SMART ELECTRONICS BUYING GUIDE SYSTEM

BY

GAZI MONIRUL ISLAM
ID: 151-15-4716

NASIRUL ISLAM ROKI
ID: 153-15-6494

This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

Supervised By

Md. Jueal Mia
Lecturer
Department of CSE
Daffodil International University

Co-Supervised By

Shaon Bhatta Shuvo
Senior Lecturer
Department of CSE
Daffodil International University

DAFFODIL INTERNATIONAL UNIVERSITY
DHAKA, BANGLADESH
September 2019

APPROVAL

This Project/internship titled **"Smart Electronics Buying Guide System"**, submitted by Nasirul Islam Roki, ID No: 153-15-6494 to the Department of Computer Science and Engineering, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Engineering and approved as to its style and contents. The presentation has been held on 13 September, 2019.

BOARD OF EXAMINERS

Dr. Syed Akhter Hossain — **Chairman**
Professor and Head
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Narayan Ranjan Chakraborty — **Internal Examiner**
Assistant Professor
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

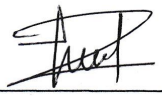
Shaon Bhatta Shuvo — **Internal Examiner**
Senior Lecturer
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Daffodil International University

Dr. Md. Saddam Hossain — **External Examiner**
Assistant Professor
Department of Computer Science and Engineering
United International University

DECLARATION

I hereby declare that, this project has been done by **GAZI MONIRUL ISLAM** (151-15-4716) and **NASIRUL ISLAM ROCKEY** (153-15-6494) under the supervision of **Mr. Md. Jueal Mia, lecturer, Department of CSE** in Daffodil International University. I also declare that neither this project nor any of this project has been submitted elsewhere for award to any degree or diploma.

Supervised by:



Mr. Md. Jueal Mia
Lecturer
Department of CSE
Daffodil International University

Submitted by:

Gazi Monirul Islam

Gazi Monirul Islam
ID: 151-15-4716
Department of CSE
Daffodil International University

Nasirul Islam Rocky

Nasirul Islam Rocky
ID: 153-15-6494
Department of CSE
Daffodil International University

ACKNOWLEDGEMENT

First we express our heartiest thanks and gratefulness to almighty God for his divine blessing Upon us and also my beloved parents, teachers, friends support help us to make us possible to complete our final year project successfully.

We really feel grateful and wish our indebtedness to **Mr. Md. Jueal Mia, lecturer,** Department of CSE Daffodil International University, Dhaka. Deep knowledge & keen interest of our supervisor in the field of Android based Smart buying guide app to carry out this project. His endless patience, scholarly guidance, continual encouragements, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stage have made it possible to complete this project successful.

We would like to express our heartiest appreciation to **Mr. Abdus Satter** Assistant Professor**, Mr. Fahad Faisal** Assistant Professor, **Mr. Aniruddha Rakshit** Lecturer, Department of CSE, Daffodil International University, Dhaka and for his kind help to finish my project and also to other faculty member and the staff of CSE department of Daffodil International University.

We would like to praising our entire course mate in Daffodil International University, who took part in this discuss while completing the course work.

Finally, I must acknowledge with due respect the constant support and patients of my parents.

ABSTRACT

Our project title “Smart Electronics Buying Guide System” which is build based on android application for global and also our country people who buy electronics products and get the most value from what they are buying and get most satisfaction from it. There are many things can happen if they don’t know what things to look for? **What purpose they are buying? Are they getting it from authentic website or not? How much they know about the technology of that particular electric product?** (Smartphone, Laptop, PC, Tv) and so on. We have lots of e-commerce website that offer different types of electronics product so that people can buy it from online.

Our project is the complete guide to those people who wants to know the technology of that product, get the most accurate and authentic websites sources to know better about that product, get latest feedback expert recommendation video and our personal video to guide those people and most importantly let them know what is good for them and help finding the best electronics product at their budget and know the original and duplicate of that particular product so that they know and aware of all faults.

TABLE OF CONTENTS

LIST OF FIGURES

FIGURES **PAGE NO**

LIST OF TABLES

CHAPTER 1
INTRODUCTION

1.1 Introduction

Today every single people use smartphone, tv, laptop, desktop and lots of electronics product in the modern globe. They have to buy them from different offline and online stores (like Amazon) and related e-commerce Websites. But Most of them don't try to understand **What Purpose they should buy it? What features they Should look for? What is their requirement? What is the best use of spending money on it? Are they buying it from authentic source? What is best for that price point?** And most importantly how they know about original or duplicate product and it is very common is electronics category. In our project we tried our level best to solve all those problems in an organized way possible giving you the Option to see related authentic and trustable website to look into then and view their website from our **''Smart Buying Guide app"** and we have different sections and services based on the it like getting best websites which are already present and expert video reviews, our own videos that we publish on YouTube to guide you in real-time, our personal blog post where we tell you about how to choose original product and identify duplicate and clone stuff, and user can contribute by posting what they buy in our app blog post and help community to grow by building the best Smart Electronics buying community for modern world.

1.2 Motivation

Our motivation is the only factor that help us building this application to come true. If we don't have exact goal for which purpose we are making this project is the key factor here:

- First of all, people around us help us to motivate to build it.
- Make something that help our huge community to choose best things.

- My own personal interest in making in making an app that will help to grow my skills, ability, useful software building quality and much more.

- To learn about android programming and my career development and how to work with APIs in general.

- Seeing Many people suffer and hearing their frustration I really get into the process in order to make them happy, self-dependable, acknowledgement of technology.

1.3 Objectives

We want to make a complete service that is based on electronics product (Smartphone, Tv, Laptop, Desktop) that is only targeted at consumer good which is our main priority. Giving then the way to navigate different authentic websites in a swipe with very organized way possible. Technology section will help them know about related product features, technology, buying recommendation etc. and our duplicate vs original section help them identify the factors to be an original product. Video section help them by watching lots of expert videos (YouTube API based) and our own videos to guide them about latest feeds and technology of different components. Let's see them in detail:

- Navigate through authentic websites in just finger swipe and get information about you desired product you want to buy.

- Let people know about latest technology of related products.

- Decrease the tension and frustration by choosing the best product by yourself and help others to recommend by posting blogs to let others user see it.

- Get to know about original vs duplicate product.

- Ensuring continues video support by experts and us in general that helps a lot when you see product in video you get better idea about it.

- Build a sound community that help each other by sharing, commenting and recommending.

1.4 Expected Outcome

Our main expected outcome would be for consumers and buyer who like to know about authentic websites and amazing navigation through them and get to know about the technology they have to know before buying it and get the best recommendation for what they should choose and share it to others by posting about it and help building sound and buying guide community. Some of the main expected outcomes are given below:

- Buyer's own satisfaction and gaining knowledge.
- Ensuring authentic product selection.
- Consumer know what they are buying for which purpose.
- Enable a consumer to share what they bought and share among community to help others.
- Know about quality websites and choose product smartly by their own.
- Ensuring a community free of duplicate and clone products.

1.5 Report Layout

In our project report we organized our contents in chapters such as in chapter 2 we discuss the background of our application and how we plan it and why we choose this application. In chapter 3 we discuss the requirement specification for our project. Here requirement and implementation are presented briefly. In chapter 4 system design and how the system is designed like front-end, backend design. Chapter 5 is based on the implementation and testing of our application for bug, validation and error testing. Chapter 6 is our final chapter where we discussed about future scope and conclusions of our application

CHAPTER 2
BACKGROUND

2.1 Introduction

With the revolution of modern era people are now so focused on many smart electronics products to be bought by them in order to make their life easier, smarter and tension free, with the advancement of internet it is getting more important to buy a smartphone, laptop, desktop and tv like basic electronics product. But they many times buy it from fraud websites and even they don't have any knowledge how they understand about that product features and specification properly. They are not sincere about what they should buy? What is the best choice? What will be more budget friendly? How to analyze all features that they need? What will give them proper satisfaction at right price point? How authentic are they? Balancing the need and money and authentication and knowing the technologies and reviews are very important before buying products. In our android based application "Smart electronics buying guide" system we make complete journey for any buyer like visiting good websites of each brand and getting video reviews from experts, amazing blogs of technologies and part by part analyze and recommendation we organized our application to help users in every way possible.

2.2 Related Works

Before we implement our application, we make sure that we do some search on various buying guide related topics like consumer's taste, choice, what they want in an application and how to help them in an effective way so that they get the most benefit from our application. There are some great e-commerce website that provides nearly accurate product related information and all features, specification, proper recommendation, verified customer's review like **Amazon**, **CNet**, **Epinion.com** provides review and recommendation for users and consumers.

Epinion.com give advice combining the voice of people with deep understanding of market trends and give recommendation on it. It offers product rating, buying tips, price information [6]

Amazon has become a common source of information about products.[6] It investigates the reviewers with their buyer's database and level them as verified purchasers of merchandise that they are receiving are reliable.[1]

CNet is an American media website that publishes reviews, news, articles, blogs, buying guide on various products on different technology. [9]

Ratings and reviews are essential part for consumers as they search and shop online store.
97% of consumers checkout negative reviews before making a purchase [2]

According to John Falcone, a real review is typically more moderate in its praise [1]

2.3 Comparative Studies

There are not good electronics buying guidance app which fulfill users need but there are some good websites like Amazon, Cnet, Epinion, Tom's hardware etc. are designed consumer friendly way like adding reviews, ratings, buying guide tips, analyzing on latest technologies on various electronics products.

