
**DR D.Y.PATIL POLYTECHNIC**

**Nerul, Navi Mumbai- 400 706**

**Project Synopsis**

**On**

# ANDROID OCR APPLICATION

**Submitted By**



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**COMPUTER ENGINEERING**

**Year 2020-2021**

| (Guide) | (H.O.D) | (Principal) |
|---|---|---|
| **Mr. Dhananjay Newalkar** | **Mr.Umesh Patil** | **Mr. N.P.Vetale** |

# ABSTRACT

In today's fast-paced world, people like things in shortcut – quickest, fastest, easiest, least effort path paradigm – and typing out text is no exception. A trend can be observed, majorly in college students, of clicking pictures of whatever they want to look at again. These include pictures of book covers, phone numbers, paragraphs from text books, notice boards, or even a random piece of text they found interesting on a poster in the mall. 6/10 students would prefer clicking pictures instead of typing things out, which is great if you have lots of physical memory on your phone and don't mind searching through thousands of images to find the one picture you're looking for. But what if there was an app on your phone that let you click a picture – just as you normally would – and instead of simply storing the image, the app let you select a region of interest in the image and have it instantly converted to plain text? As a college student who has been strictly following the "click pictures of everything you want to save for later" policy, this app would be immensely helpful for me, in addition to a lot of other people. And that is my motivation for developing this app as my TY project.

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# INDEX

# 1. INTRODUCTION

In the running world, there is growing demand for the software systems to recognize characters in computer system when information is scanned through paper documents as we know that we have number of newspapers and books which are in printed format related to different subjects. These days there is a huge demand in "storing the information available in these paper documents into a computer storage disk and then later reusing this information by searching process". One simple way to store information in these paper documents in to computer system is to first scan the documents and then store them as IMAGES. But to reuse this information it is very difficult to read the individual contents ind searching the contents form these documents line by line and word-by-word. The reason for this difficulty is the font characteristics of the characters in paper documents are different to font of the characters in computer system. As a result, computer is unable to recognize the characters while reading them. This concept of storing the contents of paper documents in computer storage place and then reading and searching the content is called DOCUMENT PROCESSING. Sometimes in this document processing we need to process the information that is related to languages other than the English in the world. For this document processing we need a software system called CHARACTER RECOGNITION SYSTEM This process is also called DOCUMENT IMAGE ANALYSIS (DIA). Thus our need is to develop character recognition software system to perform Document Image Analysis which transforms documents in paper format to electronic format. For this process there are various techniques in the world. Among all those techniques we have chosen optical Character Recognition as main fundamental technique to recognize characters.

# 2. LITERATURE SURVEY

The Shalin A. Chopra This paper tells about OCR system for offline handwritten character recognition. Preprocessing techniques used in document images as an initial step in character recognition systems were presented. The feature extraction step of optical character recognition is the most important. It can be used with existing OCR methods,especially for English text.

Dishank Rajesh Palan In this paper it presents an android application for accurate recognition and translation of text in varying environmental conditions, given an Android mobile having a camera

Line Eikvil This paper presents a review on OCR techniques. It also tells about the OCR process that converts text, present in digital image, to editable text and how it recognizes characters through optical mechanisms.

Pranob K Charles In this paper various approaches used for the design of OCR systems are discussed.It presents the techniques that are slow which provide better results in nature and also the fast techniques that provide inefficient results. In this it is found that the OCR techniques based on neural network provide more accurate results than other techniques.

Richa Goswami This paper presents detailed review in the field of Optical Character Recognition. Various techniques are determine that have been proposed to realize the center of character recognition in an optical character recognition system

# 3. ACQUISITION OF KNOWLEDGE

## 3.1 JAVA:

Java is a general purpose, object oriented programming language developed by Sun Microsystems of USA in 1991,which was originally called as 'Oak' by James Ghosling.

The Important feature of the language is that it is a platform-neutral language. Java is the First Programming language,which is not tied to any particular hardware or operating system.Program developed in Java can be executed anywhere on a system.

