Mini Project report on

# Digital Diary

By

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Under the guidance of

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2021-22

# CERTIFICATE OF APPROVAL

This is to certify that the following students

**KRISHNA CHHABRIA [2020510013]**

Have satisfactorily carried out work on the project entitled
**"Digital Diary"**

Towards the fulfillment of the summer project, as laid down by University of Mumbai during the year 2021-22.

_____
Project Guide
(Dr. Aarti Karande)

# PROJECT APPROVAL CERTIFICATE

This is to certify that the following students

**KRISHNA CHHABRIA [2020510013]**

Have successfully completed the Project report on **"Digital Diary"**, which is found to be satisfactory and is approved

At

SARDAR PATEL INSTITUTE OF TECHNOLOGY,
ANDHERI (W), MUMBAI.

| | |
|---|---|
| _____ | _____ |
| INTERNAL EXAMINER | EXTERNAL EXAMINER |
| _____ | _____ |
| Head of Department | Principal |
| (Dr. Pooja Raundale) | (Dr. B.N Chaudhari) |

# Chapter 1

# INTRODUCTION

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## 1.1 Problem Statement

To design an application that will help users label images, detect objects & extract text from images. The application will also provide a method of sorting images according to the labels identified on the device as well as on the cloud.

## 1.2 Objective and Scope

### 1.2.1 Objectives:

1. To develop an application that will provide a suite of services for analyzing images on the go.

2. To organize, backup and maintain media (photos & videos) if the user so desires.

### 1.2.2 Scope:

1. Any individual can use this application across the country.

2. The user must register / login to the application in order to start using it.

3. The applications main goal is to provide an interface for analyzing images and performing operations on them such as text recognition, object detection, & image labeling.

## 1.3 System Requirements:

### 1.3.1 Hardware Requirements:

- At least 2GB of RAM
- At least 1 Ghz processor

### 1.3.2 Software Requirements:

- Device running Android version 6.0 or above.
- An active internet connection.

# Chapter 2

## LITERATURE SURVEY

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Media management on our Android devices has gotten extremely tedious. Most of the time we can't find the picture or video we are looking for in the ever increasing pile of multimedia thanks to the ease of sharing material through social media.

Our app combines various technologies to create a unified solution providing many more features such as sharing, album creation, searching for those exact moments, adding notes to albums to personalize viewing and storage experience.

**A Secure Mobile Cloud Photo Storage System**

This paper proposes a system for secure storage of photos. AWS buckets (using the S3 service) are used to store the photos which are encrypted using AES (Advanced Encryption Standard). Gesture based authentication is used allows the device to access the appropriate
Amazon S3 buckets and uses a public private key pair.

Also, to protect data locally, the user name, password, and various account bucket
keys are encrypted locally on the device on which they were created using a 512-bit Advanced Encryption Standard (AES) key. AWS employs SSL (Secure Socket Layer) to encrypt data while it is in transit.

**Pixelsior: Photo Management as a Platform Service for Mobile Apps**

This research paper suggests developing a photo management service for mobile apps by introducing features such as:

- Capture & Storage: photo apps should capture and store images on the local storage as well as on the cloud as well as capture a set of metadata (such as location, date, etc.), and embedding within the photo.

- Retrieval: for easy retrieval of images, they must be organized into albums. Some sophisticated apps also use computer vision to organize photos and sort the photos by various parameters such as
  place, people etc.

- Image editing: Beyond storage and retrieval, many popular photo apps such as Instagram and Snapchat are built around image editing functionality. Edit operations vary in complexity from resizing to image filters, and as complex as manual retouching at a pixel level granularity.

- Mobile Data Management: is also important as the user will be on the go and the amount of bandwidth available can be limited which is why the images and videos need to be compressed before uploading to the cloud. Adding the option of backing them up on Wi-Fi only can save a lot of data and make it available to the user for other important purposes.

**PhotoSynthesis – Photo Sharing Application (Android)**

This paper proposes a method of automating the sharing of media with friends and family. The application scans the gallery of the user and groups the pictures according to the time, date, and location, after that application finds if there is a match between the location of the user and his Facebook friends and determines whether the friends were present at the same location where the photos were clicked. Using this information it notifies and allows the user to send multiple photos to selected friends by the click of a button.

**Development Of An Android App For Text Detection**

Text recognition is the process of extracting text data from given images which is also considered as Optical Character Recognition (OCR). This paper proposes a method of text detection from images. First, the image is converted to a Gray Scale, then a process called Binarization is used (which basically means removing the background of the image) which leaves behind only the letters of the stroke, Segmentation (separating characters from an image), Text Recognition (for this step Google's open source OCR i.e. Tesseract http://code.google.com/p/tesseract-ocr/) is used.

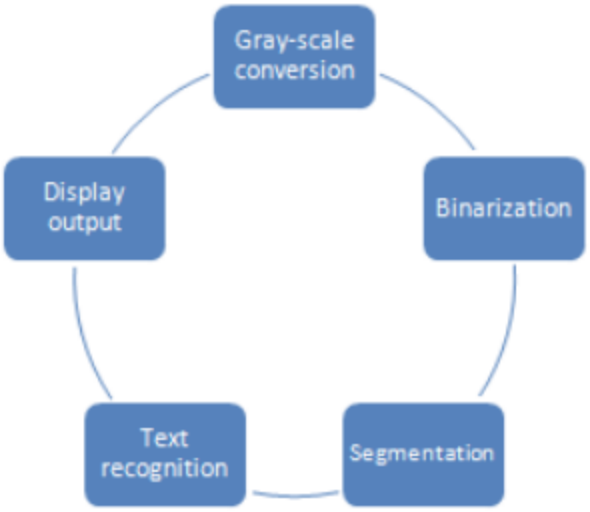


Figure 1: Block Diagram of the Proposed Method

Pseudo Code for Binarization:
1 Take input image for the noise removal process
2 Examine the intensity of a pixel inside the image.
3 IF intensity of a pixel is less than threshold value, Substitute the intensity with 0
Else
Substitute the intensity with 1
End IF
4 Repeat the process for every pixel in the image.

**A Study on Real-Time Database Technology and Its Applications**

This paper studies the various real-time database technologies that are out there (such as Firebase, MongoDB, Cassandra) and their evolution over the past few years. The most popular real-time database technologies and how they store data is given below:

- Firebase: uses a key-value based storage method. Firebase also supports document based storage and this storage is listed as Firestore.

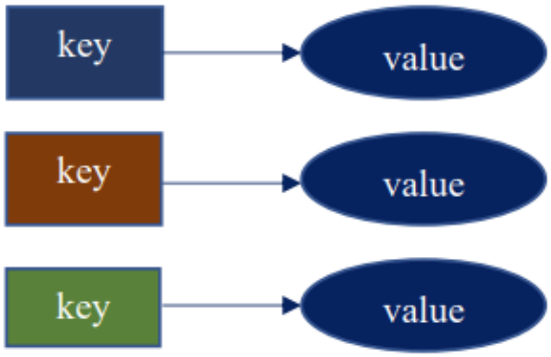


*Figure 14: Key-value structure*

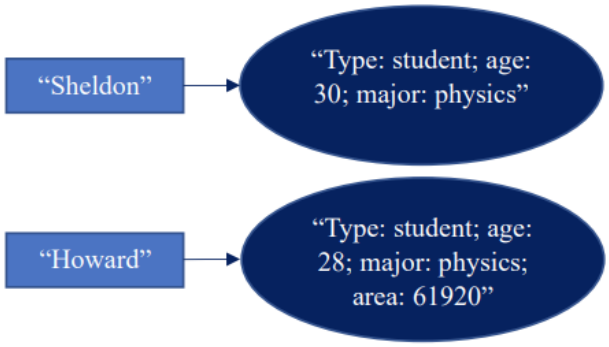


*Figure 15: Key-value example*

- MongoDB: MongoDB is considered to be the most popular document based real-time database in the market. It is open source and stores data as BSON(Binary JSON). It is document dependent and there is no schema in the database at all.

