Rajiv Gandi University of Knowledge and Technologies,
RK Valley

Mini Project Report E3 SEM-1 Mini Project (2018 – 2019)

Submitted by

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ORIGINAL DEGREE APPLICATION

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CERTIFICATE

This is to certify that this work entitle " **Original Degree Application** " was successfully carriedout by **Praneeth (R141585), Sushma (R141401), Usha (R141402), Pushpa (R141417)** in fulfilment of the requirements leading to award the credits for **E3 SEM-1 Mini Project / Project** in Computer Science by Rajiv Gandi University of Knowledge and Technologies, RK Valley during the academic year 2018-2019.

Project Guide
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Abstract-

We are providing an Android App, which makes easier for students to apply their Original Degree. In now days, the students after passed out from college there will settle in different places.This application will helpfull for them to get certificates from college to their currently living places.

Introduction :

In my project , we have developed a Application that needs to help the students who are passed out from the college and want to get there certificates from college, but there so far and there didn't even have time to go to college and get their certificates . All will be in busy in there daily life . So our Application called OD Application or Original Degree Application helps them to get their certificates in couirer safely to their living places . But , first there should have to fill there application and needed to complete all verification and then there can be furthur proceeded to get there certificates.

Requirement Analysis :

The project needs several requirements to be gathered before processing to develop the OD Application. One among them includes gathering images and source codes about the firebase functions like adding, deleting, replacing, image storing, authentication . The other codes are navigation view , tablayout, recycler view, menus, layout inflaters etc ..... The Application is gathered form JNTU web site and implemented our Applicaiton which is not present in the JNTU site and it makes our Applicaiton more secure .

It was noted more than 50% of the Android devices are using the version of kitkat or more . The functionality requirements of the application is simple and straightforward where as the technial details involved research on the available android technologies.

User interface is most important for any android application and android has multiple facilites for drawing user interface for applications. Few study materials in android to code with the concepts like libaries view and animations were also gathered so as to smooth the application development process. These gathered information helped to provide a clear direction of deciding the software requirements and hardware requirements.

Theory-

<u>Android</u> :

Android is a Linux-based operating system designed primarily for touchscreen mobile devices such as smartphones and tablet computers.Initially developed by Android, Inc., which Google backed financially and later bought in 2005. Android is open source and Google releases the code under the Apache License. This open source code and permissive licensing allows the software to be freely modified and distributed by device manufacturers, wireless carriers and enthusiast developers. Additionally, Android has a large community of developers writing applications ("apps") that extend the functionality of devices, written primarily in a customized version of the Java programming language.

Android software development is the process by which new applications are created for the Android operating system. Applications are usually developed in the Java programming language using the Android Software Development Kit. ADT (Android Development Tools) is the software used to develop android apps. It basically encases Eclipse IDE,which is a multi-language Integrated development environment (IDE) comprising a base workspace and an extensible plug-in system for customizing the environment .. The latest version comes with ADT plugin preinstalled and bundled to the IDE.Application programming interface (API) specifies how some softwarecomponents should interact with each other.

Application is developed by using the Google based Technologies i.e; Android Studio and Firebase Cloud. Implementing the Application in the Android Studio and connecting to the Firebase Cloud. We are using Sql database for the connection.

Firebase :

     Firebase is a Backend-as-a-Service BaaS-that started as a YC11 startup and grew up into a next-generation app-development platform on Google Cloud Platform. Firebase frees developers to focus crafting fantastic user experiences. You don't need to manage servers. You don't need to write APIs. Firebase is your server, your API and your datastore. All this Features are managed by the Google. It provides the following features :