The convenience of online shopping is an emerging trend among consumers [3]. Younger adults purchasing decision are influenced by consumer rating. Older adults are pat more attention on positive reviews [4]. Consumer behavior is the process consumer experience when making purchase [8]

Proliferation of web 2.0 technologies has triggered rapid development on online community [5]

Different people have different purchasing decisions. How you are going to find the best match and where will you find them and buy them then evaluate after purchase. People asks family, friends, neighbours about their experience with products. [6]. Trust should be a critical factor in an online context. Lack of trust is main reason for customers for not engaging in commercial transaction [7].

2.4 Scope of the Problem

In this section we will discuss about different types of problems users and admins can face while using or browsing our application. We will identify each problem and give related solutions based on those key problems and let's see what are those at a glance:

- How users will understand which product they should upload to our database?
- Why we are giving then limited amount of website to visit from our android app Websites section?
- How admin can send users the feedback and how users can send feedback to admins?
- Why are we giving buying guides on four products (Smartphone, Laptop, Desktop, Tv) and How authentic are those technological blogs and the information we provide?
- Why users can use our application in android smartphones only?
- How we know about which is best and recommended for most users?

The possible answers of the questions can arise scope of the problem sections are given below:

- We have a section in our app where users and admins can upload products information to database and users should only upload those products which they bought and they think that it is the best product in that price and satisfy most peoples need and help others in the community. Admins will upload products which are recommended to users and most authentic ones as well.

- As there are lots of websites that are only for marketing the products sell only so they only want to sell product without thinking about how good it will be for consumers and how authentic the information (features and specification) is compared to original product. They don't show the negative side of that product only should good sides which is bad for consumer as they deserve to know what is good and bad for them. So, we give them limited but good and authentic websites to check original product and know them better.

- Admin can send users push notification to users if some new blog post or new product is added or new good quality websites being added and this types of information will be provided and in the comment section users can comment on the product newsfeed and can put his own opinion and give message to admins and if any issues happen they can us at our personal g-mail from the app itself and let us know.

- We at this moment are offering support for four (PC, Laptop, Smartphone, Tv) products and the problem is we have fewer time then necessary to include more guidance for more products. We are focusing to give as much feedback as possible to those four important categories as they are essential part of our modern life now-a-days so giving proper guidance for those products is so useful for us all. We need time as we do research on them deeply and most important of all we care more about the authentic information provide part a lot.

- As android operating system is so popular and we want to connect most users and people all around the world using android smartphones and get most benefit for most of the consumers. We are still working on another web apps too that is related to this application and it will be coming into action soon. Then we can connect most of the people they can use smartphone service from any place and can use websites from desktop platform and laptop as well.

- We gather knowledge by watching videos of many famous youtuber and official launching presentation of any product and by researching many websites around the world and by doing so we gather valuable knowledge and provide them accurate and authentic information and buying guidance to them.

2.5 Challenges

There are lots of challenges in making and android based app that has huge database for user, admin, products and most important of all that deals with various types of websites and analyze product information of large number and give authentic information and proper guidance to consumers and that has lots of third party libraries and APIs (Application Programming Interface) used to parse information and videos from web URL and so on. There are some major challenges we have faced while designing and developing it like:

- Adding security features like fingerprint and proper login and registration.
- It is not possible for only admins to get latest product information and giving buying guide and recommendation alone so we have used blog post system where users can upload product related information and upload it.
- Users opinion is important so we have implemented comment system for each post in newsfeed and can check what other think about that product too.
- Videos are the best way to know about any product so we have implemented YouTube (API) based videos on out app with top quality channels videos and we also used our channel to provide latest feedback on every new topic.
- We have also tried to implement currency converted in our app as most of the product's price are in dollar ($) so we have to integrate converted to help consumers checking native price as well.
- We had to research a lot to get best websites and original information of any product and writing the static section to let them know about technology that they should know before buying offline as well.
- We have tried a lot to work on different libraries and APIs to integrate them on our app and make it powerful and useful.

CHAPTER 3
REQUIREMENT SPECIFICATION

3.1 Business Process Modeling

It is just a model that illustrates how an application works in different steps and it is the flow of various steps and how things are organized in any application. Not everyone is engineer or computer specialist, so to make other people understand as well as to model our project structure we make business model to see the steps and flow diagram and logics in just one diagram. It also teaches us how to design a project and help other understanding them.

Why we need a business process model?

- Shows us the steps of tasks.
- Understand logics and diagram
- Anybody can get an idea seeing business model
- It helps to define our workflow to other easily
- Ensure better management of process in the project

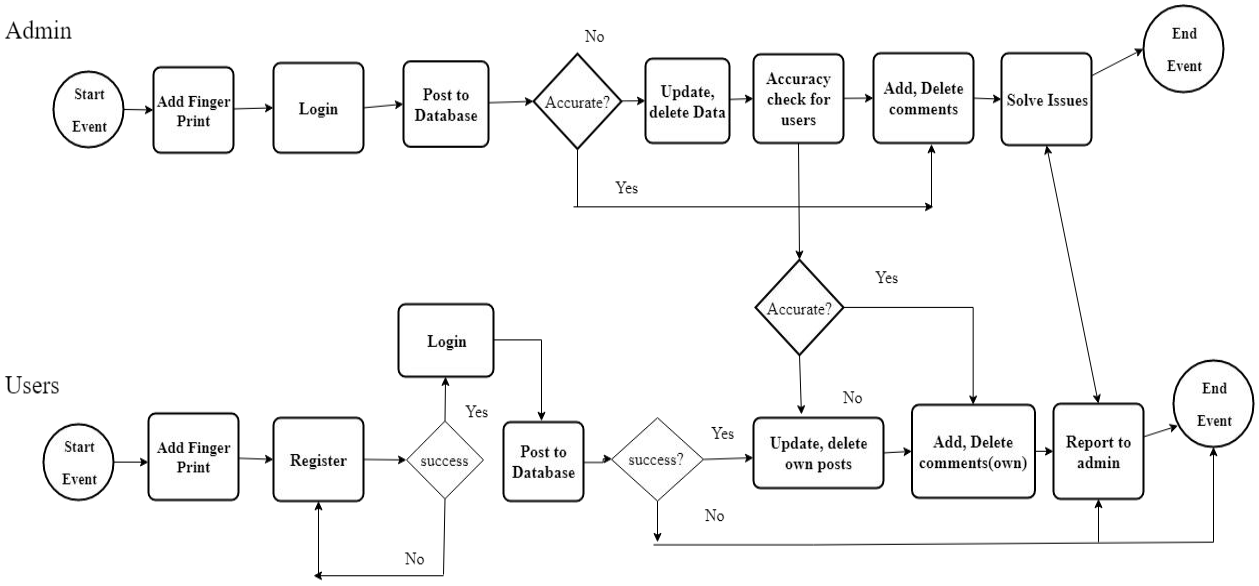


Figure 3.1: Business Process Modeling

Figure 3.1 Shows us the exact workflow and process of our application for admin and users and tasks are categorized and roles of each users is given with step by step process with logics and proper diagram. All the phases are:

- Authentication Phase
- Product Database for posts
- Update and error checking
- Adding comments for feedback
- Report to admin if something happens
- Solves issues for users (admin)

To implement proper business process model, we have organized flow of tasks in a chart to show how it will work. At first, we have authentication using fingerprint and firebase based login, registration then you can be a user to use all other features like adding posts, comments, modify and delete them if you want, you can scan QR code also for any products and in group chat section even with admins. Admin can further check the authenticity of your posted data and they can edit, delete them also. Users can contact to admin and report if any issues occur. Users can also communicate with admin real-time in group and send essential recommendation as well.

3.2 Requirement collection and analysis

Initial requirements

Initial requirements that must we need to function our system without that it's impossible to perform that. They are given below:

- We must have a database (Firestore) to hold posts data and manipulate it.
- We need to design layout (xml) and Java (language) to put our data to firebase firestore and storage to serve as backend of our application.
- We must have user authentication as only they can upload posts to database and keeping the records in case, we have to modify something if some problem occurs.
- Need proper validation of adding values in fields before upload.
- Advanced Firestore cloud database query system to parse proper data.

Admin requirements

Admin has tons of power in it and he has to maintain whole service so giving proper role to admin is very important is that case. Some roles are given below:

- Every time Biometric authentication and only one time for login.
- Upload Product Information with accurate data to database. (Firebase Firestore)
- Edit, delete, share Posts that he posted and for all user's post in general.
- Add, delete comments which is posted by users.
- Push Notification (Firebase based) to users when he uploads new stuffs.
- Solve consumers and product related issues

Consumers requirements:

In our buying guide system consumer has to contribute a lot to in making this application productive and useful as they are users so their feedback is necessary to grow our project.
Some roles of consumers are given below:

- They need android smartphone with finger print sensor support.
- They need to add fingerprint auth to enter into the system and register then login.
- They have upload blog posts about what they have bought and let others know about that product and give accurate information as much as possible.
- Add comments to posts and send email to admins if they have any issues regarding the application.
- Consumers can delete, edit his own posts but not others. They can add, delete comments as well by clicking on that particular post.