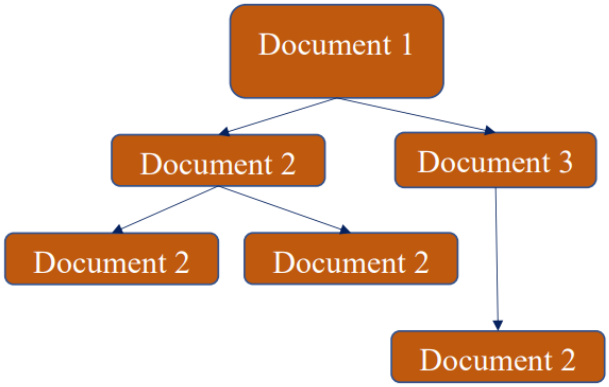


*Figure 16: Document based store*

```
Id: 001, “name”: “sheldon”, “occupation”: “physicist”
Id: 231, “name”: “howard”, “occupation”: “physicist”, “age”
Id: 3443, “name”: “raj”, “occupation”: “physicist”
```

*Figure 17: MongoDB example*

# Chapter 3

## Software Requirement Specification (SRS) and Design

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## 3.1 Introduction

• A Software Requirement Specification (SRS) is a comprehensive description of the intended purpose and environment for software under development. The SRS fully describes what the software will do and how it will be expected to perform.

### 3.1.1 Purpose

• The purpose of this SRS Document is to present a description of the project. This SRS outlines the process followed to gather the requirements for the project. This document will also describe how the requirement statements gathered from the stakeholders make their way into features of the system.

• This document will, in addition, explain the scope, interfaces, and features as well as graphically describe the processes, functions and phases of the Software Development Life-cycle.

## 3.2 Overall Description

The user will have to login/register into the application first in order to access the various features. This application provides an interface for performing object detection, labeling & text extraction from images.

## 3.3 Specific Requirements

### 3.3.1 Functional Requirements

- The application should validate each and every user.
- At the time of login, the database must check if a user already has an account.
- The user can only login if already registered.
- Users should be able to edit & view their profile information.

### 3.3.2 Non-functional Requirements

• Users should be able to understand & navigate the interface clearly.

• The information provided by the various modules (object detection, labeling & text extraction) must be extremely accurate.

• Users must be able to search for any images they may have created a record for after labeling their image.

# Chapter 4

## Project Analysis and Design

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## 4.1 Methodologies Accepted:

Since the system being developed is a platform which performs various operations on images, the appropriate model for this would be RAD (Rapid Application Development).

The RAD model will be the most appropriate since the system is developed within a span of just 2 months and the team size being limited to just 2 (Project Manager & Developer). The RAD model works best for small team sizes.

The RAD model produces small increments known as Prototypes which can be made available to our customers for testing in real time and get useful feedback for improvements.