                    1.Realtime Database
                    2.Authentication
                    3.File Storing
                    4.Hosting
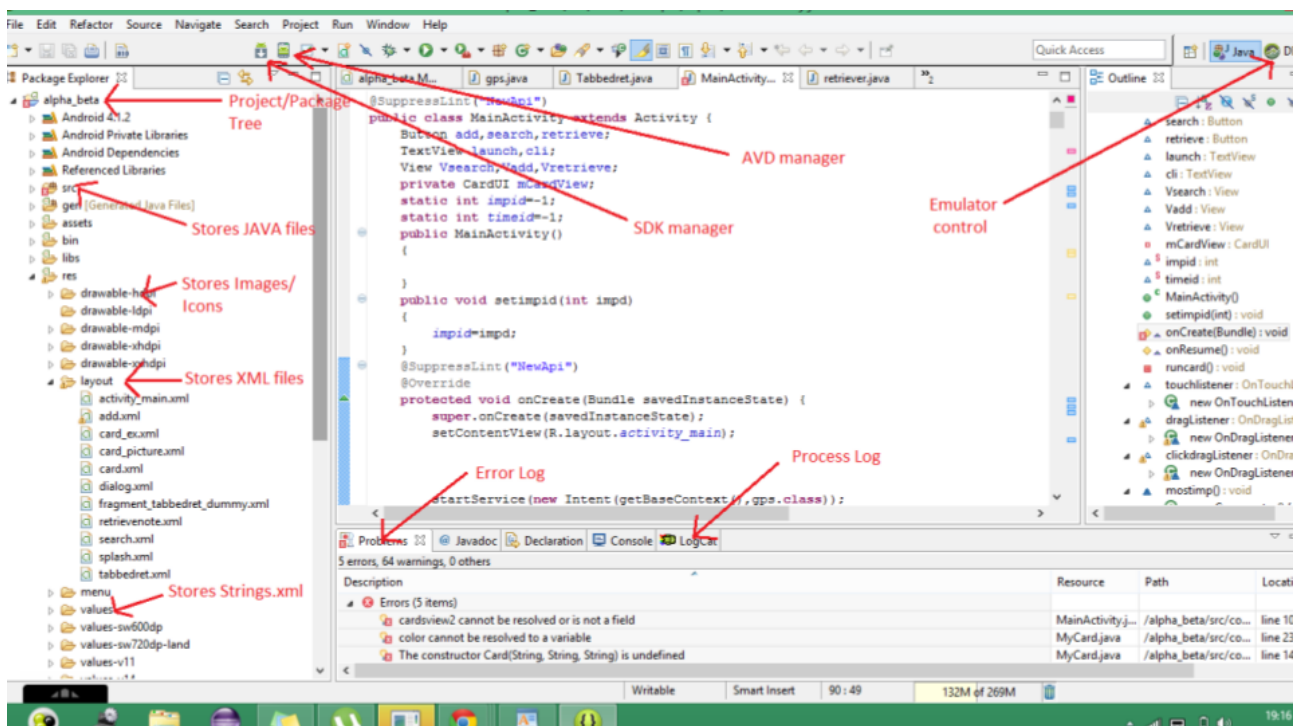
Our Approach :

Introduction :

   This document has requiments of Original Degree Application.
This app is usefull for the passedout students of a university.

Technologies :

   Android studio, Firebase .

Software Requirements :

|		
Operating System	:	SmartPhone Software
Development Kit	:	Android Studio 2.0 or higher versions
Database	:	Cloud Storage, Image Storing.
Debugger Tool	:	Android Device
Authentication	:	Firebase Authentication
Technologies	:	Java, Firebase Commands, Android Studio, JSON, API.

Hardware Requirements :

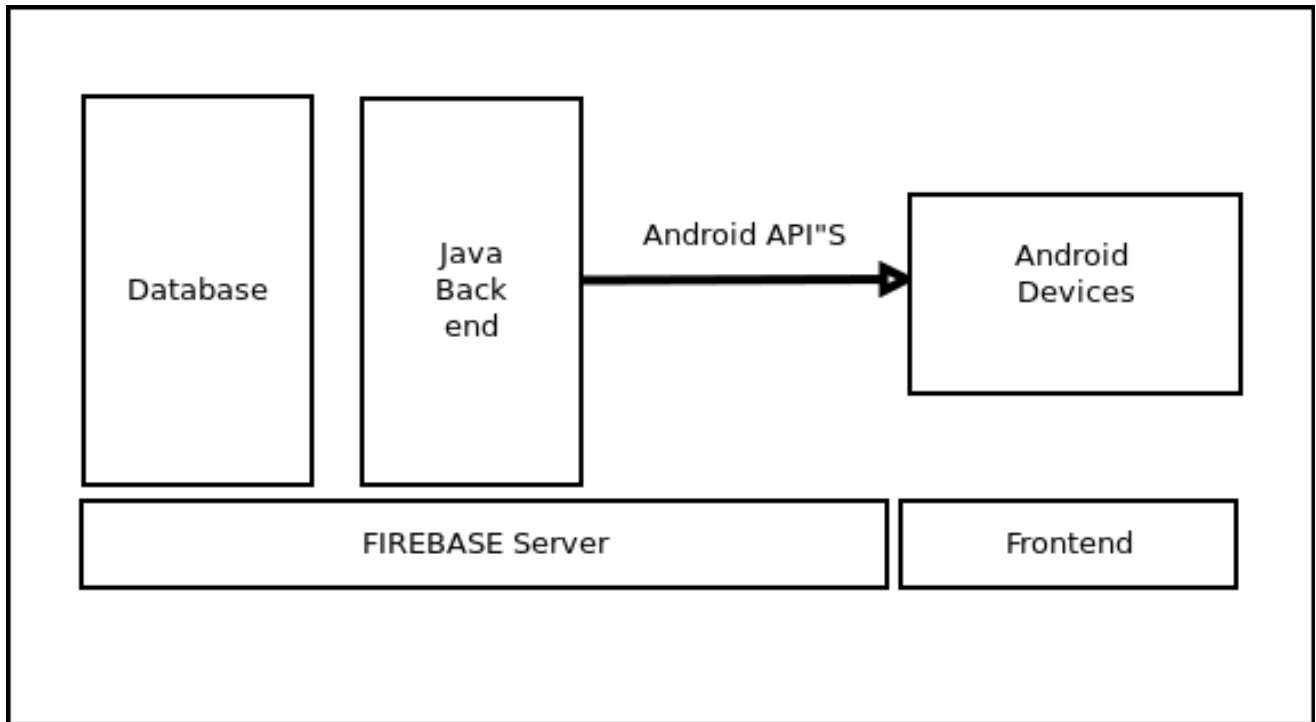|		
Development	:	System with minimum 8gb ram
Server	:	Firebase Cloud Services
Testing	:	Emulator or Android Mobile