Software requirements:

- Java (Android Native Language)
- XML (Layout Design)
- Android Studio (Default Android code editor IDE)
- Github and git (Version controlling)
- Trello board (Project management)

Hardware requirements:

- Internet accessible android smartphone
- Phone Fingerprint sensor

3.3 Use case modeling and description

By using use case model. it becomes easy to describe any systems. Use case describe a discrete unit of interaction between a user (user can be either a human or machine) and the system. The use case given below where we try to define some methods to specify, identify and organize our system requirements that can facilitate a proper view of our entire system. It also specifies various kinds of user goal and their boundaries.

Why use case model in our application?

We use use-case model into our project report so that by viewing that a non-technical person can also get the idea what is going on and how the various functionalities of the systems works and interact with each other some key points are:

- Proper implementation of the project.
- Generate test cases.
- Defining specification of the system.
- Differentiate various user roles (Admin & Users)

Use case model that we used into our system is:

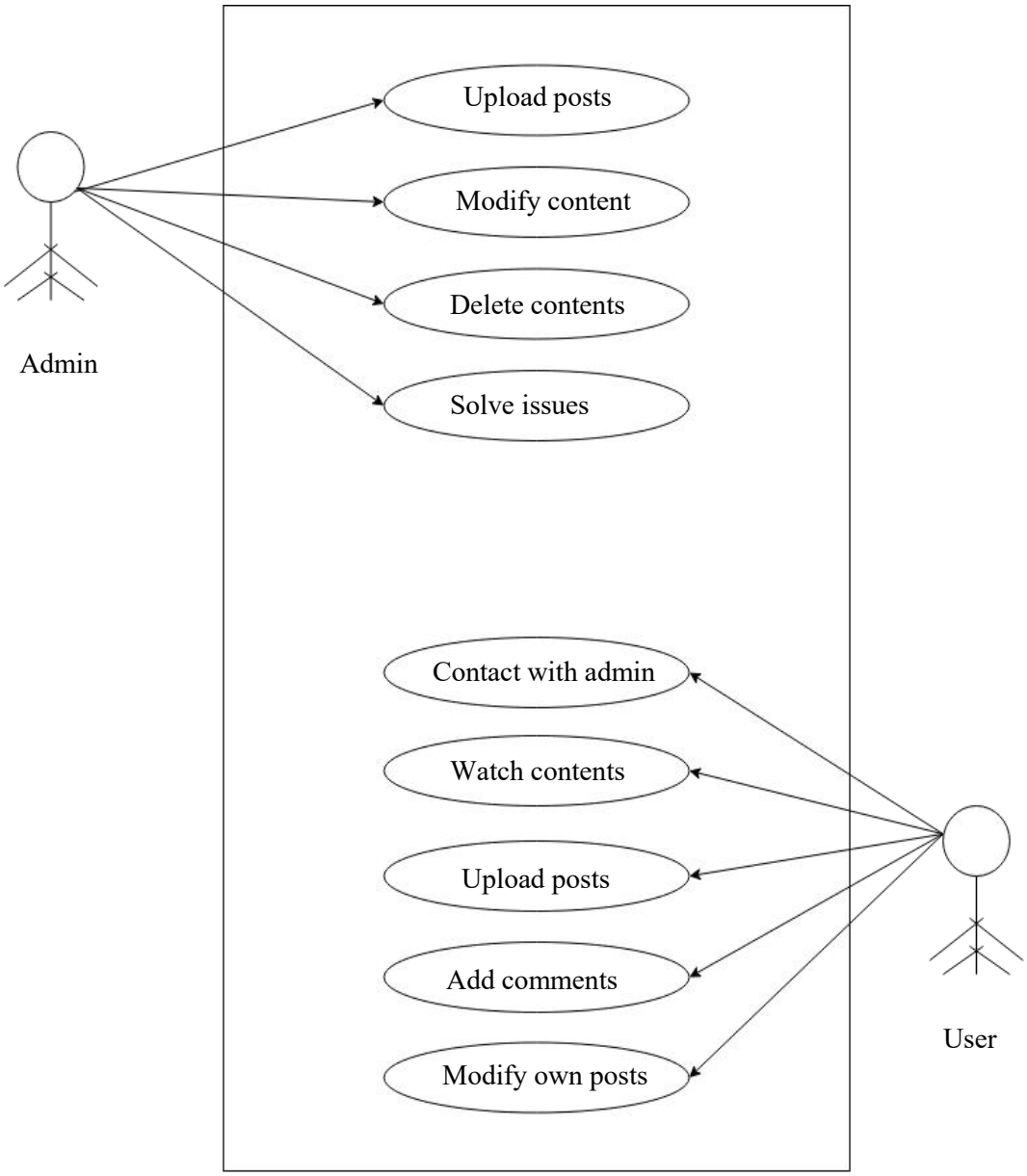


Figure 3.3: Use case model

In this figure 3.3 Here we have total four categories of product (Smartphone, Laptop, Desktop, Tv) an each of them have separate data model and users like admin and users who have different roles to play and admin will add, delete, modify and posts and upload videos and if any problem occurs he will solve issues for them and update their posts if they make any mistake and send push notification .On the other hand, users can watch all the contents and upload posts only his side and remove and modify his posts only and add value able comments to give feedback to any product related posts and he can scan QR code to get information of any product having QR code and send email to admins if any problem faced by him.

3.4 Logical Data model

It is also called as ERD which tells us what type data we are using to make our application. We have used **Firestore** as a backend and for storing our posts data we need data model to connect our application to the backend and retrieve complete information based on that model to our see all post activity. Firestore use **NOSQL** based **non-relational** database structure as it has its own unique key for each **collection** and it has **documents** as a child of collections, document has their own data **fields** where all our data will be stored. That data is our model we have used previously to build our posts activity. Even each user has their own **unique** (hash) key to identify themselves separately. Whole data is stored in **JSON** format and parse through its own API **request** and getting **response** from it. For Creating group and group chat we have used Firebase own **Realtime-database to** store all users and admins chat list in a unique key where the message data, user g-mail and timestamp data.

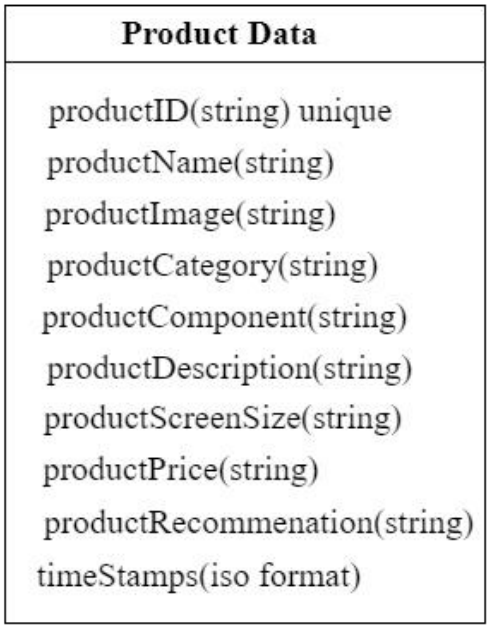


Fig 3.4.1: Products data

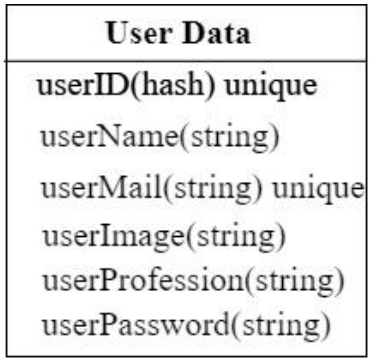


Fig 3.4.2: User & Admin data

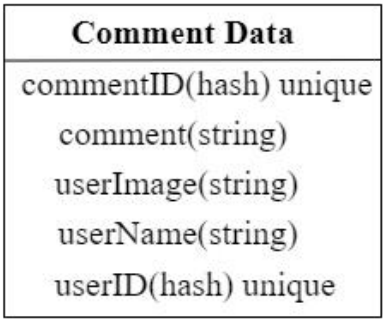


Fig 3.4.3: Comments data

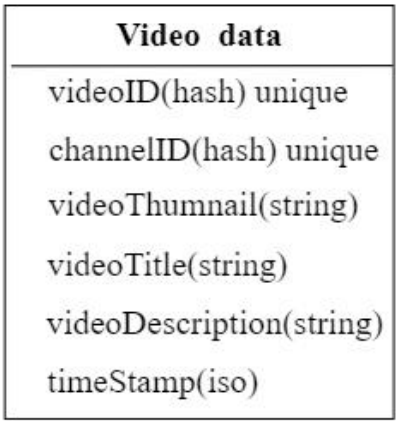


Fig: 3.4.4: Video parsing data

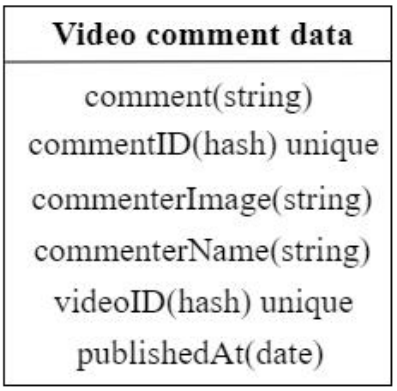


Fig: 3.4.5: Video comments data

Figure 3.4: Data model

3.5 Design requirements

Design requirements are essential part of any application that helps us doing the project in an efficient and planned way as we can understand what is the role of different people including admin and users in making the project successful and divide the work based on the role and requirement of each phases of people who are related to project management. We can understand the core of project by this design requirements. Let's see figure 3.5 and understand the role of users and admin:

What is the main purpose of design requirements?