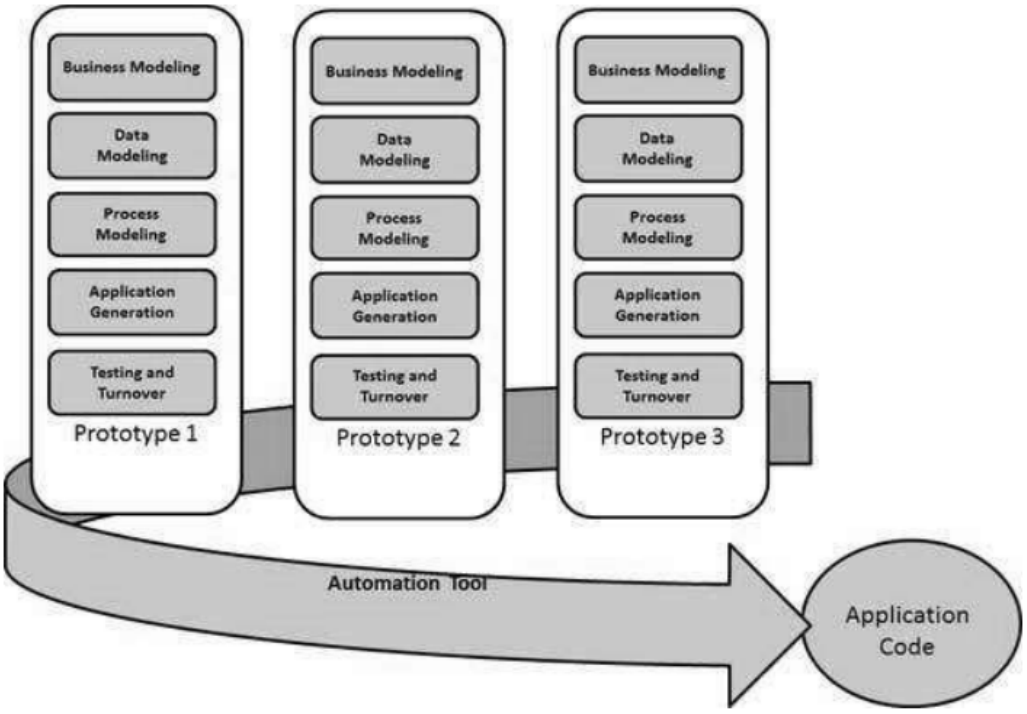
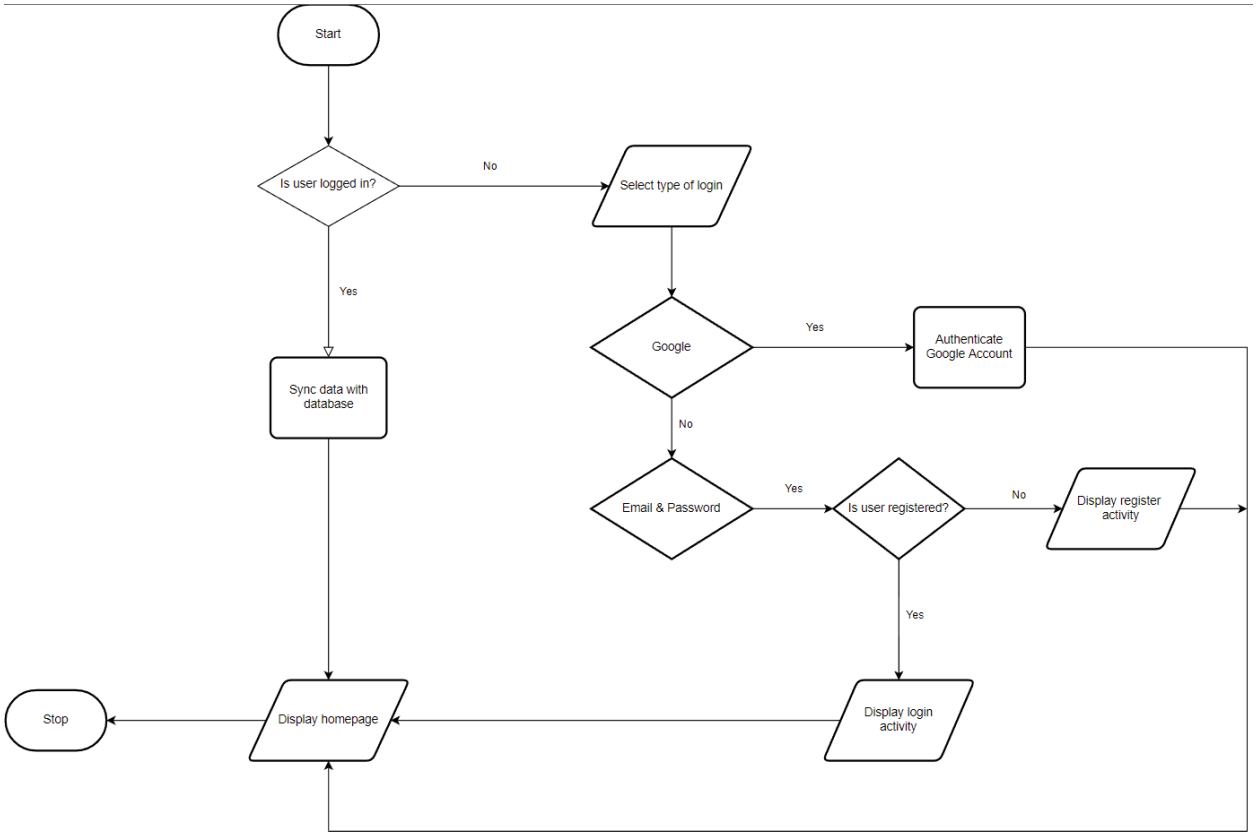
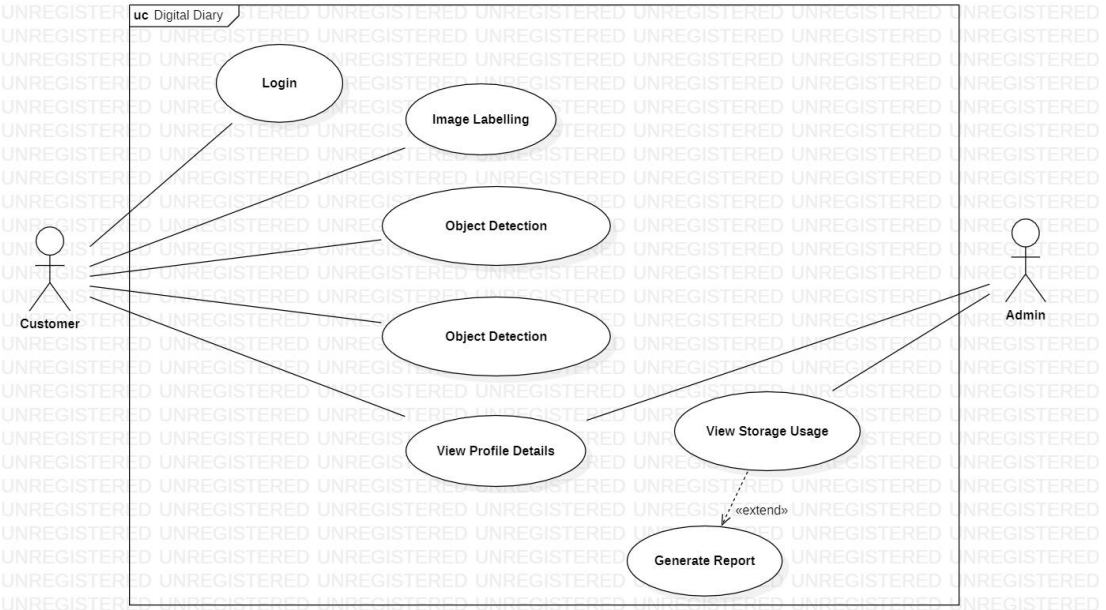



**Fig 3.1 RAD Model**

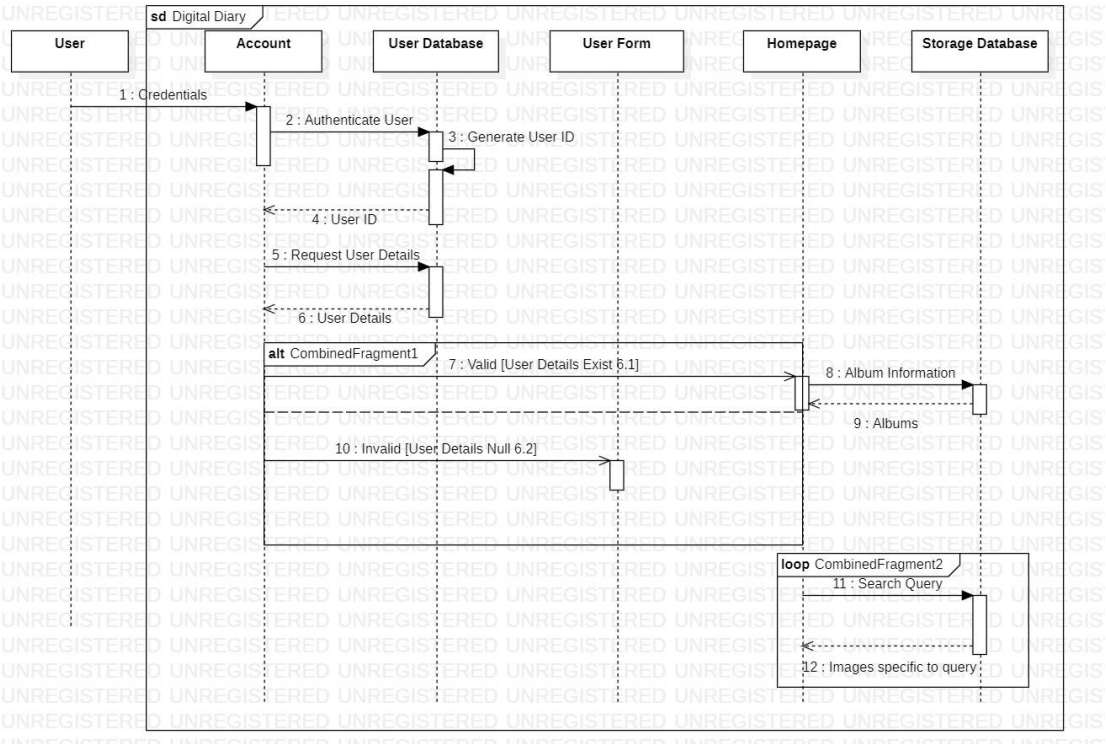
**Flowchart:**


Start
Is user logged in?
No
Select type of login
Yes
Google
Yes
Authenticate Google Account
Sync data with database
No
Email & Password
Yes
Is user registered?
No
Display register activity
Yes
Stop
Display homepage
Display login activity