Context Diagram :

Original certification app is used to It is overall usefull for the passedout students of a university.
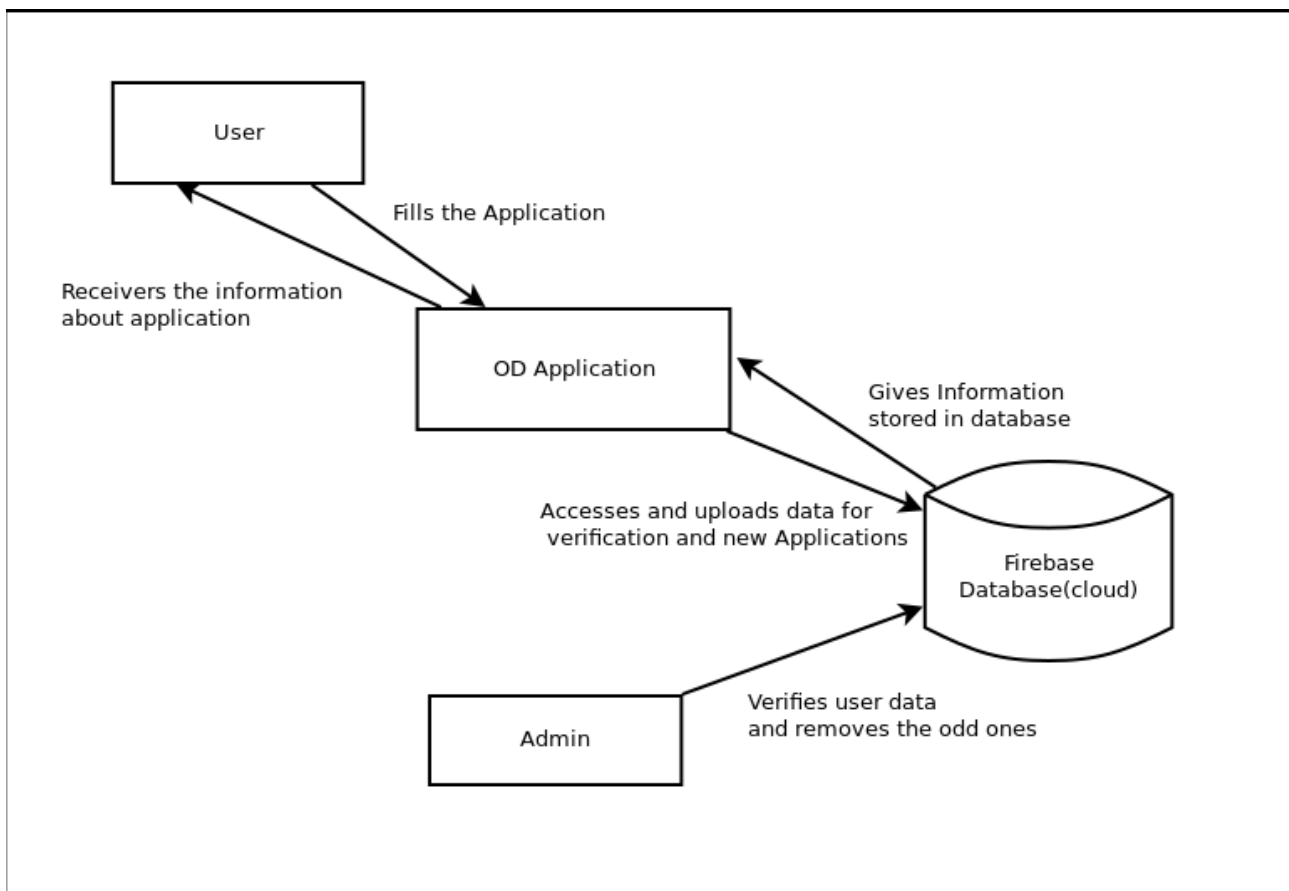
Class Diagram :
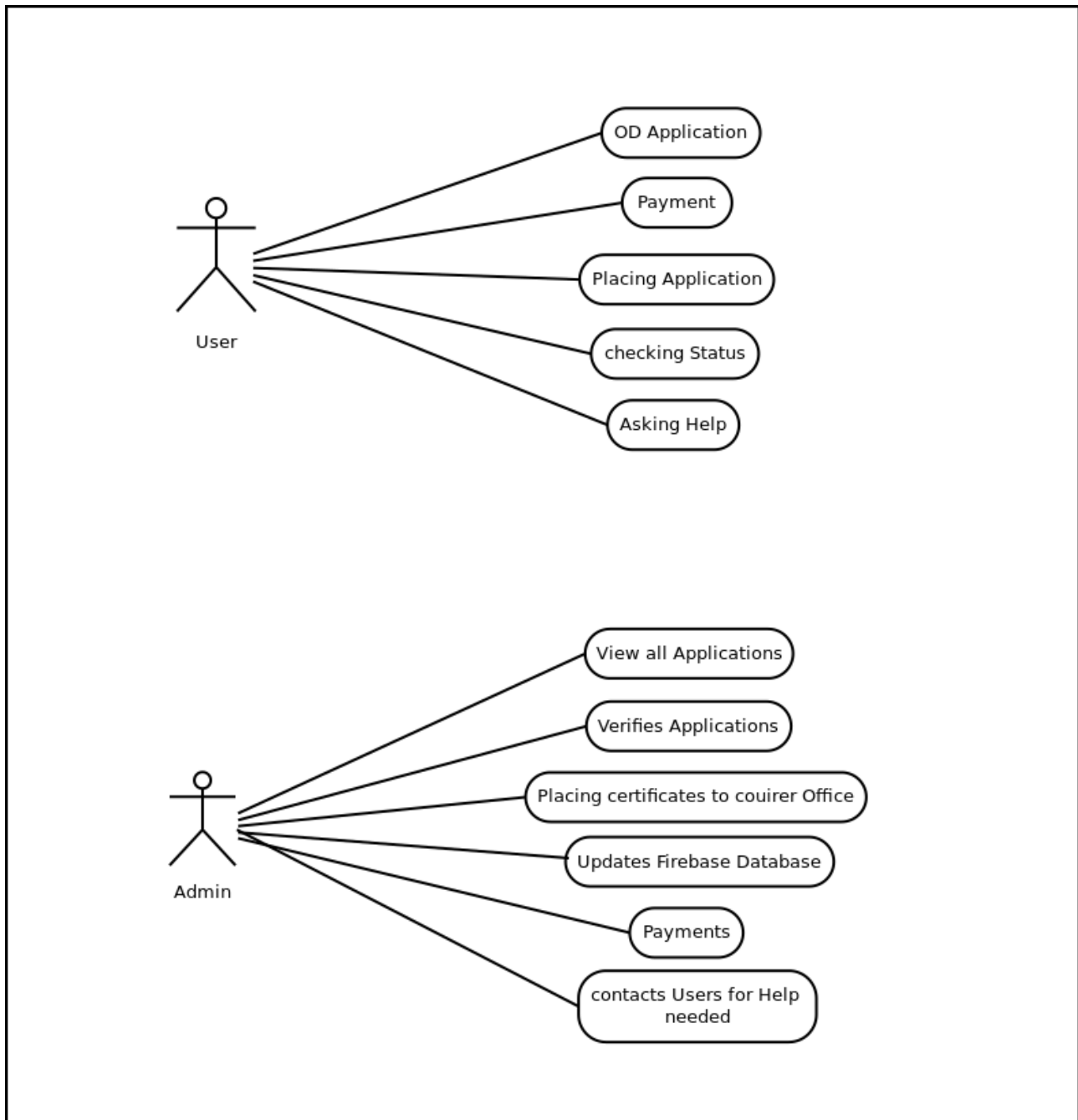
System Architecture :