## 3.2 ANDROID STUDIO :

Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development. It is available for download on Windows, macOS and Linux based operating systems or as a subscription-based service in 2020. It is a replacement for the Eclipse Android Development Tools (E-ADT) as the primary IDE for native Android application development.

Android Studio supports all the same programming languages of IntelliJ (and CLion) e.g. Java, C++, and more with extensions, such as Go and Android Studio 3.0 or later supports Kotlin and "all Java 7 language features and a subset of Java 8 language features that vary by platform version." External projects backport some Java 9 features. While IntelliJ states that Android Studio supports all released Java versions, and Java 12, it's not clear to what level Android Studio supports Java versions up to Java 12 (the documentation mentions partial Java 8 support). At least some new language features up to Java 12 are usable in

Android. Once an app has been compiled with Android Studio, it can be published on the Google Play Store. The application has to be in line with the Google Play Store developer content policy.

### 3.3 MACHINE LEARNING FOR MOBILE DEVELOPERS:

ML Kit brings Google's machine learning expertise to mobile developers in a powerful and easy-to-use package. It is used to make your iOS and Android apps more engaging, personalized, and helpful with solutions that are optimized to run on device. ML Kit's processing happens on-device. This makes it fast and unlocks real-time use cases like processing of camera input. It also works while offline and can be used for processing images and text that need to remain on the device. With ML Kit's text recognition APIs can recognize text in any Latin-based character set. They can also be used to automate data-entry tasks such as processing credit cards, receipts, and business cards.

### 3.4 Tesseract

Tesseract is an optical character recognition engine for various operating systems. It is free software, released under the Apache License. Originally developed by Hewlett-Packard as proprietary software in the 1980s, it was released as open source in 2005 and development has been sponsored by Google since 2006.

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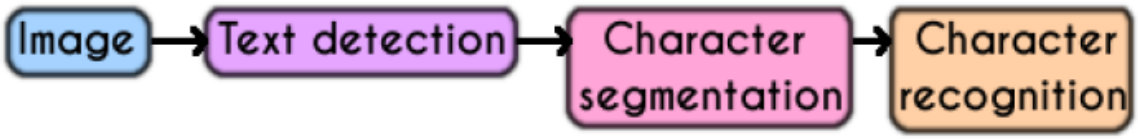
# 4 . ANDROID OCR APPLICATION

The Optical Character Recognition is a technology that allows a computer to create text strings out of scanned images or, in our case, an image that is captured with a user's smart phone/tablet.

The OCR Application will run according to three major steps:

1. **Text Detection:-** First we go through the image and find the regions where there is text in an image. The highlighted area shows some text that a Photo OCR system may find.
2. **Character Segmentation:-** Second, given the rectangle around the text region, we can do character segmentation where we segment the rectangle out into the locations of the individual characters.
3. **Character Classification:-** And finally, having segmented it out into individual characters, we can then run a classifier which looks at the images of the individual characters and tries to figure out the letters. And so on, till you find out what all the characters are and what the entire text is.




## Advantage :-

- Information of OCR can be readable.
- Processing of OCR information is fast
- This process is much faster as compared to the manual typing the information into the system

- A paper based form are often became an electronic form which is straightforward to store or send by mail
- It is cheaper than paying someone amount to manually enter great deal of text data

## Disadvantage:-

- Not 100% accurate, there are likely to be some mistakes made during the process.
- All documents need to be checked over carefully and then manually corrected
- Handwritten notes may be difficult to detect texts.