## Use Case Diagram:




## Sequence Diagram:



# Chapter 5

## Project Implementation and Testing

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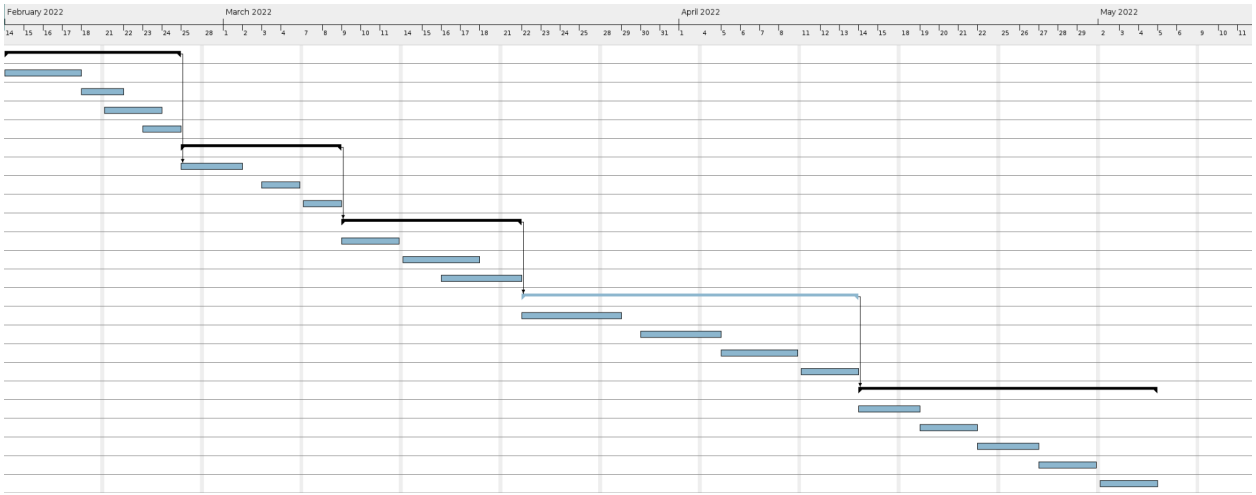
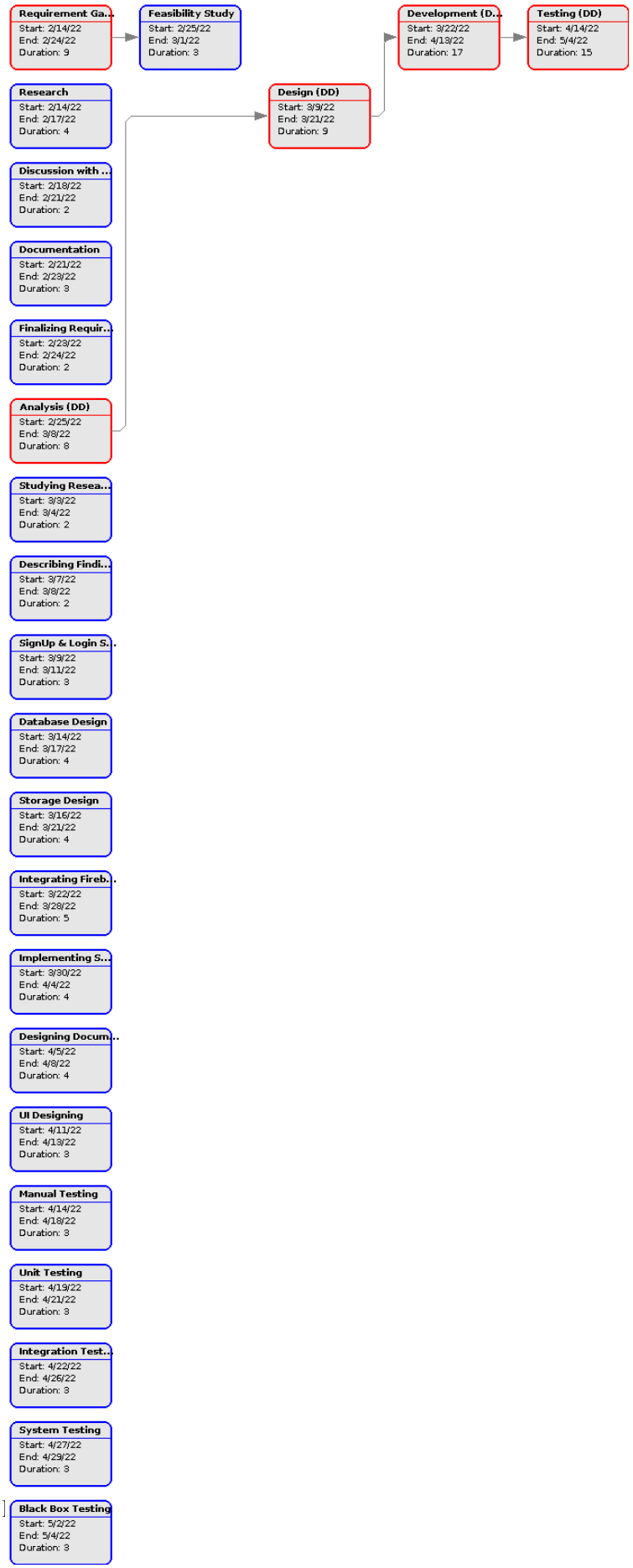
## 5.1 Work Breakdown Structure

| Name | Begin date | End date | Duration | ID | Predecessors | Resources |
|---|---|---|---|---|---|---|
| Requirement Gathering (DD) | 2/14/22 | 2/24/22 | 9 | 0 | | Krishna,Aarti Ma'am |
| Research | 2/14/22 | 2/17/22 | 4 | 1 | | |
| Discussion with mentor | 2/18/22 | 2/21/22 | 2 | 2 | | |
| Documentation | 2/21/22 | 2/23/22 | 3 | 3 | | |
| Finalizing Requirements | 2/23/22 | 2/24/22 | 2 | 4 | | |
| Analysis (DD) | 2/25/22 | 3/8/22 | 8 | 5 | | Krishna,Aarti Ma'am |
| Feasibility Study | 2/25/22 | 3/1/22 | 3 | 6 | 0 | |
| Studying Research Papers | 3/3/22 | 3/4/22 | 2 | 7 | | |
| Describing Findings of Research... | 3/7/22 | 3/8/22 | 2 | 8 | | |
| Design (DD) | 3/9/22 | 3/21/22 | 9 | 9 | 5 | Krishna |
| SignUp & Login Screens | 3/9/22 | 3/11/22 | 3 | 10 | | |
| Database Design | 3/14/22 | 3/17/22 | 4 | 11 | | |
| Storage Design | 3/16/22 | 3/21/22 | 4 | 12 | | |
| Development (DD) | 3/22/22 | 4/13/22 | 17 | 13 | 9 | Krishna |
| Integrating Firebase APIs | 3/22/22 | 3/28/22 | 5 | 14 | | |
| Implementing Search Functions | 3/30/22 | 4/4/22 | 4 | 15 | | |
| Designing Document Vault | 4/5/22 | 4/8/22 | 4 | 16 | | |
| UI Designing | 4/11/22 | 4/13/22 | 3 | 18 | | |
| Testing (DD) | 4/14/22 | 5/4/22 | 15 | 19 | 13 | Krishna |
| Manual Testing | 4/14/22 | 4/18/22 | 3 | 20 | | |
| Unit Testing | 4/19/22 | 4/21/22 | 3 | 21 | | |
| Integration Testing | 4/22/22 | 4/26/22 | 3 | 22 | | |
| System Testing | 4/27/22 | 4/29/22 | 3 | 23 | | |
| Black Box Testing | 5/2/22 | 5/4/22 | 3 | 24 | | |