It is very important in making high quality application special in big project it is necessary to make a design where we can understand the role of every sectors of people that helps us making the project in a good and optimized manner. If the design is good that we can understand every part of it then we can implement is much better compared to any slow and poor design build application. It is highly recommended to any good project in general.

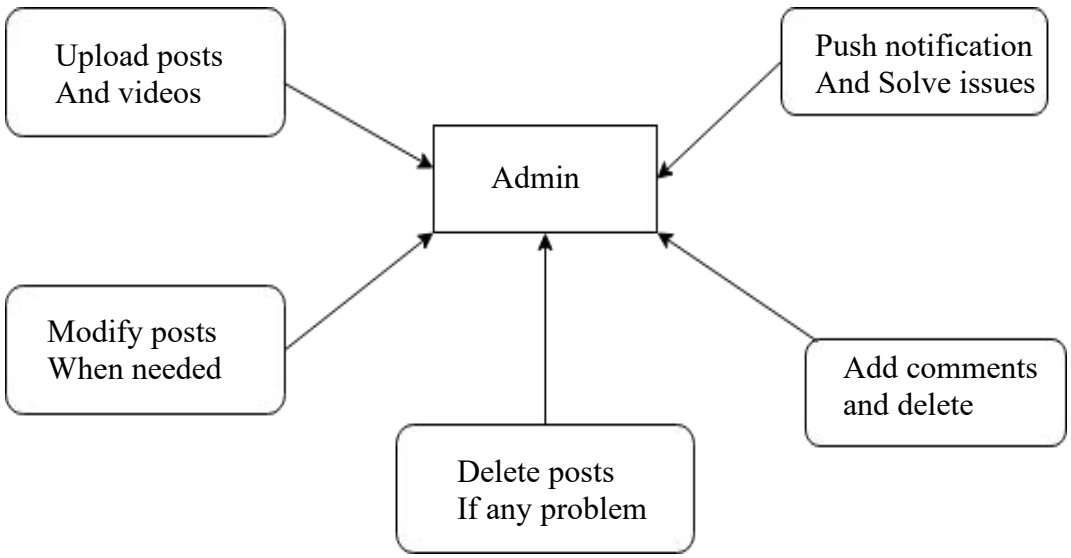


Fig 3.5.1: Design requirements for admin

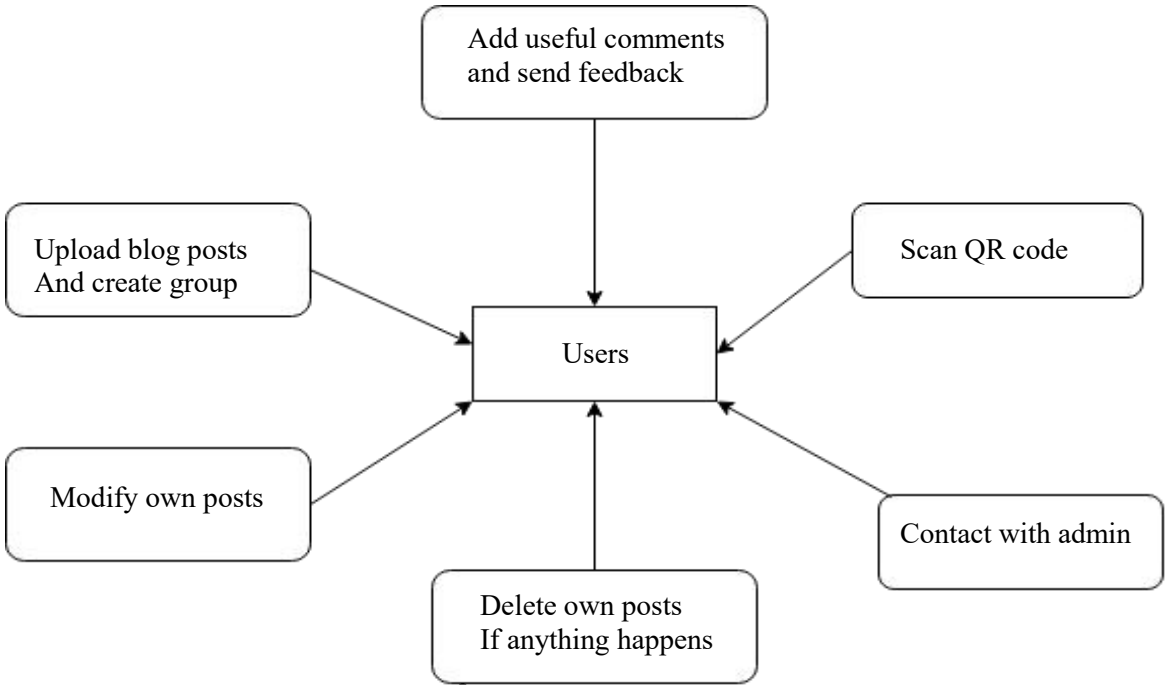


Fig:3.5.2 Design requirements user

Figure 3.5: Design requirements

By looking at the given figure 3.5 we can understand design of our application where we can see there are 2 different types of users monitoring one is admin and users. Admin as usual have much more control over application and they can upload posts on related products to help users to know and modify, delete anyone's post and add comments and delete them (own and users) if necessary. They will send important notification on latest features and information when they want to do. They will add product videos on their YouTube channel parse them to application and help users getting the best buying guide solution for users as much as possible and most important of all by managing the application. On the other hand, users are the main community builder of the application where they also can add, modify, delete own posts and comments but not others as it is not user role to delete or modify others contents .They will add comments, scan QR code to get information on related products, watch contents, sharing blog posts and videos.

CHAPTER 4
DESIGN SPECIFICATIONS

4.1 Front-End Design (UI)

Front end is the main part of any application where users and others related to application management team interacts with and do different action on the application. It is one of the most important part as defines how good, smooth, responsive our application is and the look defines how high quality our application is and without good look many other aspects are negligible. We used many design libraries and android material design pattern to make it look professional and user friendly.

How effective the design pattern is?

A lot depends on well design and user-friendly user interface (UI) that helps making an app successful and it creates massive impression on users using it. Without good design nobody will even install it let alone using it. Most of the application that are famous have amazing design.