Contents :

API's :

     API is the acronym for Application Programming Interface, which is a software intermediary that allows two applications to talk to each other. Each time you use an app like Facebook, send an instant message, or check the weather on your phone, you're using an API.

     Application programming interface (API) specifies how some software components should interact with each other. In practice in most of the cases an API is a library that usually includes specification for routines, data structures, object classes, and variables. An API specification can take many forms, including an International Standard such as POSIX, vendor documentation such as the Microsoft Windows API, the libraries of a programming language, e.g., Standard Template Library in C++ or Java API.

<u>JSON</u> :

JSON, or JavaScript Object Notation, is a minimal, readable format for structuring data. It is used primarily to transmit data between a server and web application, as an alternative to XML. Squarespace uses JSON to store and organize site content created with the CMS.

The two primary parts that make up JSON are keys and values. Together they make a key/value pair.

- •**Key** - A key is always a string enclosed in quotation marks.
- •**Value** - A value can be a string, number, boolean expression, array, or object.
- •**Key/Value Pair** - A key value pair follows a specific syntax, with the key followed by a colon followed by the value. Key/value pairs are comma separate

Types of Values
- •**Array:** An associative array of values.
- •**Boolean:**True or false.
- •**Number:** An integer.
- •**Object:** An associative array of key/value pairs.
- •**String:** Several plain text characters which usually form a word.

<u>Arrays</u>

Almost every blog has categories and tags. In this example we've added a categories key, but the value might look unfamiliar. Since each post in a blog can have more than one category, an array of multiple strings is returned.