## 5.2 Gantt Chart




## 5.3 Pert Chart


Requirement Ga...
Start: 2/14/22
End: 2/24/22
Duration: 9
Feasibility Study
Start: 2/25/22
End: 3/1/22
Duration: 3
Development (D...
Start: 3/22/22
End: 4/13/22
Duration: 17
Testing (DD)
Start: 4/14/22
End: 5/4/22
Duration: 15
Research
Start: 2/14/22
End: 2/17/22
Duration: 4
Design (DD)
Start: 3/9/22
End: 3/21/22
Duration: 9
Discussion with ...
Start: 2/18/22
End: 2/21/22
Duration: 2
Documentation
Start: 2/21/22
End: 2/23/22
Duration: 3
Finalizing Requir...
Start: 2/23/22
End: 2/24/22
Duration: 2
Analysis (DD)
Start: 2/25/22
End: 3/8/22
Duration: 8
Studying Resea...
Start: 3/3/22
End: 3/4/22
Duration: 2
Describing Findi...
Start: 3/7/22
End: 3/8/22
Duration: 2
SignUp & Login S...
Start: 3/9/22
End: 3/11/22
Duration: 3
Database Design
Start: 3/14/22
End: 3/17/22
Duration: 4
Storage Design
Start: 3/16/22
End: 3/21/22
Duration: 4
Integrating Fireb...
Start: 3/22/22
End: 3/28/22
Duration: 5
Implementing S...
Start: 3/30/22
End: 4/4/22
Duration: 4
Designing Docum...
Start: 4/5/22
End: 4/8/22
Duration: 4
UI Designing
Start: 4/11/22
End: 4/13/22
Duration: 3
Manual Testing
Start: 4/14/22
End: 4/18/22
Duration: 3
Unit Testing
Start: 4/19/22
End: 4/21/22
Duration: 3
Integration Test...
Start: 4/22/22
End: 4/26/22
Duration: 3
System Testing
Start: 4/27/22
End: 4/29/22
Duration: 3
Black Box Testing
Start: 5/2/22
End: 5/4/22
Duration: 3

## 5.4 Code with reference to design

### Activity_login.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".account.OTPLogin">

    <ImageView
        android:id="@+id/icon"
        android:layout_width="200dp"
        android:layout_height="200dp"
        android:layout_marginStart="16dp"
        android:layout_marginTop="32dp"
        android:layout_marginEnd="16dp"
        android:src="@drawable/giphy"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        android:layout_marginStart="16dp"
        android:layout_marginTop="32dp"
        android:layout_marginEnd="16dp"
        android:id="@+id/linear_layout">

        <com.google.android.material.textfield.TextInputLayout
            android:layout_width="0dp"
            android:layout_height="wrap_content"

style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox.Dense"
            android:layout_weight="3"
            android:enabled="false"
            android:layout_marginEnd="8dp">
```

```
            <com.google.android.material.textfield.TextInputEditText
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:text="+91"
                android:textColorHint="@android:color/white" />

        </com.google.android.material.textfield.TextInputLayout>

        <com.google.android.material.textfield.TextInputLayout
            android:layout_width="0dp"
            android:layout_height="wrap_content"

style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox.Dense"
            android:layout_weight="10"
            android:layout_marginStart="8dp">

            <com.google.android.material.textfield.TextInputEditText
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:hint="@string/enter_number"
                android:textColorHint="@android:color/white"
                android:id="@+id/phone_number"
                android:inputType="phone"/>

        </com.google.android.material.textfield.TextInputLayout>

    </LinearLayout>

    <TextView
        android:id="@+id/email_textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginTop="32dp"
        android:layout_marginEnd="16dp"
        android:gravity="center"
        android:text="Use Email Instead>"
        android:textSize="16sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/linear_layout"
        android:textColor="#0E3EDA"/>

    <Button
        android:id="@+id/login"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginEnd="16dp"
```

```
        android:layout_marginBottom="32dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        android:text="Continue"
        android:background="@drawable/rounded_corner_button"
        android:textColor="@color/white"/>

</androidx.constraintlayout.widget.ConstraintLayout>
```

**Activity_sign_up.xml:**

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".account.SignUp">

    <ImageView
        android:id="@+id/icon"
        android:layout_width="200dp"
        android:layout_height="200dp"
        android:layout_marginStart="16dp"
        android:layout_marginTop="32dp"
        android:layout_marginEnd="16dp"
        android:src="@drawable/giphy"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginTop="32dp"
        android:layout_marginEnd="16dp"
        android:orientation="vertical"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/icon"
        android:id="@+id/linear_layout">

        <com.google.android.material.textfield.TextInputLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
```

```
style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox.Dense"
            android:layout_weight="3"
            android:layout_marginBottom="8dp">

            <com.google.android.material.textfield.TextInputEditText
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:hint="Email"
                android:textColorHint="@android:color/white"
                android:id="@+id/email"
                android:inputType="textEmailAddress"/>

        </com.google.android.material.textfield.TextInputLayout>

        <com.google.android.material.textfield.TextInputLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"

style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox.Dense"
            android:layout_weight="3"
            android:layout_marginBottom="8dp">

            <com.google.android.material.textfield.TextInputEditText
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:hint="Password"
                android:textColorHint="@android:color/white"
                android:id="@+id/password"
                android:inputType="textPassword"/>

        </com.google.android.material.textfield.TextInputLayout>

        <com.google.android.material.textfield.TextInputLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"

style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox.Dense"
            android:layout_weight="3">

            <com.google.android.material.textfield.TextInputEditText
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:hint="Confirm Password"
                android:textColorHint="@android:color/white"
                android:id="@+id/confirm_password"
                android:inputType="textPassword"/>

        </com.google.android.material.textfield.TextInputLayout>
```

```
    </LinearLayout>

    <TextView
        android:id="@+id/login_textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginTop="32dp"
        android:layout_marginEnd="16dp"
        android:gravity="center"
        android:text="Already have an account? Login Here>"
        android:textSize="16sp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/linear_layout"
        android:textColor="#0E3EDA"/>

    <Button
        android:id="@+id/sign_up"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginEnd="16dp"
        android:layout_marginBottom="32dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        android:text="Continue"
        android:background="@drawable/rounded_corner_button"
        android:textColor="@color/white"/>

</androidx.constraintlayout.widget.ConstraintLayout>
```

**Fragment_label.xml:**

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/pull_to_refresh_layout"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".ui.ui.label.LabelFragment">

    <ScrollView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:animateLayoutChanges="true"
        android:id="@+id/scrollView">

        <androidx.constraintlayout.widget.ConstraintLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:nestedScrollingEnabled="true">

            <LinearLayout
                android:id="@+id/choose_photo_layout"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_marginTop="32dp"
                android:layout_marginBottom="32dp"
                android:orientation="vertical"
                app:layout_constraintEnd_toEndOf="parent"
                app:layout_constraintStart_toStartOf="parent"
                app:layout_constraintTop_toTopOf="parent">

                <TextView
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:gravity="center_horizontal"
                    android:text="Select your image to label!"
                    android:textColor="@android:color/black"
                    android:textSize="20sp" />

                <ImageView
                    android:id="@+id/selected_imageView"
                    android:layout_width="match_parent"
                    android:layout_height="250dp"
                    android:layout_margin="16dp"
                    android:src="@drawable/avatar" />
```