# 5. SYSTEM REQUIREMENT

## HARDWARE REQUIREMENTS:

| | | |
|---|---|---|
| PROCESSOR | : | Intel dual Core ,i3 |
| RAM | : | 2 GB |
| HARD DISK | : | 100 GB |

## SOFTWARE REQUIREMENTS:

| | | |
|---|---|---|
| OPERATING SYSTEM | : | Windows 7 or Above |
| PROGRAMMING LANGUAGE | : | Java/Python. |
| OTHER REQUIREMENTS | : | Firebase Machine Learning Kit/Tesseract |

# 6. PROBLEM DEFINATION

The problem here is for the software systems to recognize characters in computer system when information is scanned through paper documents as we know that we have number of newspapers and books which are in printed format related to different subjects. Whenever we scan the documents through the scanner, the documents are stored as images such as jpeg, gif etc., in the computer system These images cannot be read or edited the user But to reuse this information it is very difficult to read the individual contents and searching the contents form these documents line-by-line and word-by-word. These days there is a huge demand in storing the information available in these paper documents into a computer storage disk and then later editing or reusing this information by searching process

## 6.1 PROPOSED SYSTEM

Our proposed system is OCR on a Android Studio which is a character recognition system that supports recognition of the characters.

The basic needs and flow of the application are:

- User starts app
- User clicks button to start OCR
- User holds phone over a piece of text and clicks the picture
- App processes picture
- Text is displayed to the user

The app will turn it into copy-able text you can then paste anywhere in your phone—a document editor, your note-taking app, Gmail, SMS, or anything else you could imagine.

**To make the above possible, the following input => process => output layout is required.**

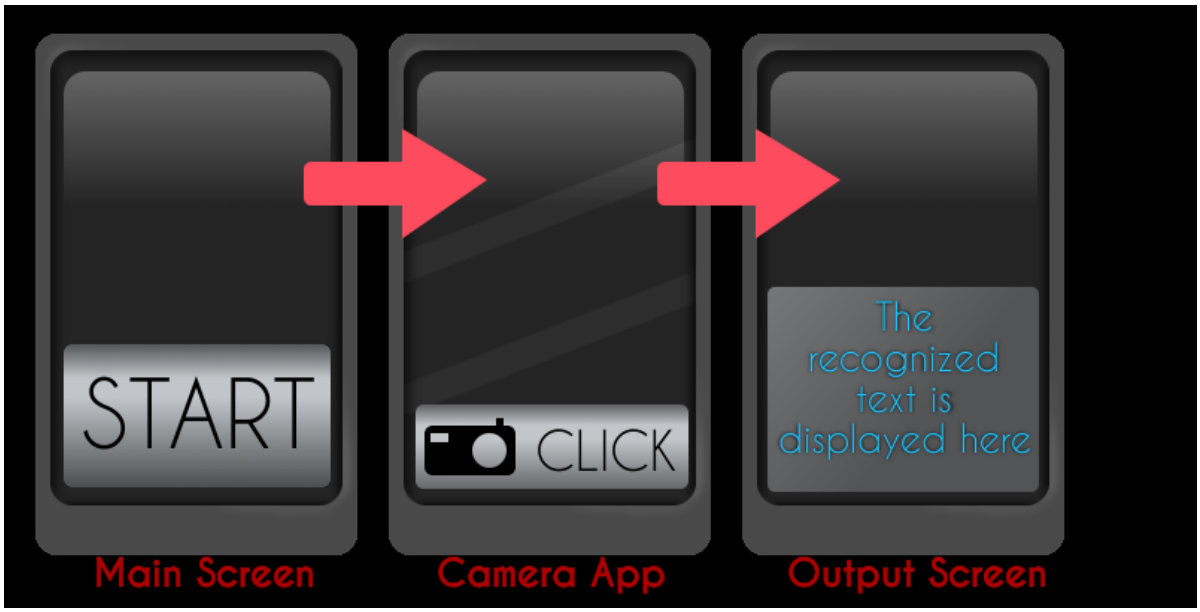
**Input** => The ability to click a picture from within the app.

**Process** => The actual text recognition module

**Output** => The recognized text.

Additionally, some pre-processing might be required to clean up noisy images for better accuracy.