Fig 4.1.1: Splash screen

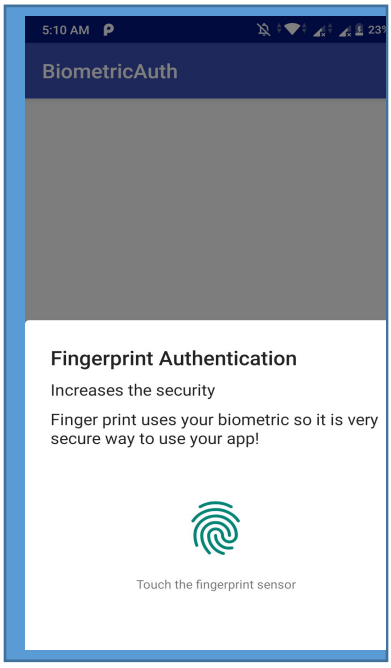


Fig 4.1.2: Fingerprint Auth

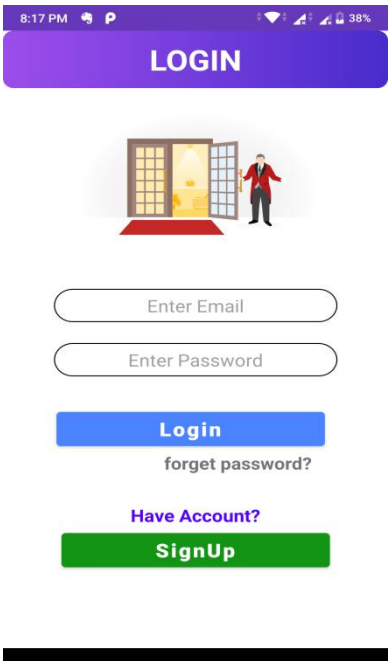


Fig 4.1.3: Login

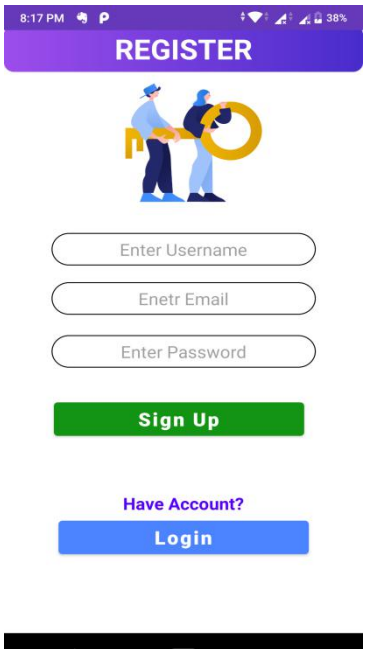


Fig 4.1.4: Registration

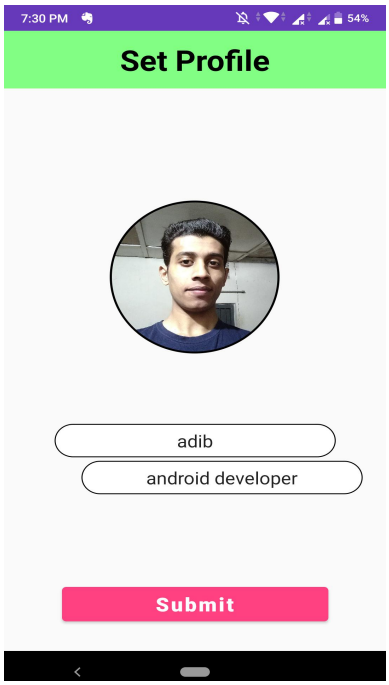


Fig 4.1.5: Set profile

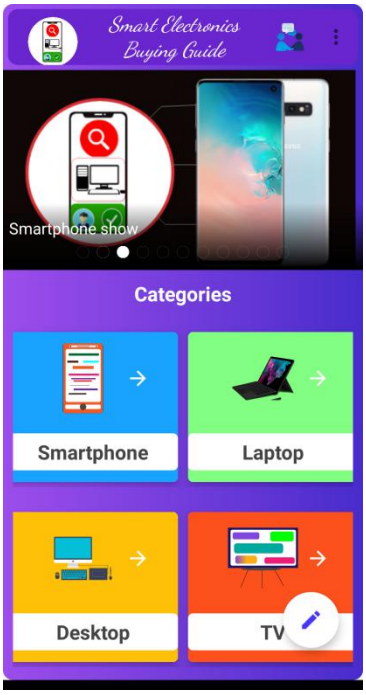


Fig 4.1.6: Dashboard

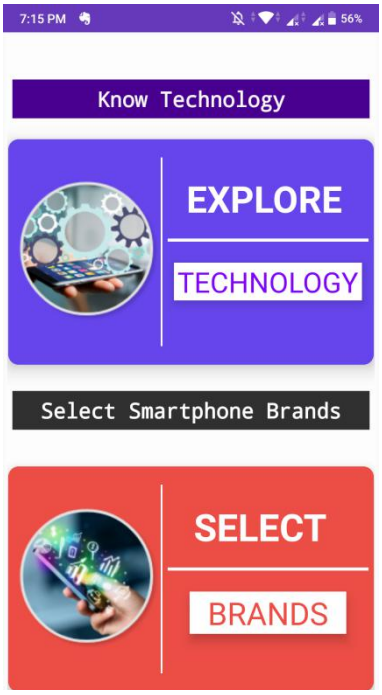


Fig 4.1.7: Choose Tech or Brands

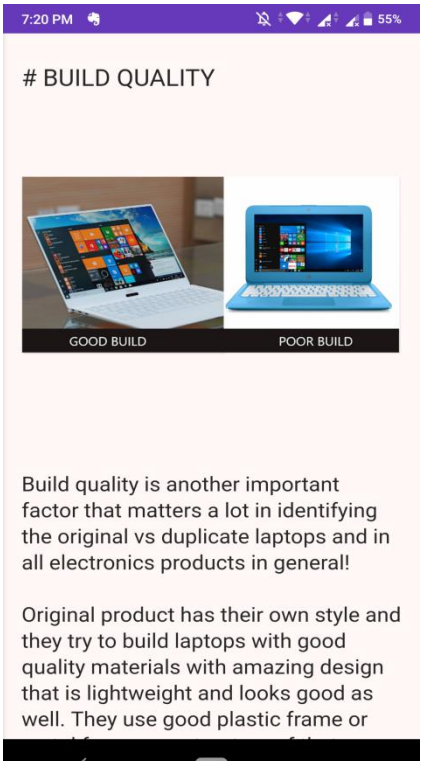


Fig 4.1.8: Read our tech blogs

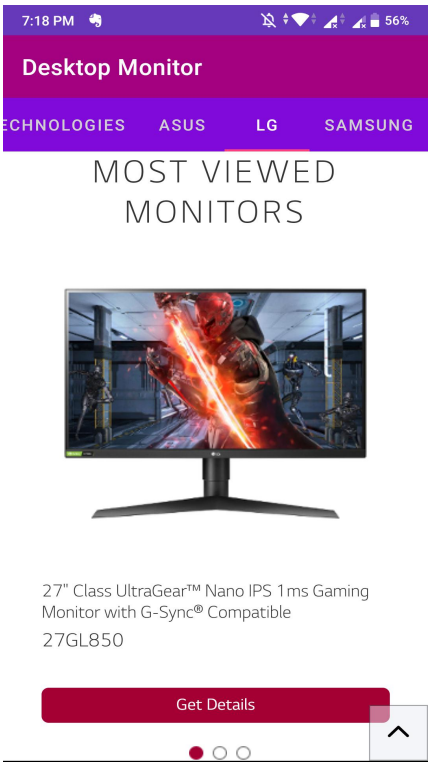


Fig 4.1.9: Visit top websites

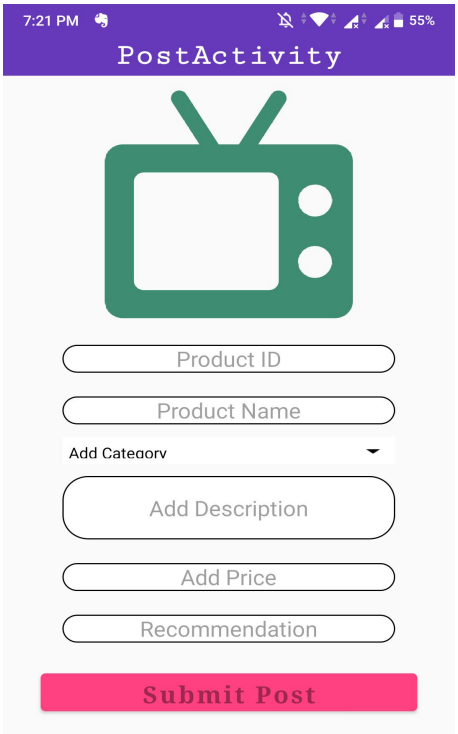


Fig 4.1.10: Upload posts

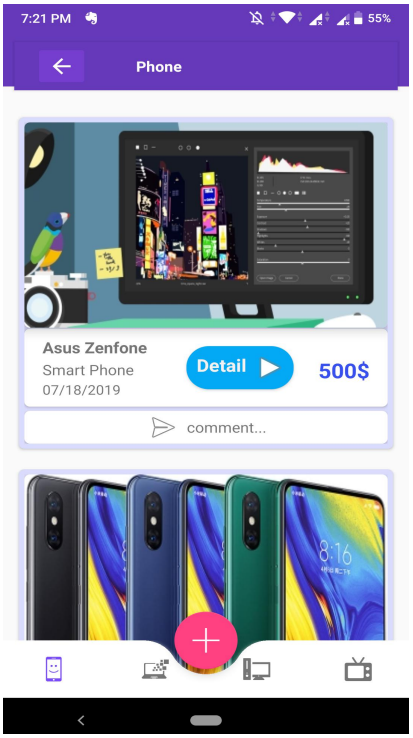


Fig 4.1.11: See all posts

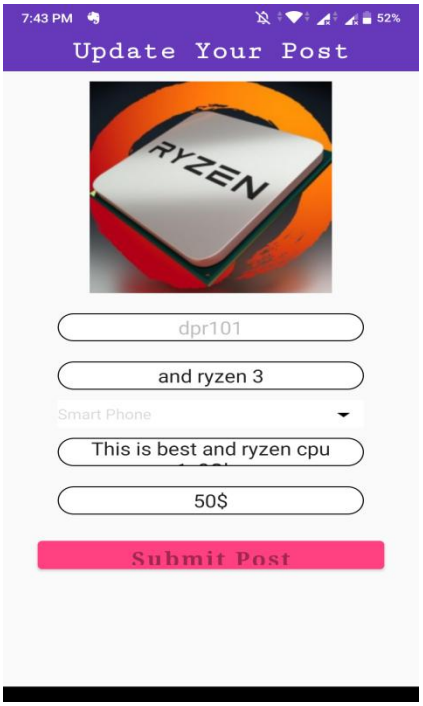


Fig 4.1.12: Update posts

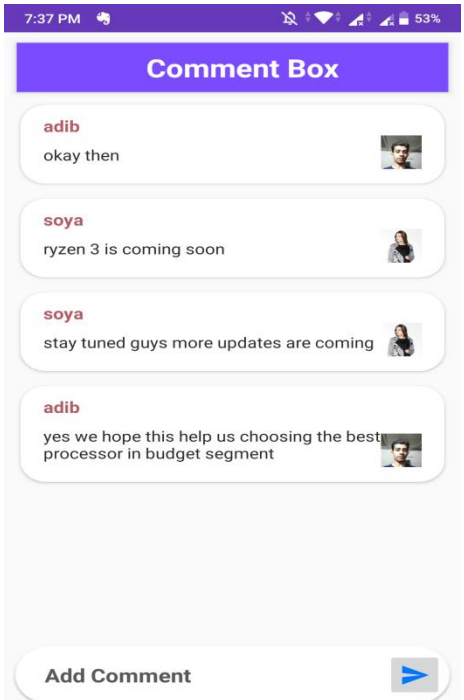


Fig 4.1.13: Add comments

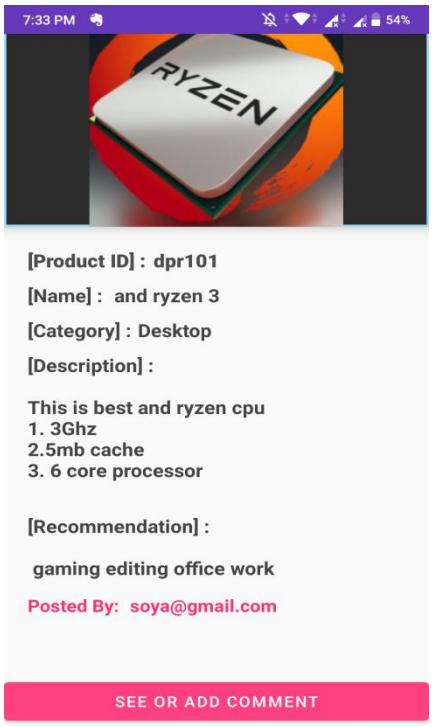


Fig 4.1.14: See posts details

Fig 4.1.15: Crop images

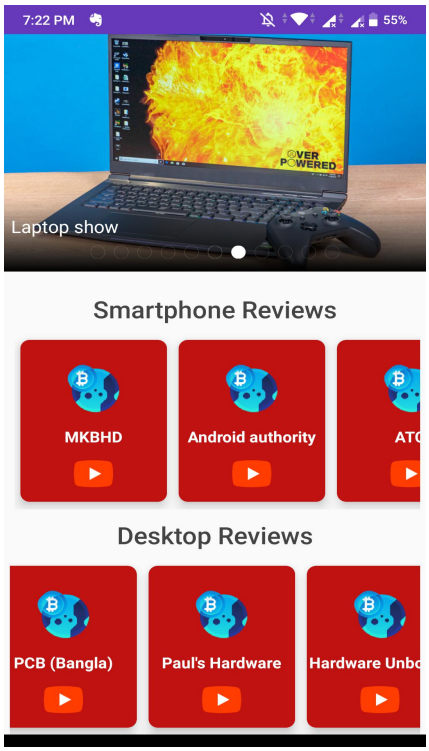