```
        <LinearLayout
            android:id="@+id/select_image_layout"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginStart="16dp"
            android:layout_marginTop="32dp"
            android:layout_marginEnd="16dp"
            android:orientation="horizontal">

            <Button
                android:id="@+id/take_image"
                android:layout_width="0dp"
                android:layout_height="wrap_content"
                android:layout_marginStart="8dp"
                android:layout_weight="1"
                android:text="Take Image" />

            <Button
                android:id="@+id/choose_image"
                android:layout_width="0dp"
                android:layout_height="wrap_content"
                android:layout_marginStart="16dp"
                android:layout_marginEnd="16dp"
                android:text="Select Image"
                android:layout_weight="1"/>

        </LinearLayout>

    </LinearLayout>

    <LinearLayout
        android:id="@+id/labels_layout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="32dp"
        android:layout_marginBottom="32dp"
        android:orientation="vertical"
        android:visibility="gone"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/choose_photo_layout">

        <TextView
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginStart="16dp"
            android:layout_marginEnd="16dp"
            android:text="Labels Identified: "
            android:textColor="@android:color/black"
```

```
        android:textSize="20sp" />

    <TextView
        android:id="@+id/labels_textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginTop="16dp"
        android:layout_marginEnd="16dp"
        android:text="Labels Identified: "
        android:textColor="@android:color/black"
        android:textSize="16sp" />

    <EditText
        android:id="@+id/label_entered"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginTop="16dp"
        android:layout_marginEnd="16dp"
        android:hint="Enter your label (can also be custom)"
        android:inputType="textCapWords" />

    <LinearLayout
        android:id="@+id/save_layout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="16dp"
        android:layout_marginTop="32dp"
        android:layout_marginEnd="16dp"
        android:orientation="horizontal">

        <Button
            android:id="@+id/save_to_device"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_marginEnd="8dp"
            android:layout_weight="1"
            android:text="Save to Device" />

        <Button
            android:id="@+id/save_to_cloud"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_marginStart="8dp"
            android:layout_weight="1"
            android:text="Save to Cloud" />

    </LinearLayout>
```

```
                <TextView
                    android:id="@+id/save_to_device_warning"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:layout_marginStart="16dp"
                    android:layout_marginTop="16dp"
                    android:layout_marginEnd="16dp"
                    android:text="(Note: saving to device will not help you
recover the data if you delete the app!)"
                    android:textColor="#D0342C" />


<com.google.android.material.floatingactionbutton.ExtendedFloatingActionButton
                    android:id="@+id/speech_fab"
                    android:layout_width="wrap_content"
                    android:layout_height="wrap_content"
                    android:layout_marginTop="8dp"
                    android:layout_marginEnd="32dp"
                    android:text="Speak out!"
                    app:icon="@drawable/ic_baseline_speaker_phone_24"
                    app:iconTint="@android:color/white"
                    android:layout_gravity="end"
                    android:textColor="@android:color/white"
                    android:backgroundTint="@color/azure_blue"/>

            </LinearLayout>

        </androidx.constraintlayout.widget.ConstraintLayout>

    </ScrollView>
</LinearLayout>
```

**Fragment_profile.xml:**

```
<?xml version="1.0" encoding="utf-8"?>
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".ui.ui.profile.ProfileFragment">

    <androidx.constraintlayout.widget.ConstraintLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent">

        <TextView
            android:id="@+id/welcome_textView"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginStart="16dp"
            android:layout_marginTop="32dp"
            android:layout_marginEnd="16dp"
            android:gravity="center_horizontal"
            android:text="Hey, Krishna"
            android:textSize="24sp"
            android:textStyle="italic"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toTopOf="parent" />

        <TextView
            android:id="@+id/profile_page_info"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="8dp"
            android:gravity="center"
            android:text="You may edit your profile details here!"
            android:textSize="18sp"
            android:textStyle="italic"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toBottomOf="@id/welcome_textView" />

        <androidx.cardview.widget.CardView
            android:id="@+id/name_cardView"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginStart="24dp"
            android:layout_marginTop="32dp"
```

```
            android:layout_marginEnd="24dp"
            app:cardBackgroundColor="@color/azure_blue"
            app:cardCornerRadius="5dp"
            app:cardElevation="5dp"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toBottomOf="@id/profile_page_info">

            <LinearLayout
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:orientation="vertical"
                android:padding="8dp">

                <TextView
                    android:id="@+id/name_textView"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:layout_marginStart="5dp"
                    android:layout_marginEnd="24dp"
                    android:text="Name"
                    android:textColor="@android:color/white"
                    android:textSize="18sp"
                    android:textStyle="bold" />

                <EditText
                    android:id="@+id/name_editText"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:layout_marginTop="8dp"
                    android:layout_marginEnd="24dp"
                    android:background="@drawable/profile_edittext"
                    android:padding="8dp"
                    android:text="Krishna"
                    android:textColor="@android:color/white" />

            </LinearLayout>

        </androidx.cardview.widget.CardView>

        <LinearLayout
            android:id="@+id/backup_layout"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toBottomOf="@id/name_cardView">

            <TextView
```

```
            android:id="@+id/backup_textView"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_marginStart="24dp"
            android:layout_marginTop="24dp"
            android:layout_weight="1"
            android:text="Backup:"
            android:textSize="18sp"
            android:textStyle="bold" />

        <Spinner
            android:id="@+id/backup_spinner"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_marginTop="24dp"
            android:layout_weight="1" />
    </LinearLayout>

    <LinearLayout
        android:id="@+id/image_quality_layout"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/backup_layout">

        <TextView
            android:id="@+id/image_quality_textView"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_marginStart="24dp"
            android:layout_marginTop="24dp"
            android:layout_weight="1"
            android:text="Image Quality:"
            android:textSize="18sp"
            android:textStyle="bold" />

        <Spinner
            android:id="@+id/image_quality_spinner"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_marginTop="24dp"
            android:layout_weight="1" />

    </LinearLayout>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
```

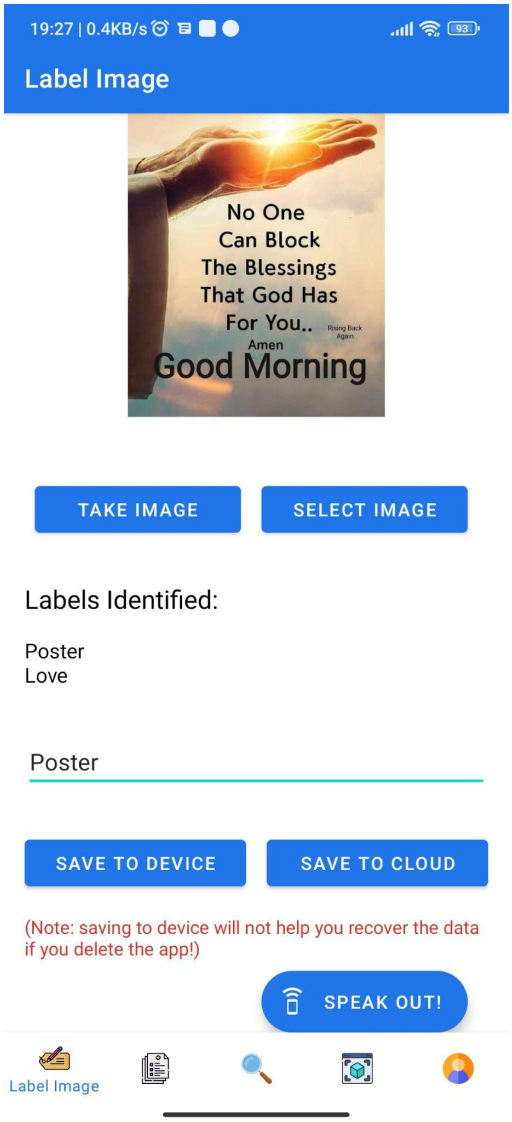
```
        android:orientation="horizontal"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/image_quality_layout"
        android:id="@+id/images_labeled_layout"
        android:layout_marginTop="24dp">

