisor's Comments	Asked to submit proposal through form

		
Student Signature	Supervisor Signature	Course Coordinator Signature

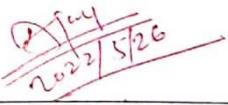
UNIVERSITY OF BEDFORDSHIRE  
DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

FINAL YEAR UG PROJECT: CIS013-3 / CIS017-3

WEEKLY PROGRESS REPORT FORM

STUDENT NAME	Salon Pouder	SUPERVISOR NAME	Sudhir Kumar
PROJECT TITLE	Easy Prescription & Medication Reminders		
REPORT NO	5	DATE	March 13

Summary of Progress (including any problems)	Proposal Report Completed & submitted <del>start</del>
Plan for next week	Starting contextual report.
Supervisor's Comments	Asked to show planning for research work.

		
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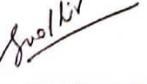
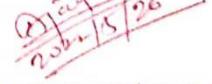
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DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

FINAL YEAR UG PROJECT: CIS013-3 / CIS017-3

WEEKLY PROGRESS REPORT FORM

STUDENT NAME	Salon Poudel	SUPERVISOR NAME	Sudhir Kumar
PROJECT TITLE	Easy Prescription & Medication Reminder		
REPORT NO	6	DATE	March 20

Summary of Progress (including any problems)	Contextual report started & gathered journals & research papers on related topic.
Plan for next week	Preparing draft questionnaires for surveys. Starting literature review
Supervisor's Comments	checked the work & provided feedback.

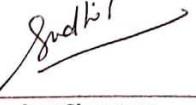
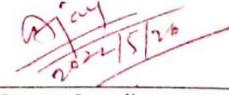
		
Student Signature	Supervisor Signature	Course Coordinator Signature

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 DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY  
 FINAL YEAR UG PROJECT: CIS013-3 / CIS017-3

WEEKLY PROGRESS REPORT FORM

STUDENT NAME	Salon Poudel	SUPERVISOR NAME	Sudhir Kumar
PROJECT TITLE	Easy Prescription & Medication Reminder		
REPORT NO	7	DATE	April 3

Summary of Progress (including any problems)	Questionnaires prepared & finalized Literature review started Introduction Completed.
Plan for next week	Completion of literature review Completion of project plan Completion of report (Draft) for presentation
Supervisor's Comments	checked the work & provided feedback.

		
Student Signature	Supervisor Signature	Course Coordinator Signature

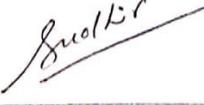
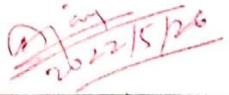
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DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

FINAL YEAR UG PROJECT: CIS013-3 / CIS017-3

WEEKLY PROGRESS REPORT FORM

STUDENT NAME	Salon Poudel	SUPERVISOR NAME	Sudhir Kumar
PROJECT TITLE	Easy Prescription & Medication Reminder App		
REPORT NO	8	DATE	April 24

Summary of Progress (including any problems)	Draft report completed & presentation completed.
Plan for next week	Complete the contextual report by updating from the reviews from presentation
Supervisor's Comments	Checked the work & provided feedback.

		
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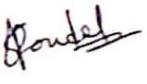
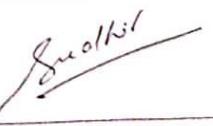
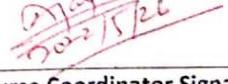
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DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

FINAL YEAR UG PROJECT: CIS013-3 / CIS017-3

WEEKLY PROGRESS REPORT FORM

STUDENT NAME	Salon Poudel	SUPERVISOR NAME	Sadhir Kumar
PROJECT TITLE	Easy Prescription & Medication Reminders		
REPORT NO	10	DATE	May 20

Summary of Progress (including any problems)	Updated the contextual report
Plan for next week	Submission of contextual report
Supervisor's Comments	Checked the work & provided feedback. Asked to do code check before submission.

		
Student Signature	Supervisor Signature	Course Coordinator Signature

## 10.4. Survey Questionnaires

# Easy Prescription and Medication Reminder Application

I am Salon Poudel, currently studying Computer Science and Software Engineering in University of Bedfordshire. I am currently working on the research part of the topic Easy Prescription and Medication Reminder Application. It is a mobile based application will assists users in different ways. It helps in reminding people to take their pills in the time which is set by the user. This application will also helps user to consult with their doctors easily as there is a chat box through which user and their doctor can discuss their problem. This application will also helps in prescription process. Doctor will convert the hand-written prescription into digitalized form by uploading in the application so that user can use it to order medicines.

With the submission of this form, the data will be used to develop the application or to modify the application according to the needs of the user. All data provided will be in secured form and in case of problems in filling the form, then respondents are requested to contact via  
[salon.poudel@patancollege.edu.np](mailto:salon.poudel@patancollege.edu.np)

Gender \*

- Male
- Female
- Other...

Are you responding as a doctor or a patient? \*

- Doctor
- Patient

Which age group do you belong? \*

- below 18
- 18-25
- 25-35
- 35-50
- above 50

Do you or your family have any illness? \*

- Yes
- No
- Maybe

Do you or your family have to consume medicine daily? \*

- Yes
- No
- Maybe

How do you buy your medicine? \*

- Online
- Local Vendors

If online, what type of prescription do you send?

- Hand-written
- Photograph of prescription
- Digitalized Prescription

How many medicine do you or your family have to consume in a day? \*

- 1
- 2
- 3
- 3+

How often you forget about taking your medicine?

- Never
- Occasionally
- Sometimes
- Often

How often do you consult your doctor? \*

- Regularly
- Once every month
- Occasionally
- Only when ill

How do you get your prescription? \*

- Hand-written
- Photograph
- Digitalized

How do you feel about getting prescription online from your doctor? \*

- Moving forward with technology
- Prefer handwritten prescription
- Other...

Would you use an application which will remind you to take your medication, helps you consult \* with your doctor and can provide you digitalized form of prescription from your doctor?

- Yes
- No
- Maybe

Any extra features?

Long-answer text