Minimal user interface requirements are demonstrated as follows:-

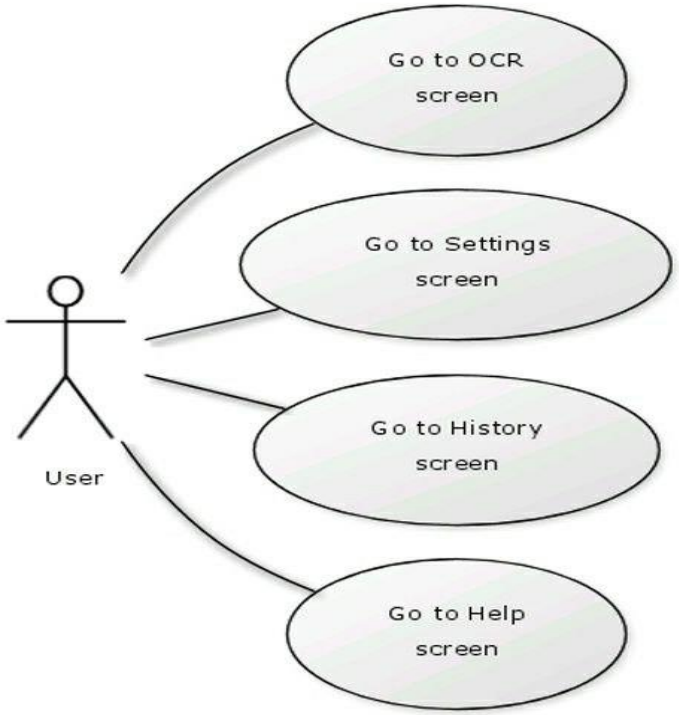


# 7. DESIGINING

## 7.1 Functional Diagram

Use Case Diagram:-

A use case diagram at its simplest representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved.