Fig 4.1.16: See all expert video

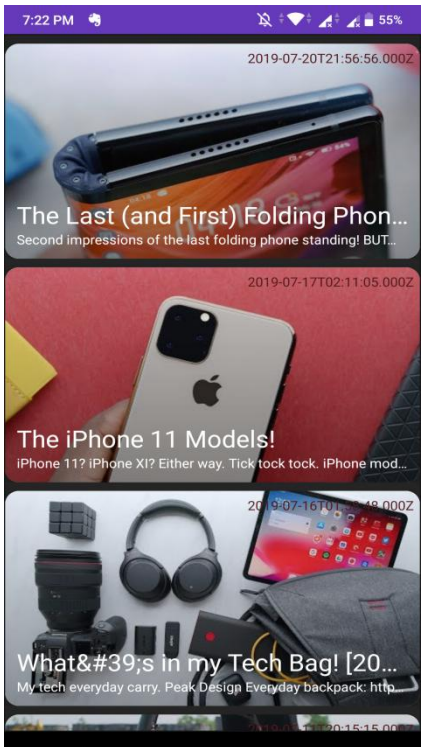


Fig 4.1.17: Video lists

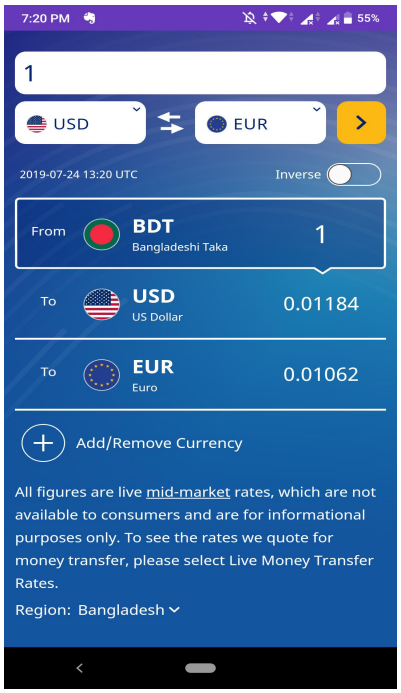


Fig 4.1.18: Convert live currency

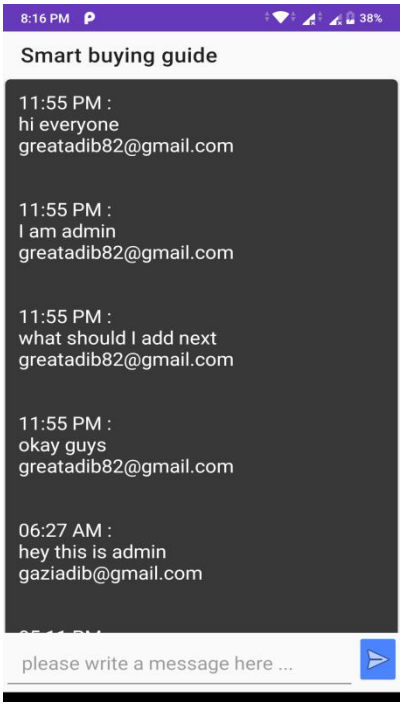


Fig 4.1.19: Group chat

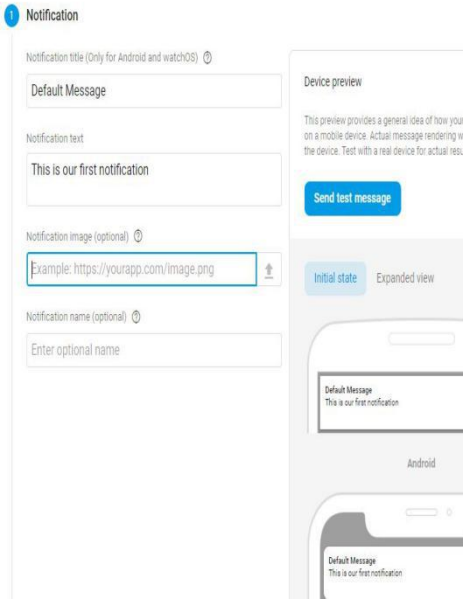


Fig 4.1.20: Push notification

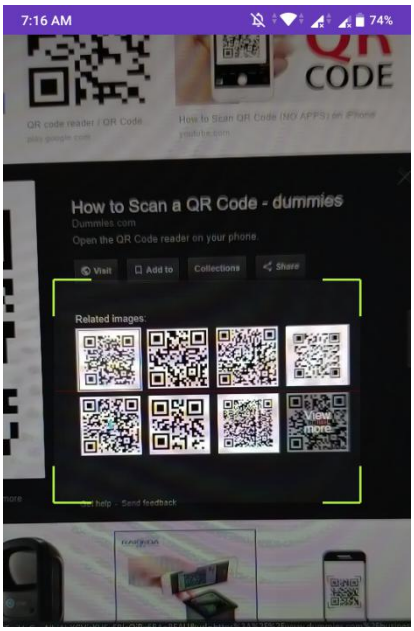


Fig 4.1.21: Scan QR code

Figure 4.1: Front end design

4.2 Back-end design

Any good project has a backend database to hold all information and data (image, text, date, hash, id) to maintain a project. Without a proper backend design a system becomes static and useless and not worthy for any users and in general a project us called a failed one. In order to make a project useful is making good backend and frontend system that users can interact and get the information what they need. In our project we have used Firebase firestore as our main database system. In figure 4.2 we will discuss about our backend database and how we implement it.