        <TextView
            android:id="@+id/number_of_images_labeled"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_marginStart="24dp"
            android:layout_weight="1"
            android:text="Images Labeled:"
            android:textSize="18sp"
            android:textStyle="bold" />

        <TextView
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:text="0"
            android:layout_weight="1"
            android:gravity="end"
            android:layout_marginEnd="24dp"
            android:id="@+id/images_labeled_textView"/>

    </LinearLayout>

    <androidx.cardview.widget.CardView
        android:id="@+id/document_vault_cardView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginStart="20dp"
        android:layout_marginTop="24dp"
        android:layout_marginEnd="24dp"
        app:cardCornerRadius="5dp"
        app:cardElevation="5dp"
        app:layout_constraintEnd_toStartOf="parent"
        app:layout_constraintStart_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@id/images_labeled_layout">

        <TextView
            android:id="@+id/vault_textView"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginStart="5dp"
            android:layout_marginEnd="8dp"
            android:text="Create your document vault"
            android:textSize="18sp"
```

```
                android:textStyle="bold"
                android:padding="8dp" />

            <LinearLayout
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:orientation="vertical"
                android:padding="8dp"
                android:visibility="gone"
                android:id="@+id/create_vault_linear_layout">

                <Button
                    android:id="@+id/document_vault_button"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:layout_marginStart="16dp"
                    android:layout_marginTop="48dp"
                    android:layout_marginEnd="16dp"
                    android:background="@drawable/profile_edittext"
                    android:text="Create Vault!"
                    app:layout_constraintEnd_toEndOf="parent"
                    app:layout_constraintStart_toStartOf="parent"

app:layout_constraintTop_toBottomOf="@id/document_vault_cardView" />

            </LinearLayout>

        </androidx.cardview.widget.CardView>

        <Button
            android:id="@+id/access_vault_button"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginStart="16dp"
            android:layout_marginTop="32dp"
            android:layout_marginEnd="16dp"
            android:background="@drawable/profile_edittext"
            android:text="Access Document Vault"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toBottomOf="@id/document_vault_cardView"
            android:visibility="gone"/>

        <Button
            android:id="@+id/update_button"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginStart="16dp"
            android:layout_marginTop="32dp"
```

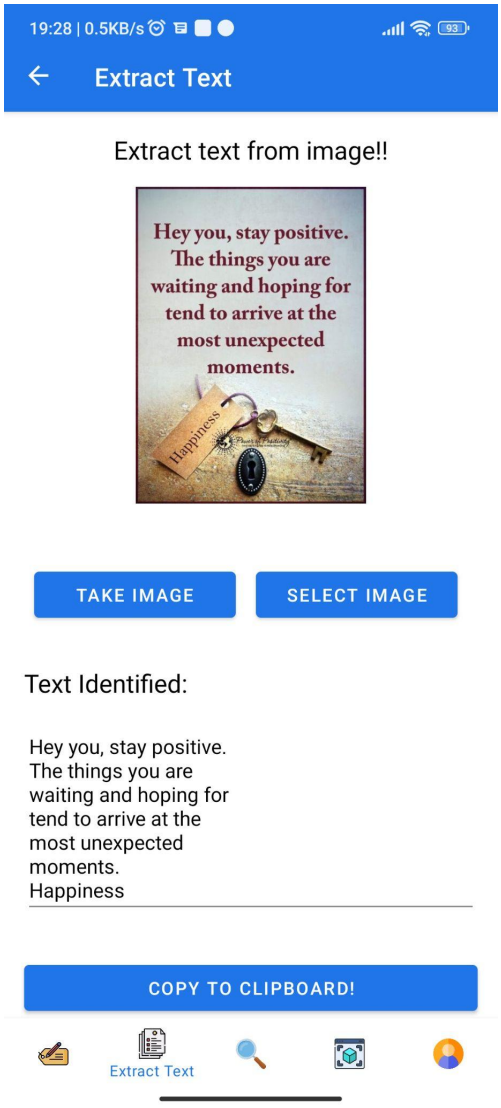
```
            android:layout_marginEnd="16dp"
            android:background="@drawable/profile_edittext"
            android:text="Update!"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toBottomOf="@id/access_vault_button" />