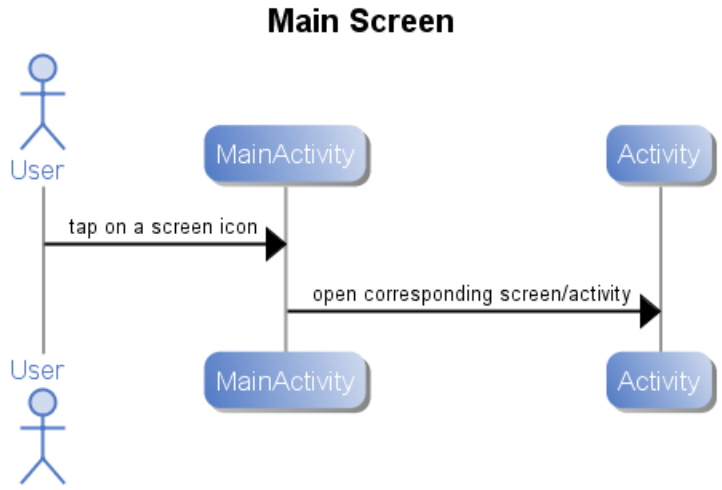

Main Screen

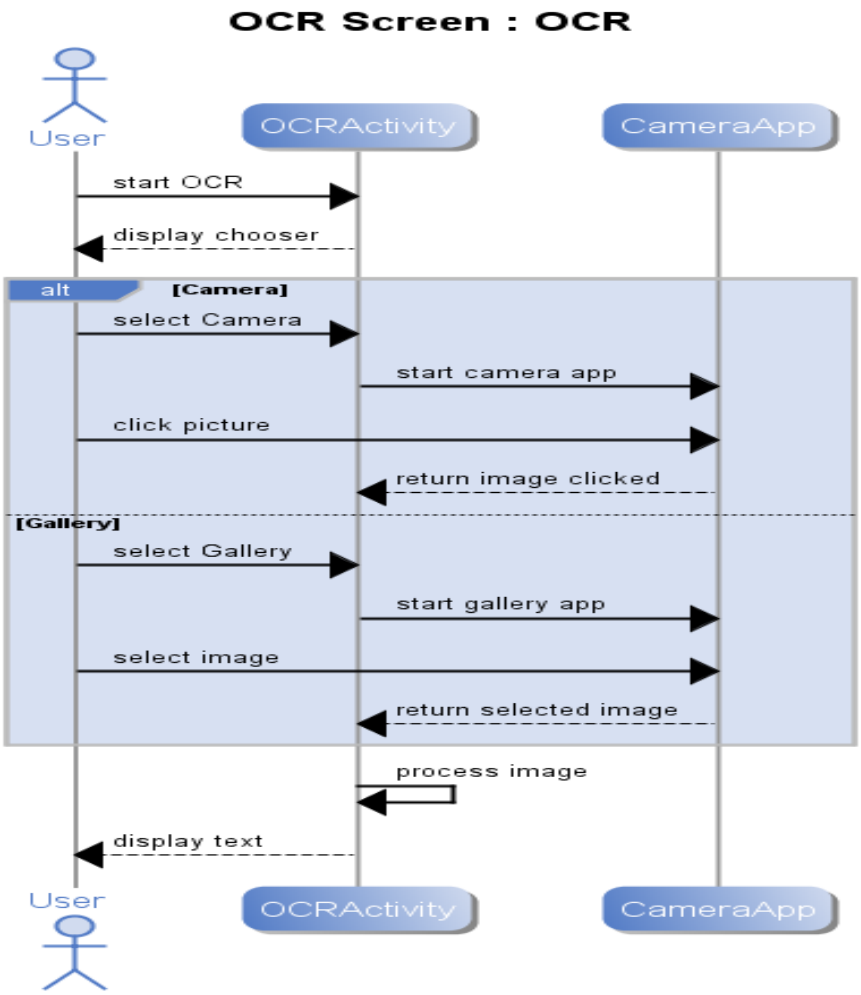
ER-Diagram:-

An entity relationship model describes interrelated things of interest in a specific domain of knowledge. A basic ER model is composed of entity types and specifies relationship that can exist between entities