<u>Objects</u>

An object is indicated by curly brackets. Everything inside of the curly brackets is part of the object. We already learned a value can be an object. So that means "foo" and the corresponding object are a key/value pair.

JAVA Programming :

Java is a popular general-purpose programming language and computing platform. It is fast, reliable, and secure. According to Oracle, the company that owns Java, Java runs on 3 billion devices worldwide.

Considering the number of Java developers, devices running Java, and companies adapting it, it's safe to say that Java will be around for many years to come.

Features of Java Programming Language :

Java is platform independent :

Java was built with the philosophy of "write once, run anywhere" (WORA). The Java code (pure Java code and libraries) you write on one platform (operating system) will run on other platforms with no modification.

To run Java, an abstract machine called Java Virtual Machine (JVM) is used. The JVM executes the Java bytecode. Then, the CPU executes the JVM. Since all JVMs works exactly the same, the same code works on other operating systems as well, making Java platform-independent.

1. **An object-oriented Language**

   There are different styles of programming. Object-oriented approach is one of the popular programming styles. In object-oriented programming, a complex problem is divided into smaller sets by creating objects. This makes your code reusable, has design benefits, and makes code easier to maintain.

Many programming languages including Java, Python, and C++ has object-oriented features. If you are serious about programming, you should definitely learn object-oriented style of programming.

2. **Java is fast**

The earlier versions of Java were criticized for being slow. However, things are completely different now. The new JVMs are significantly faster. And, the CPU that executes JVM are also getting more and more powerful.

Now, Java is one of the fastest programming languages. Well optimized Java code is nearly as fast as lower level languages like C/C++, and much faster than Python, PHP etc.

3. **Java is secure**

The Java platform provides various features for security of Java applications. Some of the high-level features that Java handles are:

- provides secure platform for developing and running applications
- automatic memory management, reduces memory corruption and vulnerabilities
- provides secure communication by protecting the integrity and privacy of data transmitted

4. **Large Standard Library**

One of the reasons why Java is widely used is because of the availability of huge standard library. The Java environment has hundreds of classes and methods under different packages to help software developers like us. For example,

java.lang - for advanced features of strings, arrays etc.

java.util - for data structures, regular expressions, date and time functions etc.

java.io - for file i/o, exception handling etc.

<u>Applications of Java</u> :

Java technology is everywhere, powering 3 billion devices worldwide. It's more than likely that you have used Java one way or the other. Here are some of the applications of Java.

1. **Android apps** - Java programming language using Android SDK (Software Development Kit) is usually used for developing Android apps.

2. **Web apps** - Java is used to create Web applications through Servlets, Struts or JSPs. Some of the popular web applications written in Java are: Google.com, Facebook.com, eBay.com, LinkedIn.com etc.
   It's important to note that, these sites may not be entirely written in Java, and may use other programming languages along with Java.

3. **Software Development** - Softwares like Eclipse, OpenOffice, Vuze, MATLAB etc use Java.

4. **Big Data Processing** - You can use popular software framework like Hadoop (which itself is written in Java) to process Big Data. To use Hadoop, you need to understand Java programming.

5. **Trading System** - You can build trading applications having low latency using the Oracle Extreme Java Trading Platform.

6. **Embedded Devices** - While C/C++ programming languages are still popular choices for working with embedded systems, Oracle's Java Embedded technologies provide platform and runtime for billions of embedded devices like: televisions, SIM card, Blu-ray Disc players etc.

Activites :

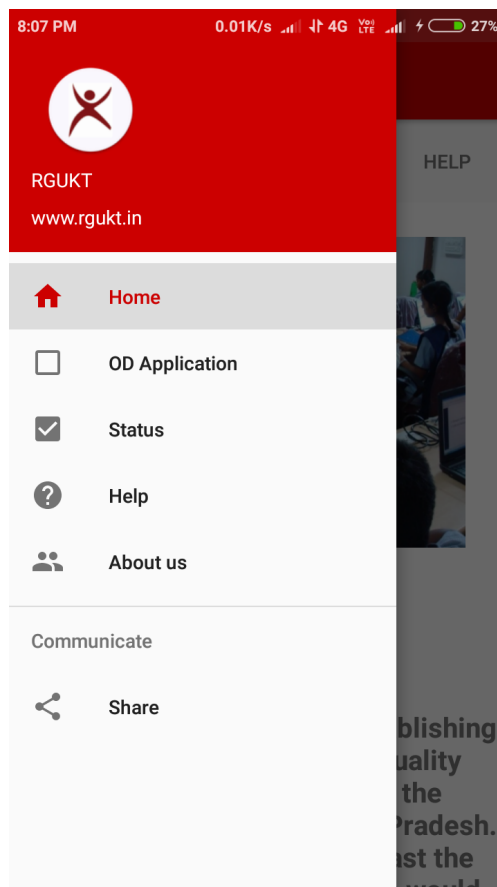The app is mainly consists of One Activity that is

