# Software Requirements Specification

**for**

# vCOMPLAIN - Online Complaint Registration and Management system


**Prepared by**

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# 1 Introduction

A complaint arises a discontent or dispute at any level in any organization. If the organization is an academic institution, then this issue becomes more sensitive and important. Students are the most vulnerable entities at educational institutions often fail to express and sometimes fail to seek proper support for the issues they face arising at numerous levels. Online complaint Registration system is an online platform to receive and act on complaints reported by students of private or public institutions, enabling prompt actions on any issue raised by them and to avail services more effectively. Also, the smart web portal for complaint processing connects students and action-takers directly through an online platform.

## Document Purpose

The purpose of the Software Requirements Specification is to describe the specific requirements of the Complaint grievance retrieval system implemented with help of android studio and firebase. Included with the description of the requirements is a description of any constraints or assumptions that the project is working within. Along with the requirements descriptions, it is also the purpose of this document to describe any performance requirements that need to be met. If there are any standards that need to be considered when developing the software are also listed. Lastly, the purpose of this document is to communicate the system attributes of the Complaint Registration and Management System. These system attributes include speed, dependency, efficiency, good performance.

## Product Scope

The objective of the complaints management system is to make complaints easier to coordinate, monitor, track and resolve, and to provide the company and institute with an effective tool to identify and target problem areas. Also to monitor complaints handling performance and make business improvements and working in a workplace smoothly. Therefore Online Complaint Management is a management technique for assessing, analyzing and responding to customer complaints. Complaints management software is used to record resolve and respond to customer complaints, requests as well as facilitate any other feedback. It's an online platform to receive and act on complaints reported by students of private or public institutions, enabling prompt actions on any issue raised by them and to avail services more effectively.

## Intended Audience and Document Overview

This Software Requirement Specification Document is intended for developers, professors, users, testers and documentation writers to have a clear understanding of this Software engineering project. The document is arranged in an easy to grasp manner with a detailed description of the various steps and procedures involved while working on this project. It begins with giving an overview of the project and covers all the specific requirements.

## Definitions, Acronyms and Abbreviations

**API:** It is the acronym for Application Programming Interface, which is a software intermediary that allows two applications to talk to each other.

**CDMA**: It is the acronym for Code-division multiple access, which is a channel access method used by various radio communication technologies. CDMA is an example of multiple access, where several transmitters can send information simultaneously over a single communication channel. This allows several users to share a band of frequencies

**FDM:** It is the acronym for **Frequency-division multiplexing** (**FDM**), which is a technique by which the total bandwidth available in a communication medium is divided into a series of non-overlapping frequency bands, each of which is used to carry a separate signal. This allows a single transmission medium such as a cable or optical fiber to be shared by multiple independent signals. Another use is to carry separate serial bits or segments of a higher rate signal in parallel.

**FTP:** File Transfer Protocol is a standard communication protocol used for the transfer of computer files from a server to a client on a computer network. FTP is built on a client-server model architecture using separate control and data connections between the client and the server.

**GUI:** The Graphical User Interface is a form of user interface that allows users to interact with electronic devices through graphical icons and audio indicator such as primary notation, instead of text-based user interfaces, typed command labels or text navigation

**HTTPS:** Hypertext Transfer Protocol Secure is an extension of the Hypertext Transfer Protocol. It is used for secure communication over a computer network, and is widely used on the Internet.

**OS:** An operating system is system software that manages computer hardware, software resources, and provides common services for computer programs.

**RAM:** Random-access memory is a form of computer memory that can be read and changed in any order, typically used to store working data and machine code.

**TDM:** Time-division multiplexing is a method of transmitting and receiving independent signals over a common signal path by means of synchronized switches at each end of the transmission line so that each signal appears on the line only a fraction of time in an alternating pattern.

**UI:** It is the acronym for User Interface. In the industrial design field of human-computer interaction, a user interface is the space where interactions between humans and machines occur.

**UMLS:** The Unified Modeling Language is a general-purpose, developmental, modeling language in the field of software engineering that is intended to provide a standard way to visualize the design of a system.

**VIT:** It is an acronym for Vellore Institute of Technology, which is an Institute of Eminence (IoE) and a private deemed University.

## Document Conventions

This document follows the IEEE formatting requirements. It is formatted with Arial font size 12 throughout the document for text and uses italics for comments. The Document text is single spaced and maintains the 1" margins found in this template.

- **https://www.nmcnagpur.gov.in/**

This is the Official website of NMC, this website provides different information about the city, department, services, and news. From this website we are getting the idea of different departments in the NMC and how the complaints related to the respective departments are forwarded to that department. The website consists of much detailed information. It consists of various departments like Water, sewage, tax and property, slum, social welfare, education etc. This website also consists of detailed information about NMC. This website also provides details about the ongoing projects. On this website we can see the complaint lodging process and complaint lodging form which will be useful for working in the proposed system. As the proposed system is based on municipal corporation this site is useful for getting the details of departments list.

- **http://www.gunturcorporation.org/**

This site provides a basic idea to register a complaint and also to check the complaint status whether the complaint is solved or not. On the website users can lodge a complaint online. Users can submit their complaints and provide contact details such as address, email-id. The website shows the procedure for lodging complaints and its further process.