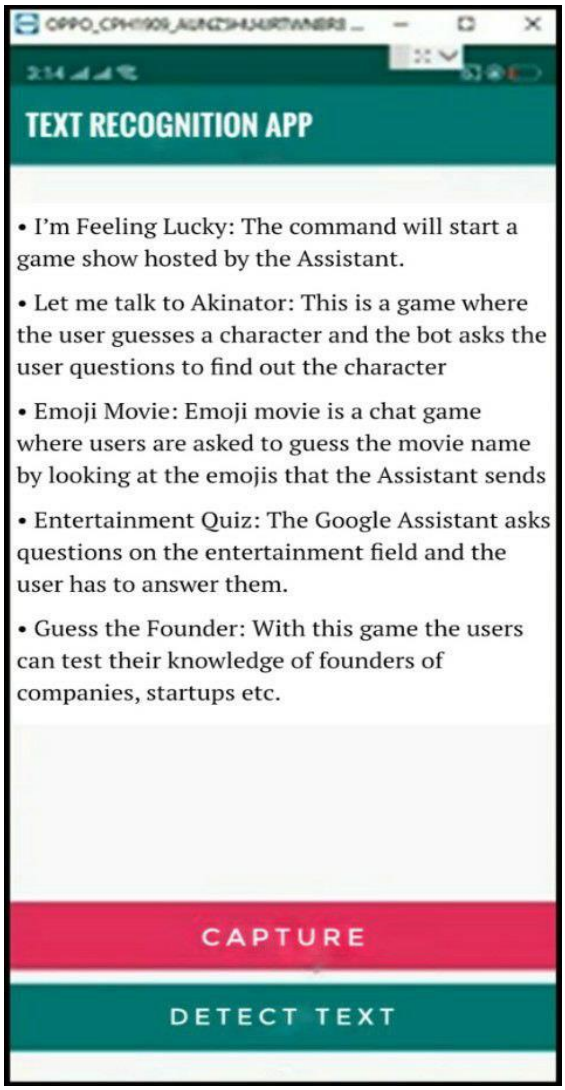

Sequence Diagram :-

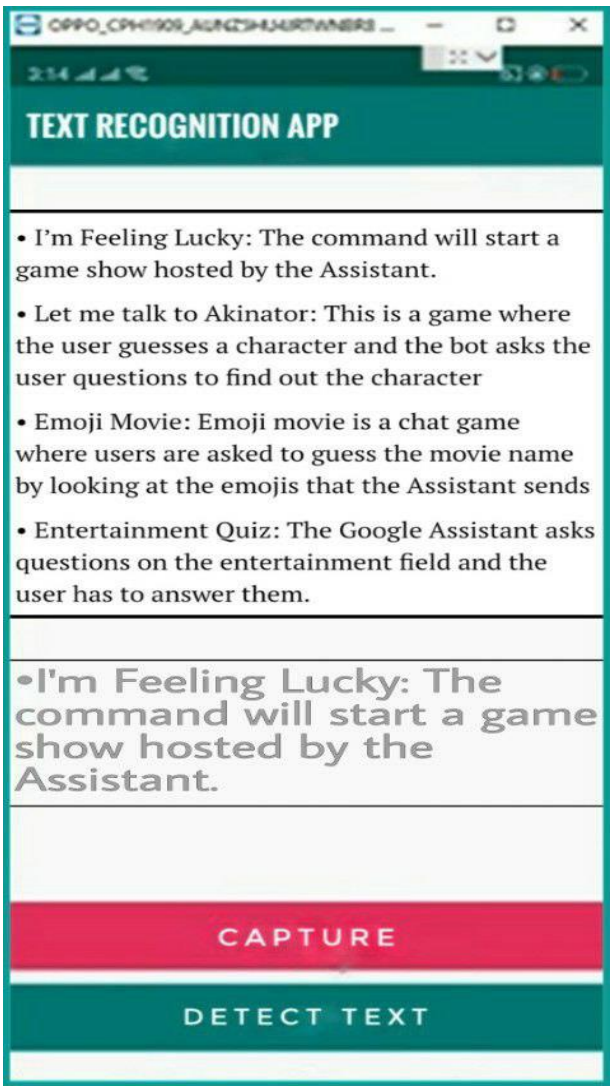
A sequence diagram shows object interactions arranged in time sequence. It depicts the object and classes involved in the scenario and the sequence of message exchanged between the object needed to carry out the functionality of the scenario.




OCR Screen : OCR
User
OCRActivity
CameraApp
start OCR
display chooser
alt
[Camera]
select Camera
start camera app
click picture
return image clicked
[Gallery]
select Gallery
start gallery app
select image
return selected image
process image
display text
User
OCRActivity
CameraApp

## 7.2 Interface Design



# 8. FUTURE SCOPE

In future, the project can be enhanced by the following points:

- Automatically adding tags to images for quicker searches.
- Recognizing hand-written text.
- Text with messy backgrounds.
- Automatically recognizing and saving phone numbers to contacts
- Automatic detection of text regions in scene images.
- Improved accuracy and efficiency.

# 9. CONCLUSION

We Developed Android OCR applications in Java by making use of Android Studio and Machine Learning. These software is portable, efficient, and easily maintainable. This paper provides a detailed discussion about offline image to text recognition through an android app. The image is loaded into the Android app and the users are provided the choice to select the part of image to be converted, Then the image is processed by OCR technique to produce the converted text on screen. The concepts involved can further be used to boost the future technology like handwriting recognition or recognition of many more languages and even for translation purpose.

# 10. APPLICATION

- Probably the most well known use case for OCR is converting printed paper documents into machine-readable text documents.
- The text of the document can be edited with word processors like Microsoft Word or Google Docs.
- OCR technology include data entry automation, indexing documents for search engines.
- OCR technology has proven immensely useful in digitising historic newspapers and texts that have now been converted into fully searchable formats and had made accessing those earlier texts easier and faster

# 11. BIBLIOGRAPHY

Sites Referred for the project are as follows :

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# CERTIFICATE

This is to certify that Mr./~~Ms~~.____**Shreyas Sandeep Varadkar**_____from (institute) ____**Dr. D. Y. Patil Polytechnic**____ having Enrollment No. __**1905480026**__has completed Project Planning Report having title **Android OCR Application** Individually in a group consisting of __**4**__ candidates under the guidance of the Faculty Guide.