1. Main Acitivty

MainActivity :

The Main Activity contains a Side Navigation Drawer with the 5 fragments. The Fragments are

1. Home Fragment
2. OD Application Fragment
3. Checking Status Fragment
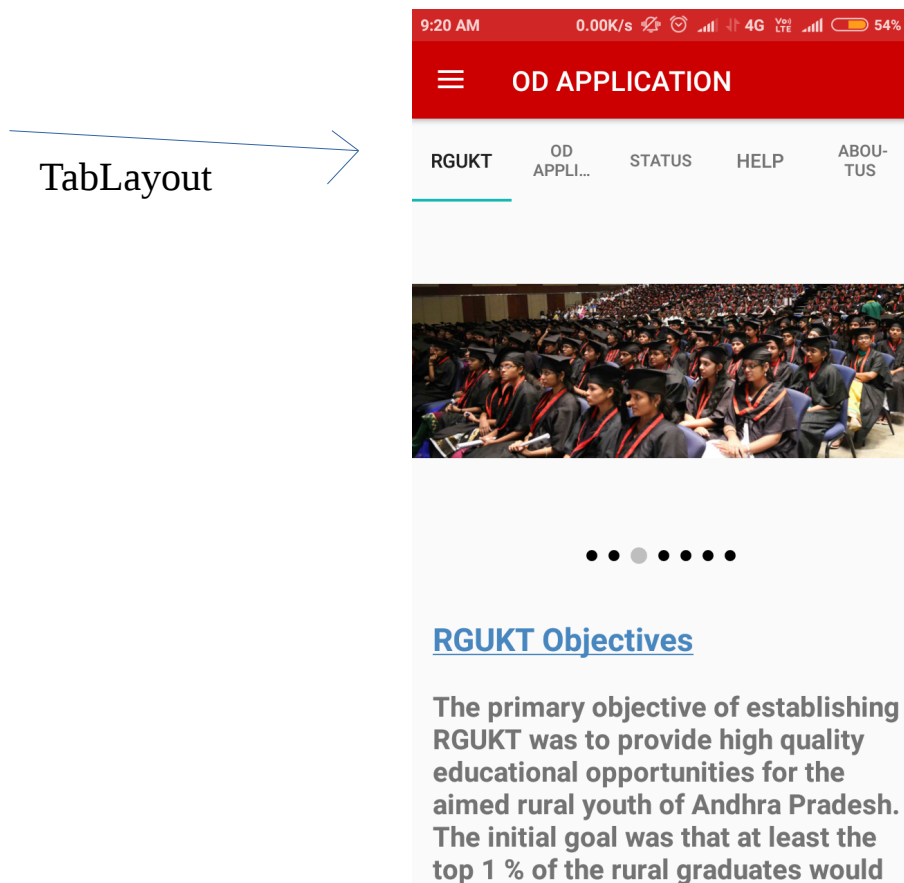4. Help Desk Fragment
5. Credits Fragment

ScreenShot :

<u>Home Fragment</u> :

        The Home fragment contains again a tab layout with 5 fragments and the fragments are 4 from the main activity and one extra fragment is RGUKT Fragment .

        1. RGUKT Fragment
        2. OD Application Fragment
        3. Checking Status Fragment
        4. Help Desk Fragment
        5. Credits Fragment

<u>Screenshots</u> :

TabLayout

RGUKT Fragment :