- **http://www.consumercomplaint.in/**

This website is useful for the consumer to file their complaints online. A complaint message is assumed by consumercomplaint.in to be a description of a situation experienced by a consumer. A complaint is only a personal opinion by a consumer, a perception of a consumer. That personal perception and/or opinion based on their own personal experience can be powerful, or meaningless, in the opinion of ConsumerComplaints.in, depending upon the context and content of what is written. We're not responsible for the way that information is interpreted by whoever reads it, which of course varies from person to person, depending on whom they are, their own personal experiences, biases, opinions, etc.

**Research papers :-**

- **Complaint go: an online complaint registration system using web services and android:**

  This paper is mainly focused on user functionality and user interface for online complaint management systems. It also describes functions of android management in software development aspects.Also it defines camera module integration with android application development.

  This paper is related to municipal corporation so sensors module is also included in this.

**Summary :-**
In numerous nations, there are city bodies that are the nearby representing bodies that help keep up and run urban communities. These administering bodies are for the most part called MC (Municipal Cooperation) The MC may need to introduce edit cameras and other observation gadgets to guarantee the city is running easily and productively. It is imperative for an MC to know the deficiencies occurring inside the city. As of now, this must be for all intents and purposes conceivable by introducing sensors/cameras and so forth or enabling nationals to straightforwardly address them .

**Reference link :-**
https://www.researchgate.net/publication/321479787_Complaint_go_an_online_complaint_registration_system_using_web_services_and_android

- **Application of Firebase in Android App Development-A Study :**

  This paper describes the functionality of firebase with android application.Thus this paper is really important in our project. This paper also describes user testing aspects of firebase integration within android software.

**Summary :-**
Firebase is considered a web application platform. It stores data in JavaScript Object Notation (JOD) format which doesn't use queries for inserting, updating, deleting or adding data to it. It is the backend of a system that is used as a database for storing data. It helps developers" builds high-quality apps. It stores the data in JavaScript. Object Notation is in the form of JavaScript Object. Notation format .

**Reference link :-**
https://www.researchgate.net/publication/325791990_Application_of_Firebase_in_Andriod_App_Development-A_Study

**Framework references :-**

1. **Firebase :-**
   Firebase provides different kinds of functionalism to our software project.Firebase main usage is authentication with Google and also it provides separate storage for user verification data.
   Also we are using firebase as a real time cloud database for storage of all complaints.
   - Firebase documentation:
     https://firebase.google.com/docs/build

2. **Android studio:-**
   Android studio is platform for android software(application)

development . It provides an interface to create any android software from scratch. It helps to create the main design of software also.It provides multiple language support (like Java and Kotlin).
Also it is open source IDE (Integrated Development Environment) where we can create personalized software.
It also provides particular API references with libraries for development.

- Android studio documentation:
  https://developer.android.com/docs

# 2 Overall Description

## 2.1 Product Perspective

This product is based on the context of a mobile application for complaint registration. It originates from the required utility for such an application especially in VIT - the scenario is that students face so many problems which they need to complain about to some authority, but usually they don't get the time, or don't want to go through the detailed process.
No, the product is not a follow-on member of any other product family.
It is also not practically a replacement for certain existing systems, or a new, self-contained product because of it's novel approach.
The 'vComplain' Mobile Application is an independent application and a self-contained product. The system interfaces, user interfaces and hardware interfaces related with this software are defined as in the 'Specific Requirements' section.

## 2.2 Product Functionality

1. Students (primary users) should be able to register complaints in the portal.
2. When the student tries to log in, the server/administrator will verify the password, whether it's correct or not.
3. Page displays all complaints, which the user has registered.
4. Each complaint has its unique complaint id.
5. Students can register complaints via email or mobile no.
6. Students can view all the complaints they sent, but once submitted, they cannot delete it.
7. Students can track complaint status as well.
8. Administrators can check whether any student has submitted a complaint or not.
9. Administrators can delete any complaints and they can block any user from filing complaints.

## 2.3 Users and Characteristics

PRIMARY ACTOR - Student

We anticipate that this product will be ideal for students and therefore our target users are 'Students' willing to submit complaints for enquiry using the vComplain portal.
There is no security/privilege level attached and all Students are treated as equal.
These students must however belong under one college/organisation to be eligible to use the application provided as a service for registering complaints.
Any student from another college, wouldn't be able to log in or create an account without proper college credentials let alone a person impersonating a student.

SECONDARY ACTORS - Administrators/HoD/Dean/Dept. Head

The secondary actors/users are the ones who respond to the initiation of use cases by Primary Actors (in our case: Students)
The Administrators and the College Department Heads are the best fit here, as they have a suitable level of privilege and access.

## 2.4 Operating Environment

The environment in which the software will operate is mostly Android OS.
The hardware platform is a generic one with some minimum requirements for the smartphone as we would like to cover a broad range of hardware interoperability - 2GB RAM Android OS version - 8 onwards.