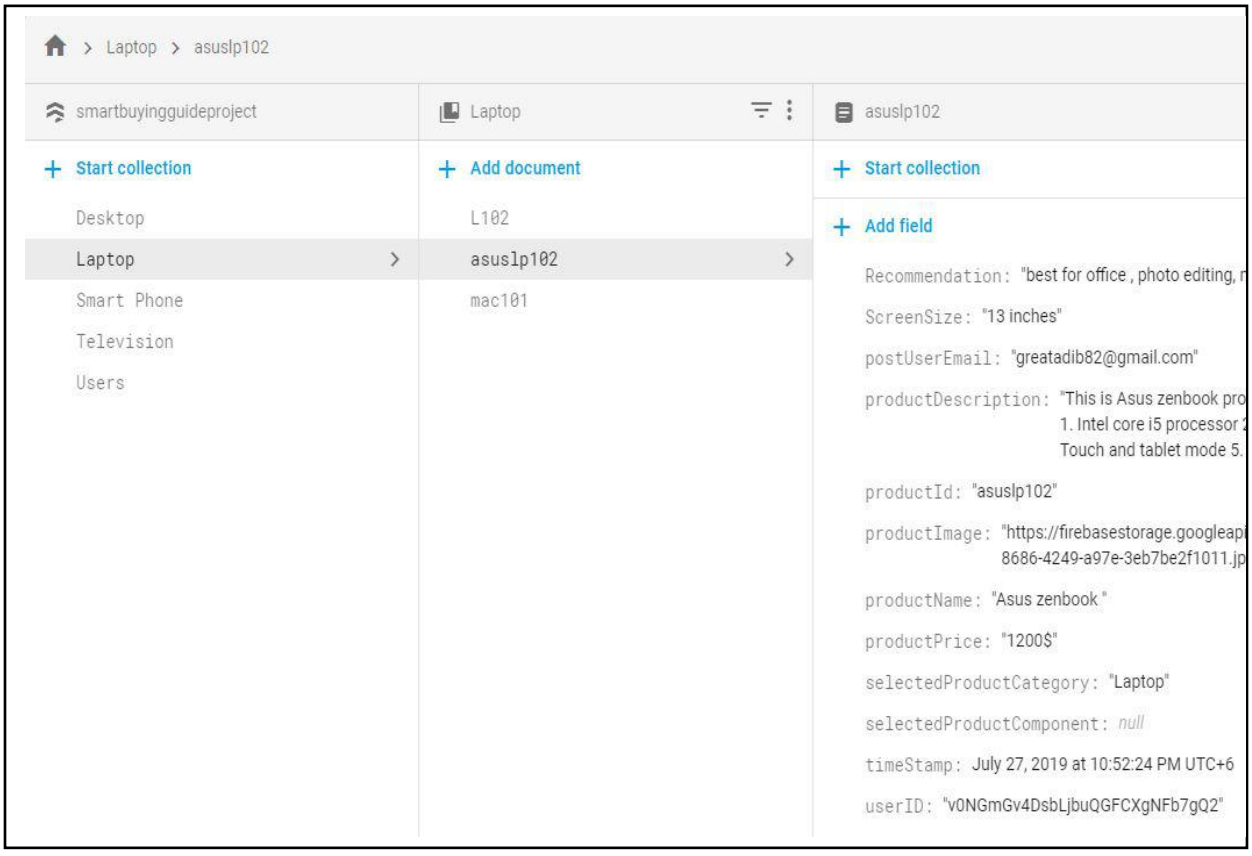


Fig 4.2.1: Firestore collection of product information

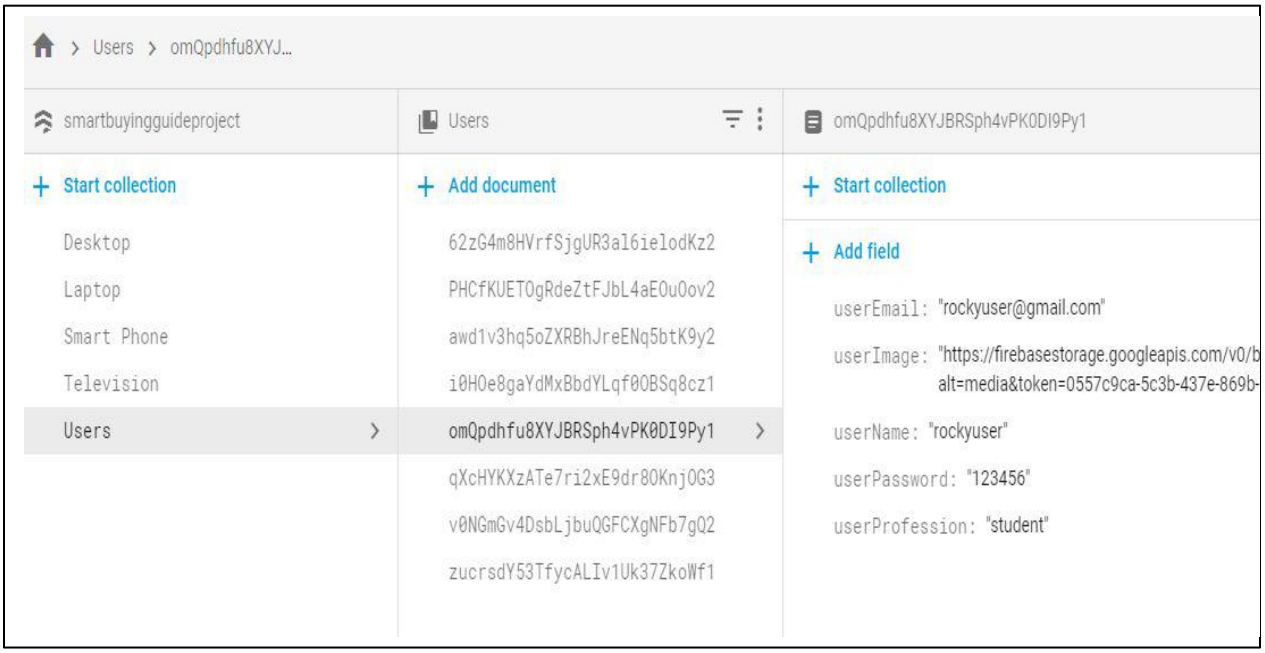


Fig 4.2.2: Firestore collection for unique user data

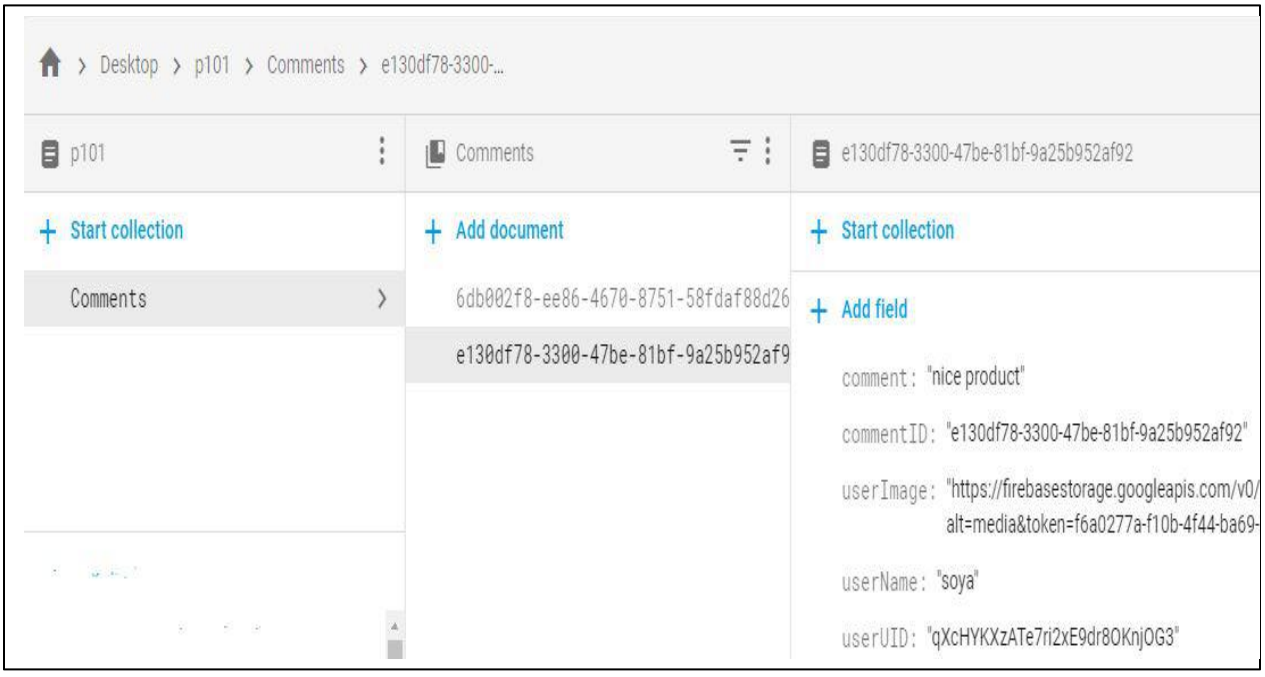


Fig 4.2.3: Collection of comment

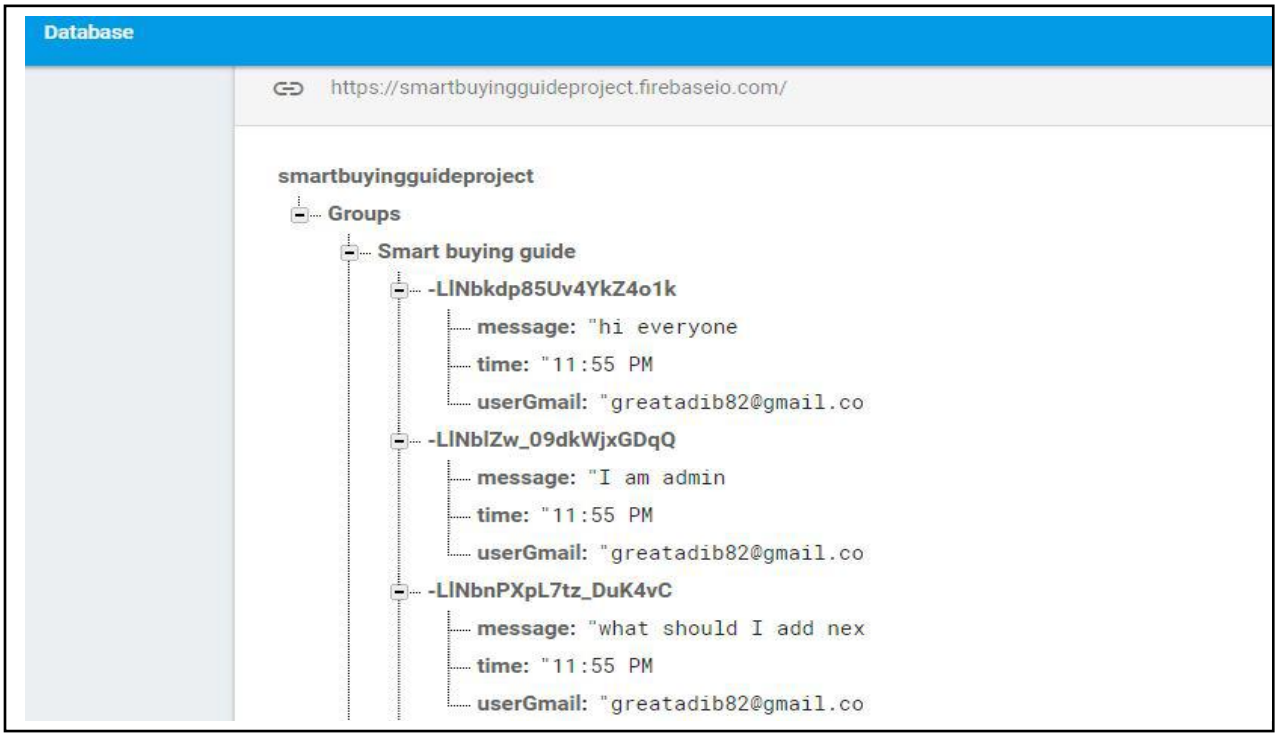


Fig 4.2.4: Group Chat data Realtime

Fig 4.2.5: Json Video API request

Fig 4.2.6: Json based Blogger post API request

Figure 4.2: Back end design

From figure 4.2 as we can see our firebase **firestore** database console page for maintain our backend database for products, users, comments, videos, blogs etc. Firestore is designed in **NOSQL** way that means we do not have to use primary key or foreign key like we use in SQL in many platforms which is relational database. But in this Firestore database it is based on **collection** (table) of products category and their corresponding **documents** and data **fields (row)** For each **unique** categories and products for unique **userId (hash**). All fields are **JSON** formatted and they are parsed through API request from backend to frond end to give proper response to users.

Key technologies for our backend design:

- Firebase Cloud Firestore (main database)
- Firebase Realtime-database (Group chat)
- JSON response (API based)
- Retrofit response (API based)
- Firebase Storage (holding images data)

4.3 Interaction design and UX

Interaction is a part of UX design and although there are some similarities and differenced between then in technical term. Interaction is the users and application connection that means what user can do with the application and functionalities and features of the application is shown in interaction design. On the other hand, UX design is just the frontend UI and activities of any application that users and client normally used to see and interact on. It does not bother about functionalities of application and what users can do with it, it is just interface of application. It is really vital for any application to be very attractive in design UX and users also know how to use the features that application provides them and how to use then in detail. Without the combination of both UX and Interaction a project is never useful by any means. In the figure 4.3 we will know deeply about them.

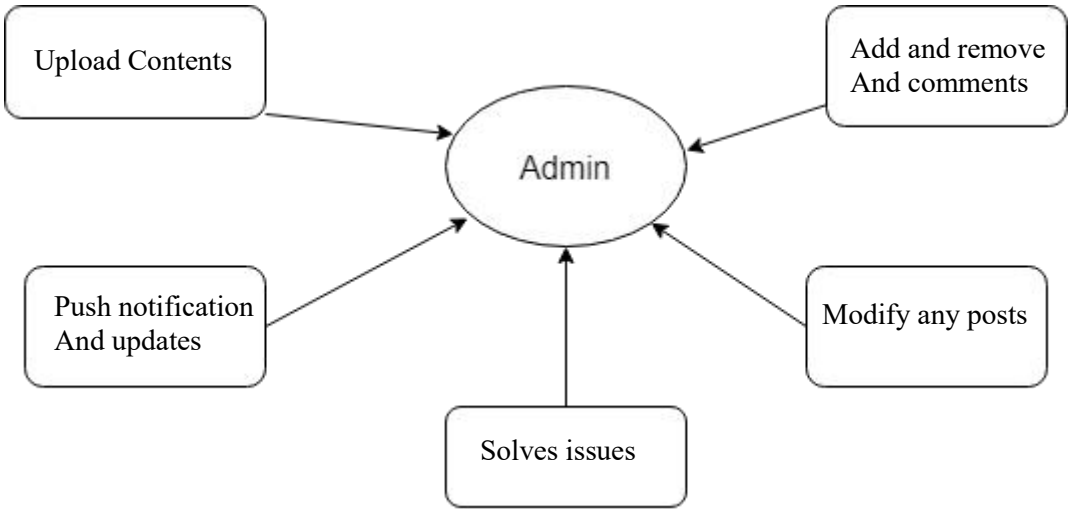