On opening to the fragment it contains a Image Slide Show, dots to represent the each image and the Objectives of the RGUKT University and some information about the college . The Image Slide show consists of 6 images which are connected by layout inflater and view will be in viewpager. The Timer count is present which will automatically slide the images after the time limit exceed . The RGUKT Objectives and some information about RGUKT is placed in a scroll view . The image slide view and scrollview contents are combined in a linear layout of vertical orientation .
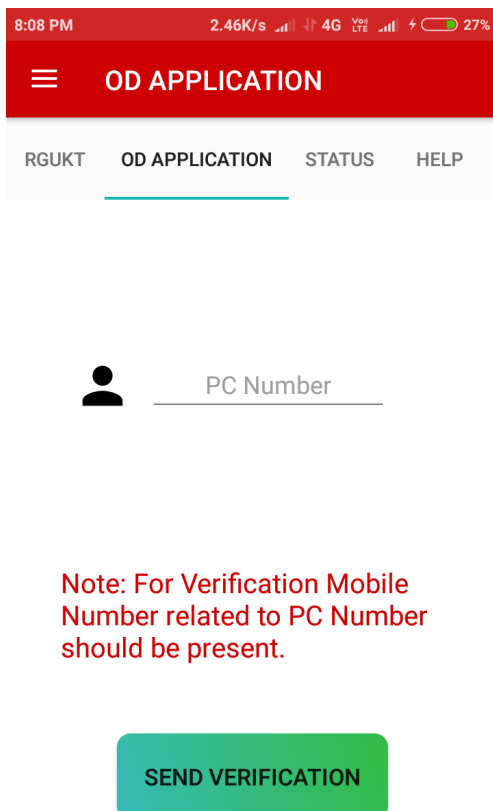
ScreenShots :
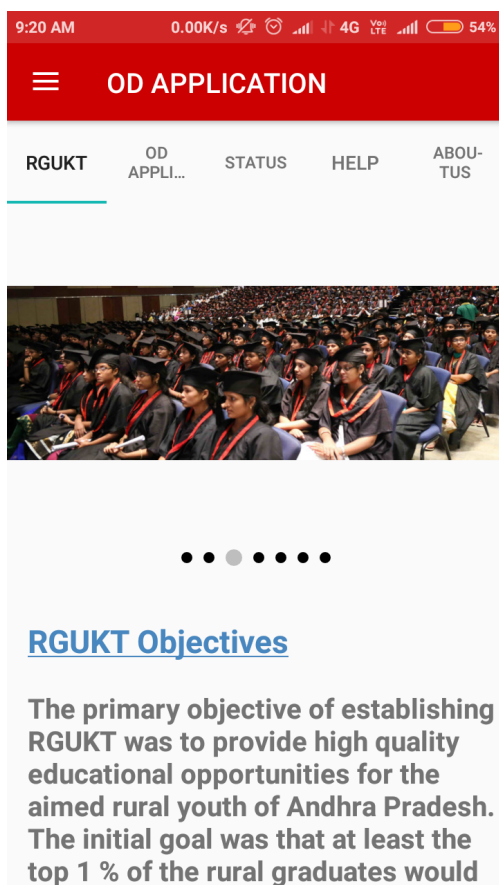
<u>OD Application Fragment</u> :

       The OD Application Fragment is main concept of the project of the APP . The Editext field takes the PCNumber of the applicant and checks whelther is the college number or not (or) is he already applied or not . If not then it sends a OTP to the applicant mobile number which given in the college . Once the verification is done the app redirects to the Application form of the college . After filling all the fields of the Application the applicant redirects to the selection of the payment type , where he have to choose mode to get the certificates after the convaction or the before the convaction or in the convaction . After that the Applicant have to pay the money according to the selection of the mode . At last the Applicant gets a copy of the application that he applied , order number and shows the application success . Then it redirects to the home page.

<u>Screenshots</u> :

Checking Status Fragment :

In the Checking Status Fragment , the User has to enter the order number of him and the password that given in the OD Application form to check the status of the Application . If the details entered by the user is invalid it shows a error message . The details of OD Application form is invalid the admin will reject that Application and shows the message "Your Application has been Rejected." in Checking Status Fragment . If the verification by admin is successfully done, then the Application is forward for the certificates section to pack the certificates of particular person and to Courier Office .

Screenshots :

Help Desk Fragment :

    It contains the basic doubts that a Applicant gets during appling for the certificates . The doubts and the answers are given in this fragment and a additional field is present that enables the applicant to contact us. That field is Contact Us Field , the applicant can send this mobile number to the clarify there doubts . The helping team will call them for there doubts clarification .

Screenshots :
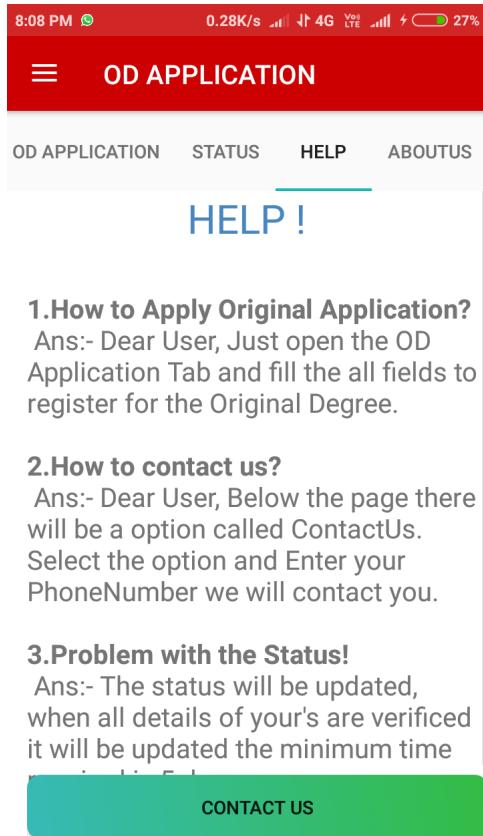
-> The Help Desk Fragment contains a Contact us Activity.

<u>Contact Us Activity</u> :

The ContactUs Activity contains a phonenumber field that enables the user to send this phonenumber to the helping team of the OD Application. The helping team calls the user, for the clarification of the user doubts.