## 2.5 Design and Implementation Constraints

Hardware Limitations:
The minimum hardware requirement for the smartphone is 2 GB of RAM and a touchscreen panel and Android OS 8.0 onwards

Software Limitations:
These are some problems that could be faced by development team during the project

1. Insufficient Transport Layer Protection
2. Client Side Injection:
3. Wrong Session Handling
4. Malware

System Limitations:

1. System has to be on an android device.
2. Or the users must use an android emulator on another device.

Others Constraints:
The application should be built using Android Studio platform for Mobile Application Development, and it should, initially, be accessible through some demonstration or prototyping tool and later published on a server or hosting space.

Google Firebase is a specific technology that we are using here. With real-time database and cloud storage functionality Google Firebase has a facility of crash reporting to fix bugs quickly and it's 'Firebase Authentication' saves time on developing Web Service methods for authentication.

Also, with Firebase authentication, one can also get good analytics and demographic information of users.

Also for testing purposes the Project team would require an Android device (Android mobile) which supports Firebase APIs or Android Emulator (software).

Recommended OS for Firebase is Windows 10.

Design Constraints:
Android Studio also has an inbuilt design tool to develop the User Interface (UI) for the Mobile Application.

Communication Protocols:
FDM (Frequency Division Multiplexing)

TDM (Time Division Multiplexing)
CDMA (Code Division Multiplexing)

### 2.6 User Documentation

Documentation is a vital part of a project. From proper formatting of all information, to a detailed report to present to the finance/management team or the Head of the Project, Documentation also includes
user manuals, on-line help, and tutorials that will be delivered along with the mobile application.
We have used IEEE documentations format under the guidance of our faculty for this Software Requirements Specification(SRS) Report.

### 2.7 Assumptions and Dependencies

Our project includes some assumptions and dependencies.

- We assume that all users are going to verify their account through email only.
- Also we assume all data of users' information divide into two databases mainly to store user information and storage of complaints separately
- Our project is mainly dependent on android API and Firebase connectivity.
- Apart from this our project is not having any other assumptions.
- The dependencies presently involved with our project are simple and straightforward as it would be in a waterfall model.
- Our GANTT chart is a good illustration of how different parts/phases of the project are dependent on each other due to some existing task/subtask directly influencing its consequent task.

## 3 Specific Requirements

### 3.1 External Interface Requirements

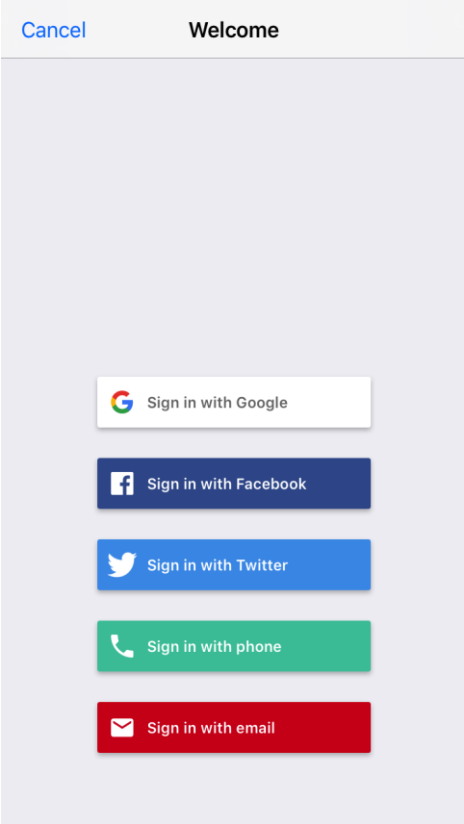
#### 3.1.1 User Interfaces

1. Login page and signup page.
2. Home page of students where students can see their complaints.
3. Sorting of the complaints based on the date or number of supports.
4. Password changing option.
5. Upload the page to post their complaints.

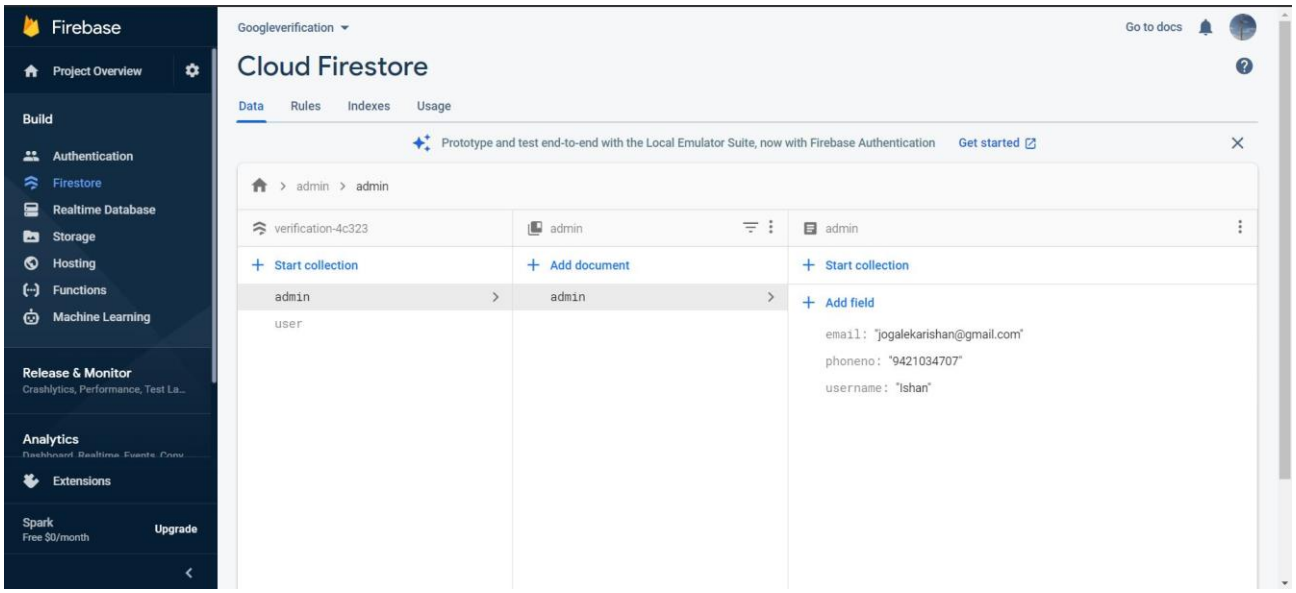
Student first signup using google authentication. Firebase console will help in this for designing. After that users can view all pages. Sorting of complaints depends on data and no of support. Also sorting is done in a real time database.