Name & Signature Of Guide _**Mr.Dhananjay Newalkar**_

Name & Signature Of H.O.D __**Mr. Umesh Patil**_

**Evaluation Sheet (ESE)**

**For**

**Capstone Project Planning**

Name Of Student:- **Shreyas Sandeep Varadkar** Enrollment No.:- **1905480026**

Name Of Program:- **Computer Engineering** Semester:- **V**

Title Of the Capstone Project:- **Android OCR Application.**

**A. POs Addressed by the Capstone Project (Mention only those predominant POs)**

a) To Provide opportunity to students to learn the latest trends in computer technology.
b) Exhibit their technical skills to analysis and design appropriate solution.
c) To prepare students to face global challenges in global society.
d) To purse higher education by applying knowledge and prepare students to be self entrepreneurs in future opportunities

**B. Cos Addressed by the Capstone Project (Mention only those predominate (COs)**

a) With problem specification in existing systems related to the occupation.
b) Select, collect and use required information to solve the problem.
c) Logically relevant possible solutions.
d) Consider the ethical issues related to the project.

**C. Other learning outcomes achieved through this project**

**1. Unit Outcomes (Congnitive Domain)**

a) Identify the problems in the area related to their program.
b) Identify the information suggesting the cause of the problems and possible solutions.
c) Access the feasibility of different solutions and financial implications.
d) Confidently answer the question about the project.

**2. Practical Outcomes (in psychomotor Domain)**

a) Integrate the competencies acquired by the students in the current semester.
b) Provide the opportunity for interdisciplinary work in tackling problems likely to be faced by them in industries which are existing and challenging.

**3. Affective Domain Outcomes:-**

a) Acknowledge the help rendered by the others in the success of the project.
b) Work effectively and persistently to present features of the project.
c) Work independently in the group.

| PROGRESSIVE ASSEMENT (PA) SHEET | | | |
|---|---|---|---|
| **Sr. no** | **Criteria** | **Max Marks** | **Marks Obtainted** |
| 1 | Problem Identification / Project Title | 10 | |
| 2 | Industrial Survey and Literature Review | | |
| 3 | Punctuality and overall contribution | | |
| 4 | Project Diary | | |
| 5 | Report Writing Including Documentation | 10 | |
| 6 | Presentation | 05 | |
| Total | | 25 | |

**Name and Signature Of Project Guide:**

# CERTIFICATE

This is to certify that Mr./~~Ms~~.____**Shreyash Chandrika Yadav**_____from (institute) ____**Dr. D. Y. Patil Polytechnic**____ having Enrollment No. __**1905480022**__has completed Project Planning Report having title **Android OCR Application** 2Individually in a group consisting of __**4**__ candidates under the guidance of the Faculty Guide.

Name & Signature Of Guide __**Mr. Dhananjay Newalkar** _

Name & Signature Of H.O.D __**Mr. Umesh Patil**_

**Evaluation Sheet (ESE)**

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**Capstone Project Planning**

Name Of Student:- **Shreyash Chandrika Yadav** Enrollment No.:- **1905480022**_

Name Of Program:- **Computer Engineering** Semester:- **V**

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Name & Signature Of Guide **Mr. Dhananjay Newalkar**

Name & Signature Of H.O.D **Mr. Umesh Patil**

**Evaluation Sheet (ESE)**

**For**

**Capstone Project Planning**

Name Of Student:- **Abhishek Pravin Shirsath** Enrollment No.:- **1905480014**

Name Of Program:- **Computer Engineering** Semester:- **V**

Title Of the Capstone Project:- **Android OCR Application** `

**A. POs Addressed by the Capstone Project (Mention only those predominant POs)**

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**C. Other learning outcomes achieved through this project**

1. **Unit Outcomes (Congnitive Domain)**

a) Identify the problems in the area related to their program.
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c) Access the feasibility of different solutions and financial implications.
d) Confidently answer the question about the project.

2. **Practical Outcomes (in psychomotor Domain)**

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Name & Signature Of Guide _**Mr. Dhananjay Newalkar**_

Name & Signature Of H.O.D __**Mr. Umesh Patil**__

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