<u>Screenshots</u> :
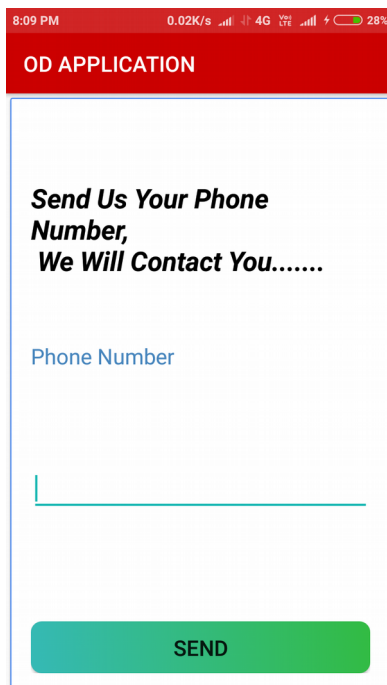
Credits Fragment :

        Credits Fragment contains the reference and developers names and there contribution to the development of this Mobile App.

Screenshots :

UniTesting :
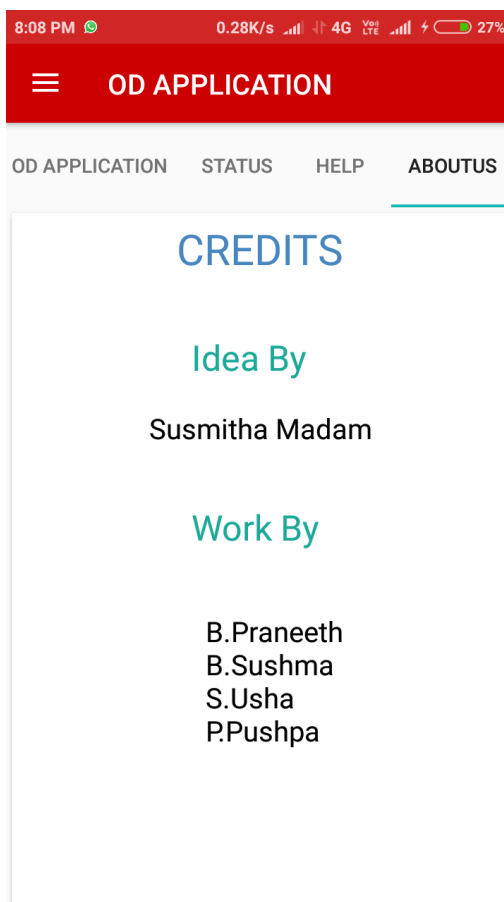
       In Unit Testing each independent unit is tested separately, by isolating it from the remainder of the code to ensure paprts of the code are working properly, Unit is the smallest testable part of the code, as in here the classes are treated as base unit. Since the base application in was threading concept , it is possible to leverage the j Unit for testing the individual components.

Unit Testing (OD Application)			
	Test Modules	Test Case	Result
1	Activites	Check all the clickables & textviews	Pass
2	API Calls	Check whether API is called or not	Pass
3	JSON test	Check the JSON data to represent	Pass
4	GET method	Check get method is working or not	Pass
5	Firebase Connection	Checks whether the firebase connection is working or not	Pass
6	Upload Image	Check quality of image	Pass
7	Tabs	MainActivity tabs are in correct order	Pass
8	Order Status	Check order status	Pass
9	Processing Bar	Checks whether the processing is correcting properly or not	Pass
10	Payment	Check payment is perfectly assigned or not	Pass
11	Phone Number	Check the Phonenumber of the user	Pass
12	PC Number	Check the pc Number of the user	Pass
13	File Manager	Checks permission to save the Application Form to the internal storage	Pass
14	Authentication	OTP verification for the applying of the OD Form	Pass
15	Navigation Drawer	Checks whether the navigation drawer is working properly or not	Pass

Pre-Existence :

        The OD Application Software is developed by a student in JNTU Hyderabad . It is a Web Based Software and it took for him about 2 years to complete the project . It is realtime database based and it contains the a login method , a full detail Fields of the Applicant , to fill the form and the payment gateway after that the application is successfully registered . The Admin will check all the details that the applicant entered and then the verification is carriedout after that the ordered is processed forward.

Existing :

        we have done a Mobile Application . Now a days everyone using the smart phones , it makes easier for the applicants to apply there certificates from there mobile itself. We introduced more secuirty purposes in this , like OTP verification , Image uploading . It is based on cloud Architecture using Firebase . Firebase is an Google Server . Introcuded in 2012 April 12 . It contains some more extra features then the Pre Existence Software . The main features are it is otp verification, uploading image of the applicant . While in the process of the applying the OD , the back button will not work , if the application is closed the content entered is removed then the application is not considered . If the Application is applied successfully then the application status is updated . We can check it in the status fragment .

Conclusion :

        The application has been designed, implemented and tested with real devices with users successfully. The project helped in understanding the challenges involved in developing an android application for android mobiles and different type revoulation mobiles, the ways to overcome the and in better understanding the value of designing the components of overall applications before implementing them.The project has also taught me android application development programming skills and refining design and implementation the logic of software and every phase and improve the performance of overall application

Reference :

        Youtube, Google, Github, Tutorial Points, JNTU Website .