GUI Interface :-

1.Login and signup page-




2. Firebase cloud-




### 3.1.2 Hardware Interfaces

1. Any android device prefered to use the latest with Android API version 9 or 10.

2. Laptop or Desktop to handle databases for administrator purposes.

3. Our product requires only one hardware which is the camera of the phone.

As we are developing an android platform for our problem statement , we require the Firebase authentication console for development for this Android 10 or 9 is used.
Handling cloud and database PC is required.

### 3.1.3 Software Interfaces

1. For the implementation of product software, requirements are android studio and firebase database(cloud firestore).

2. For users, the software requirement is an android mobile phone.

3.Operating System: Windows 10.

### 3.1.4 Communications Interfaces

1. Our product will use the same interface within the application to communicate with administrators.So this will communicate through database only.

2. We will try to integrate our product with email services mainly using SMTP protocol.

3. Photos of complaints ( as example VTOP service is not working) will use FTP to store & communicate to the database.

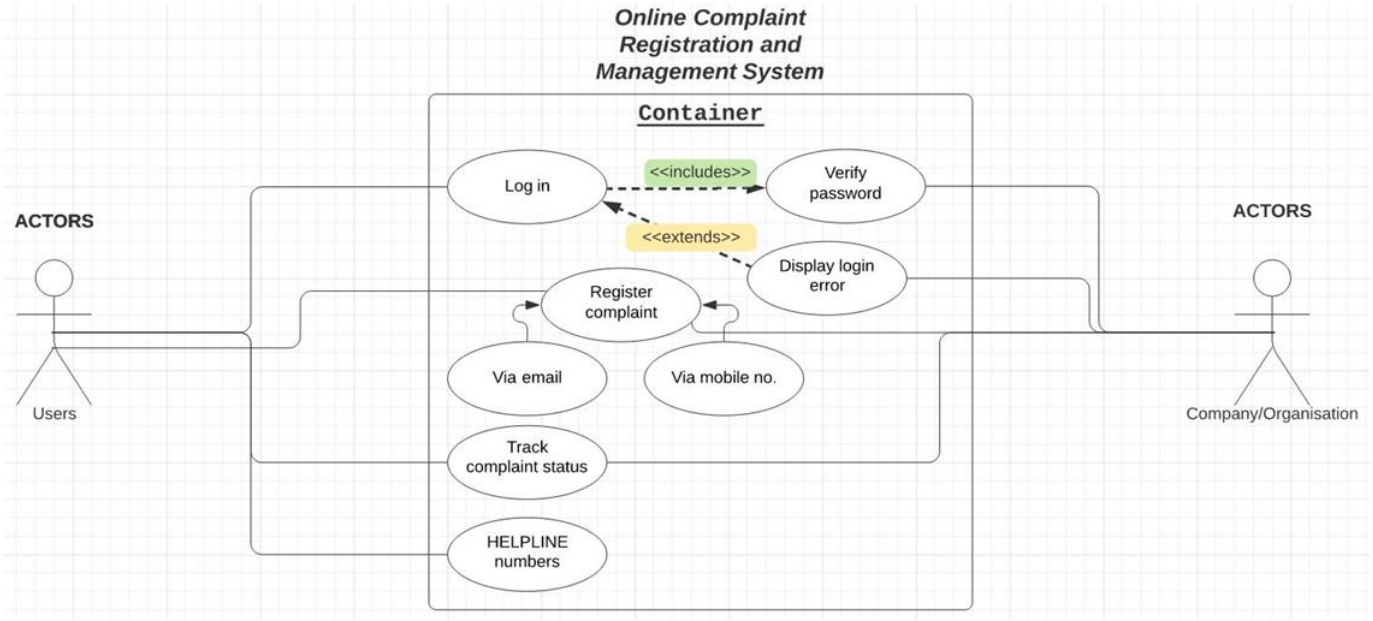
### 3.2 Functional Requirements

- The users can sign up and create an account, the authentication of department staff is provided by administrators. There will be a unique ID for each user.
- This page displays all complaints which are in public mode, each complaint has its unique complaint id. The users can sort it by time or support.
- The users can support any public complaint by selecting support option
- Users can file a complaint and send it to any department. They can file complaints in public or private mode.
- Users can also send an image of their complaint.
- Users can view all the complaints they sent, they can delete complaint, edit its privacy
- Administrators can delete any complaints, they can ban any user from filing complaint, they can send reply on complaint
- Department staff can view the complaints sent to their respective department.
- Administrators can delete any complaints if they want.
- Administrators can block the users who send complaints
- Department staff can send request to administrator like request to delete a complaint or send reply to a complaint