    </androidx.constraintlayout.widget.ConstraintLayout>
</ScrollView>
```

## 5.5 Snapshots of UI:

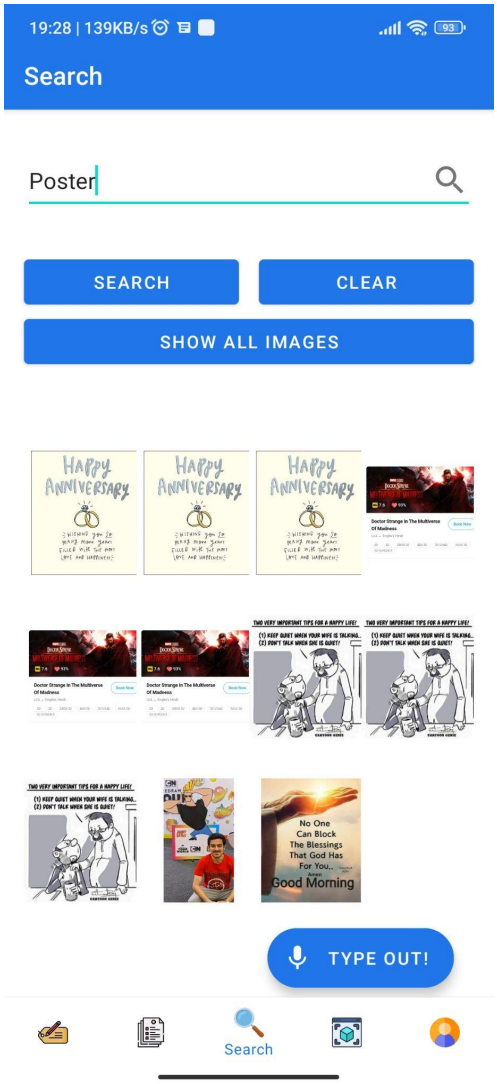
Labeling Page:



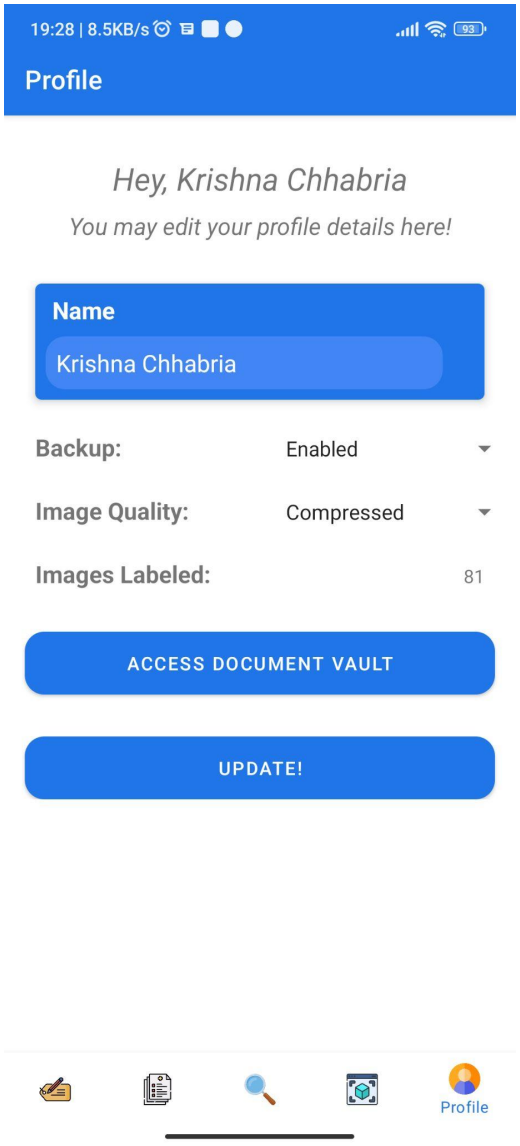
Text Extraction:



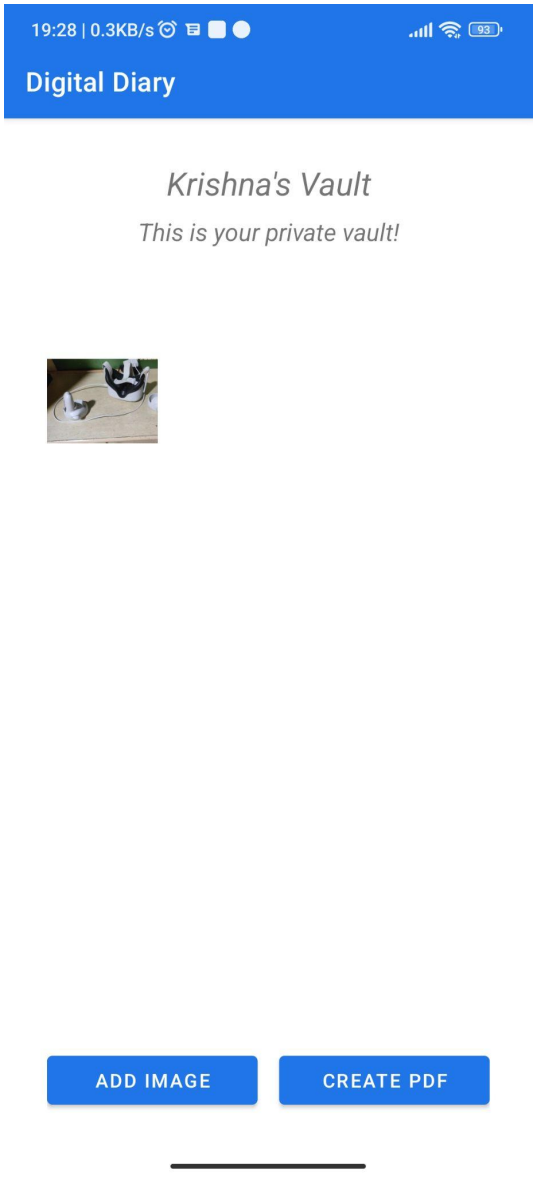
Search Page:


19:28 | 139KB/s
Search
Poster
SEARCH
CLEAR
SHOW ALL IMAGES
TYPE OUT!
Search

Profile Page:



Document Vault:



## 5.6 Test Cases:

| Test Id | Test Name | Test Description | Expected Output | Actual Output | Result |
|---|---|---|---|---|---|
| TC01 | Login Credentials | Login with Valid Username invalid password | Login Unsuccessful, please enter correct credentials | Login Unsuccessful, please enter correct credentials | PASS |
| TC02 | | Login with invalid Username Valid password | Login Unsuccessful, please enter correct credentials | Login Successful | PASS |
| TC03 | | Login with Valid Username and valid password | Login Successful | Login Successful | PASS |
| TC04 | User Form Selection | User can select the quality of image to upload | Quality Selected | Quality Selected | PASS |
| TC05 | Label Page | Allow the user to either take an image or select one | Display labels accurately and give the user an option to enter a custom one | Labels displayed & saved | PASS |
| TC06 | Find Page | Allow the user to enter a custom label to search for images and show all images with all labels | Displaying all images accurately. | Displaying all images accurately. | PASS |
| TC07 | Profile Page | Display user details submitted while filling the form | User details specific to that user | User details specific to that user | PASS |

# Chapter 6

## Documentation & Installation

---

This project has been implemented using Android Studio & Firebase. Various APIs such as iText (for PDF compilation & creation), Text Extraction (from Firebase APIs) & Object Detection (from Firebase APIs) are being used to implement the various features of the application.

Many in-built features of Android are used such as SQLite (for storing image records offline), Bitmap Compression (for compressing images), SharedPreferences (text file information storage system), Text-to-Speech (to read out the labels & objects identified) & Speech-to-Text (to interact with the app through voice) are being used to provide the user with a smooth experience.

# Chapter 7

## Future Enhancements

---

1. Implement & expand speech capabilities to allow the user to interact with the entire app.

2. Allow the user to create albums by selecting & labeling multiple images at once.

3. Allow the user to sort the existing images on the device according to date & location automatically after installing the app.

4. Expand the application's capabilities to support video files as well.

5. Provide statistics on the most popular & used labels.

6. Provide vital information on the amount of storage space the user has to backup their images to the cloud.

7. Sort images by identifying & categorizing them by face.

8. Allow the user to share specific images related to specific labels.

# Chapter 8

## Limitations

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1. The app requires a constant internet connection.
2. PNG files cannot be compressed at the moment for backup to the cloud.
3. Only image files are supported for various operations.
4. The app is currently available for Android only devices.

# Chapter 9

## Conclusion

---

This app provides an interface for the user to perform various operations with images such as object detection, labeling, text identification & even creating a secure document vault which allows the user to store sensitive documents and even share all of them at once on the fly.

Upon the completion of this project I can say that I have learnt various new concepts in Android such as SharedPreferences, used for local storage, SQLite, for offline database capabilities, & the overall file system structure of Android.

Various lossless compression algorithms can be applied which will help the user to backup their images to the cloud while reducing bandwidth consumption. Huffman Coding is a popular lossless compression algorithm which can be applied to images.

# Chapter 10

## References & Bibliography

---

The following resources were used for the development of this project:

https://cs.stanford.edu/people/eroberts/courses/soco/projects/data-compression/lossless/index.htm

https://loading.io/icon/c95muh

https://stories.uplabs.com/animated-icons-on-android-ee635307bd6

https://firebase.google.com/docs/ml/android/label-images-with-automl?hl=en&authuser=0

https://developers.google.com/android/guides/client-auth?authuser=0

https://console.cloud.google.com/apis/credentials?project=digital-diary-e7229

https://www.youtube.com/watch?v=EeLz1DPMsW8

https://medium.com/analytics-vidhya/how-to-take-photos-from-the-camera-and-gallery-on-android-87afe11dfe41

https://www.javatpoint.com/android-fragments