## 3.3 Behaviour Requirements

### 3.3.1 Use Case View

- There are two actors in our product Users (students, faculty,VIT staff) and company / organization (administrator).
- Users can use this application and admins are going to control databases and all other functionalities within the app.
- Users / Students can login using email for authentication purpose.This data will be stored in the Firestore database.
- Using the application we will verify the user using a password.
- Users can view helpline numbers also for emergency services.
- If there is redundancy while login error will be displayed.
- Users can register complaints using email or mobile phone.
- Users can choose display functionality as public or anonymous.
- Admins will check errors using the database through application and solve particular errors.
- The priority of errors will depend on no of support and date.
- Users can track complaint status also.




## 4 Other Non-functional Requirements

### 4.1 Performance Requirements

- For better performance better network quality is required.
- Also for uploading data in the database there should be enough data capacity.
- For real time cloud network quality should be better.
- Android system requirements (API 29 and API 30 required) are also important.
- For development purposes Android studio required more memory requirements.
- Firestore database hold less redundancy so repetitive error may cause some errors , to rectify this issue there is a limit to upload complaints.

### 4.2 Safety and Security Requirements

- Firebase will provide user authentication services.It will use Google authentication.
- There is a unique Id for each user in the database so it will act as the primary key in the database , so there will be no security issues while log in and using our project.

- Access to the database is only valid for administrator account.So this will provide data security.

- Our project requires google authentication service enabled by user device for log in to application .

- Firestore UI will provide an interface for it.

- Firebase will access users IP addresses also so it will provide privacy in cloud messaging and cloud storage.

- Data is encrypted through firebase and transit through HTTPS protocol.

### 4.3 Software Quality Attributes

- Firebase will provide a robust database for our project but there will be some redundancies uploading complaints photos on large scale.

- To avoid such errors we will try to implement database constraints to remove repeated data.

- For maintaining software quality our project will remove old data from the database eventually but records as logs will be present in the database.

- For testing our project , we are mainly focused on functionality so we will do Functionality testing and usage testing also.

- To avoid redundancies in databases we will restrict users also.

- Uploading photos of complaints is completely dependent on the camera module on the phone so there may be some issues with quality of images.

- As we are also providing storage for images software design may be complicated.

## 5 Other Requirements

- Android app development needed some JAVA libraries that will be included in Android studio.
- For administration purposes our project requires initial details like email and username to assign admin roles in databases.
- To design different UMLs and Diagrams some tools are also required initially.
- For development of the frontend (UI) of our application also requires external tools.
- Initially some random data is also required for testing purposes.

## Appendix A – Data Dictionary

1. API :-

   It is known as the Application Program . These are basically web based libraries. We are using an API for Android development in our project.

2. Android :-

   It is a mobile device operating system. Our project is mainly focused on this development.

3. FTP :-

It is a File Transfer Protocol for the internet. As our project also includes uploading images this process will use this protocol.

4. HTTPS:-

It is a protocol for cloud and real time database.It is a hypertext transfer protocol with security as an extension.

5. Firebase:-

It is a real time database and cloud providing system for software development. Also it provides google authentication services.

6. Real time database :-

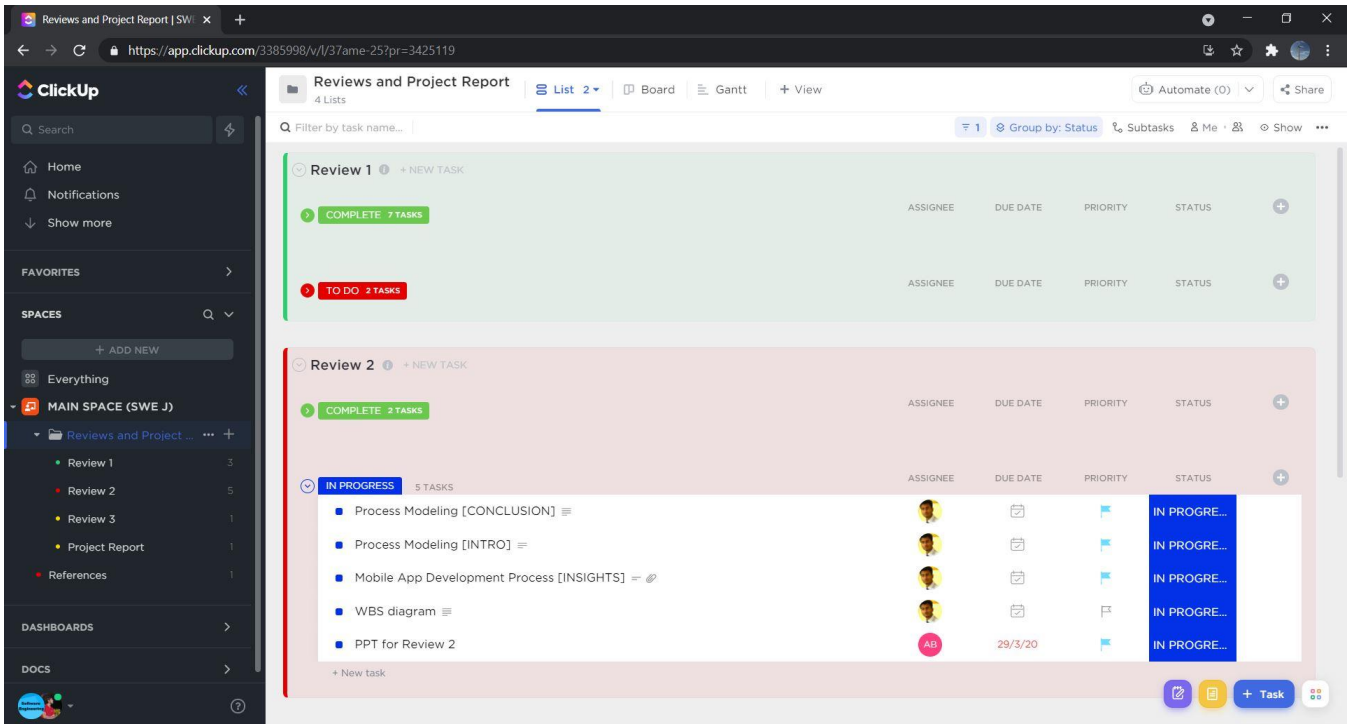
   It gives real time data integration with software and database.This will reduce errors in the database.


## Appendix B - Group Log

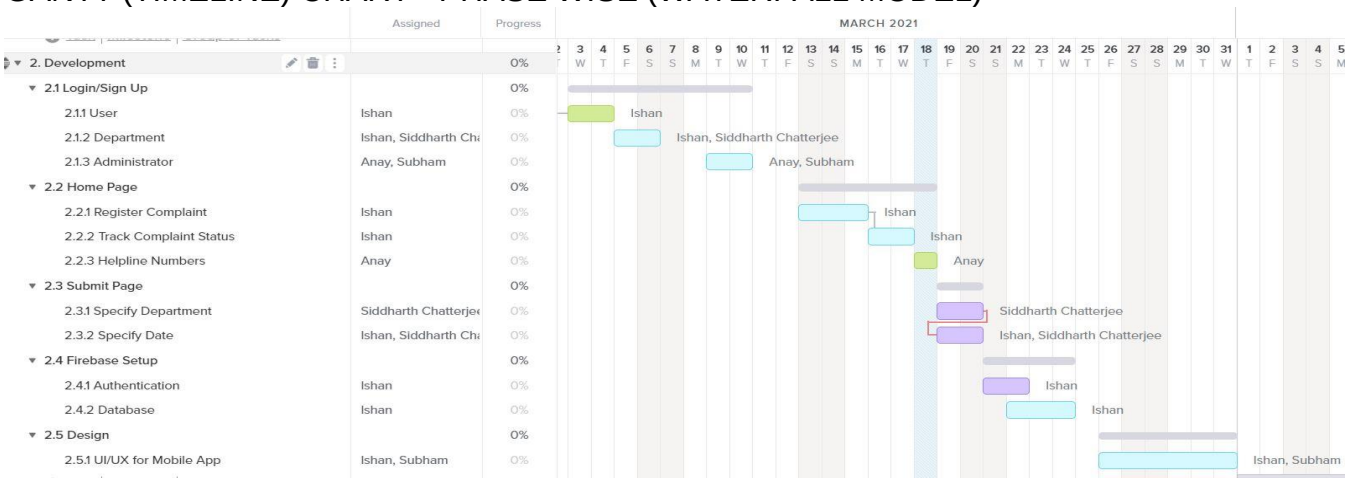
**Project management tool :-**

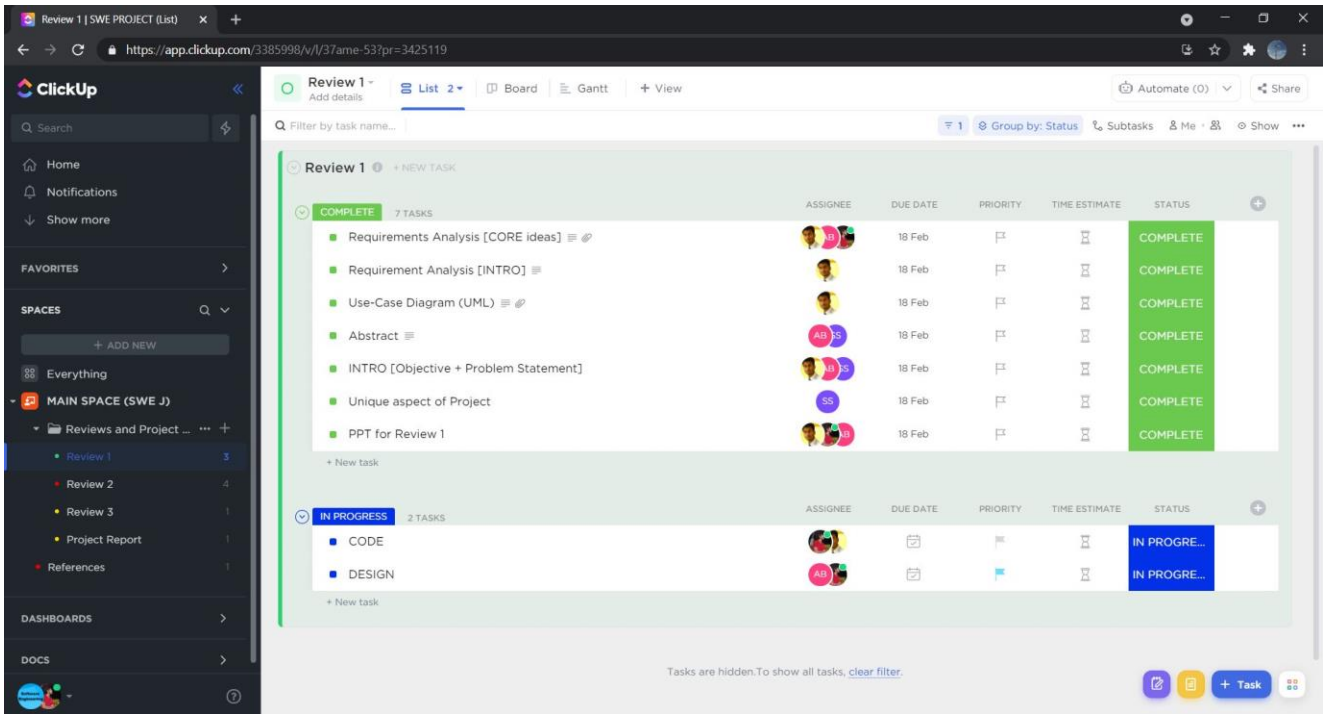
We are using the online project management platform “ClickUp”. This platform is very helpful for project compilation tracking, time tracking and assigning new tasks.
ClickUp is an independent platform for project management.This tool is also having a clean interface to interact with it. Also it is easy to use.
So we chose this platform as our project management and tracking tool.

- **Following images are related to our project management**




GANTT (TIMELINE) CHART - PHASE WISE (WATERFALL MODEL)

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ClickUp
Review 1
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Share
Filter by task name...
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MAIN SPACE (SWE J)
Reviews and Project ...
Review 1
Review 2
Review 3
Project Report
References
DASHBOARDS
DOCS
+ NEW TASK
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PRIORITY
TIME ESTIMATE
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Requirements Analysis [CORE ideas]
Requirement Analysis [INTRO]
Use-Case Diagram (UML)
Abstract
INTRO [Objective + Problem Statement]
Unique aspect of Project
PPT for Review 1
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COMPLETE
+ New task
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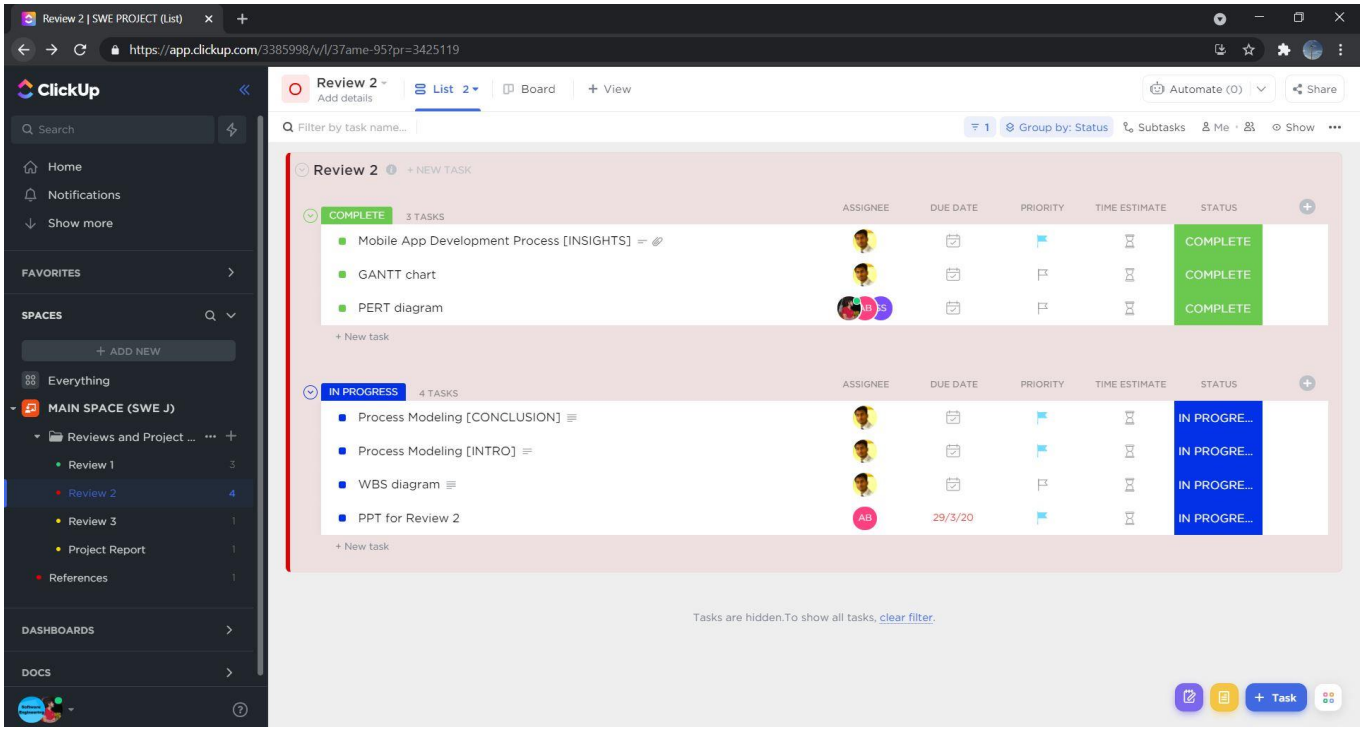
Review 2 | SWE PROJECT (List)
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Review 2
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Share
Filter by task name...
Group by: Status
Subtasks
Show
Home
Notifications
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Reviews and Project ...
Review 1
Review 2
Review 3
Project Report
References
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TIME ESTIMATE
STATUS
Mobile App Development Process [INSIGHTS]
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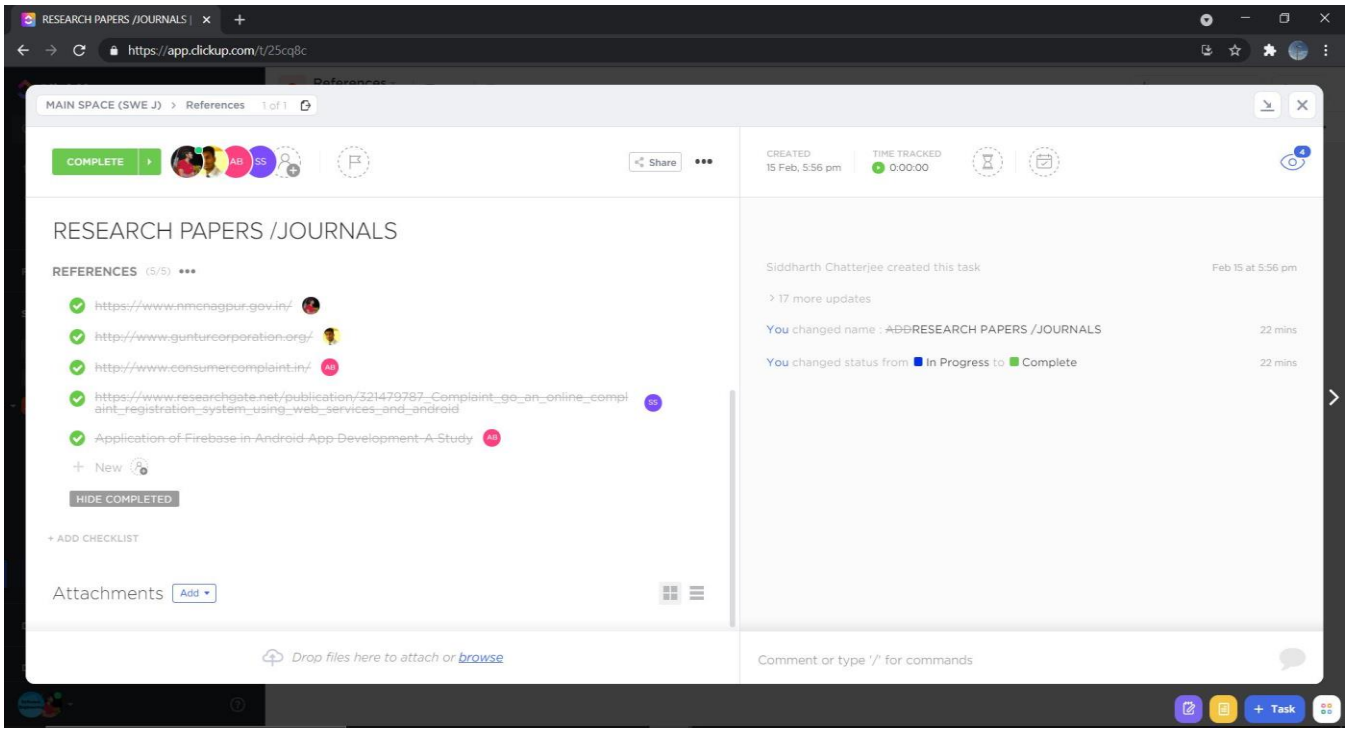
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http://www.consumercomplaint.in/
https://www.researchgate.net/publication/321479787_Complaint_go_an_online_complaint_registration_system_using_web_services_and_android
Application of Firebase in Android App Development-A Study
New
HIDE COMPLETED
+ ADD CHECKLIST
Attachments
Add
Drop files here to attach or browse
Siddharth Chatterjee created this task
Feb 15 at 5:56 pm
› 17 more updates
You changed name : ADDRESEARCH PAPERS /JOURNALS
22 mins
You changed status from In Progress to Complete
22 mins
Comment or type '/' for commands
+ Task