Fig 4.3.1: UX and Interaction for admins

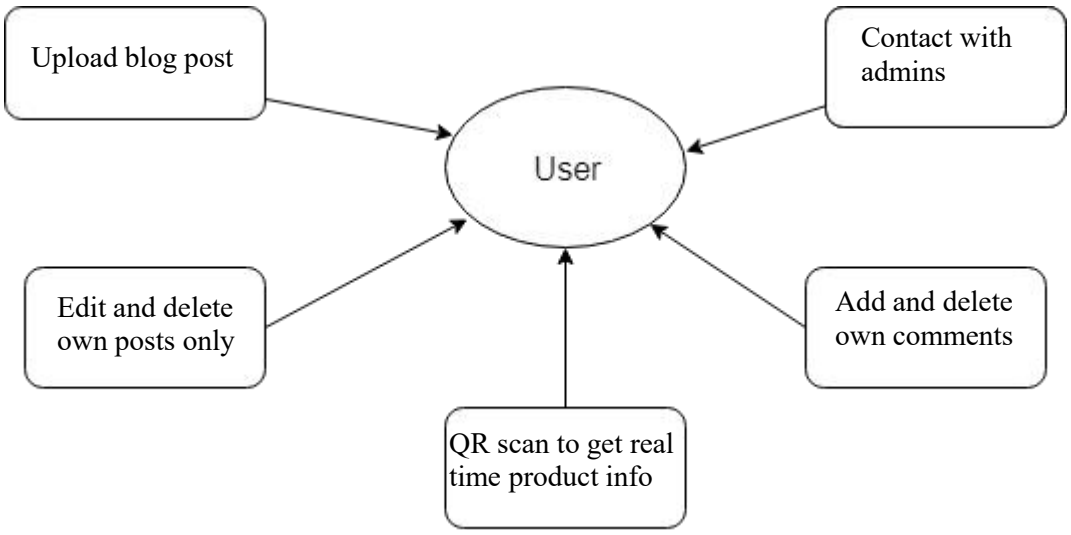


Fig 4.3.2: UX and Interaction user

Fig 4.3: Interaction & UX

Why we focus on interaction and UX design pattern so much?

Every single application need a good UI and interaction system to be useful for all users and clients in general and having proper implementation of those design pattern is the key to success of any project and specialty android based project has massive impacts on smooth, responsive, attractive and material based UX design to get in touch with most users and user interaction is for letting them know our application and how they should interact with lots of functionalities that we have implemented in our application.

The pattern we tried to follow to design UX and Interaction of our application:

- Interactions based on different categories of users (admin, user).
- Android Material based design pattern using cardview, recyclerview etc. libraries.
- Optimized GUI (Graphics User Interface) for smartphones.
- Proper systems workflow of various functionalities, activities and fragments
- Ensure proper intents and activities navigations for ease of use.
- We also made dummy model first in Adobe XD then implement on XML.

4.4 Implementation requirements

In order to make our application much more effective and useful we tried so many stuff by prototyping, watching many tutorials and researching on various websites, looking and getting ideas from various famous android application and learning from building many small application we gather huge amount of knowledge and then we make models in adobe XD and Photoshop then implement in our main application. We had to use lots of third-party libraries and google based APIs to make our project more useful in many ways as we can. We used Java as our main language to make all functionalities in our application.

CHAPTER 5
IMPLEMENTATION AND TESTING

5.1 Implementation of back end database

The main database is Firebase **Firestore** that we used as it is easy and cloud based **NOSQL** database and it hold data in a **collection** and **documents** has some fields we defined that hold various data that we want to store in **JSON** format. We do not have to worry about any primary and foreign key to link different collection which is easy to use and effective.

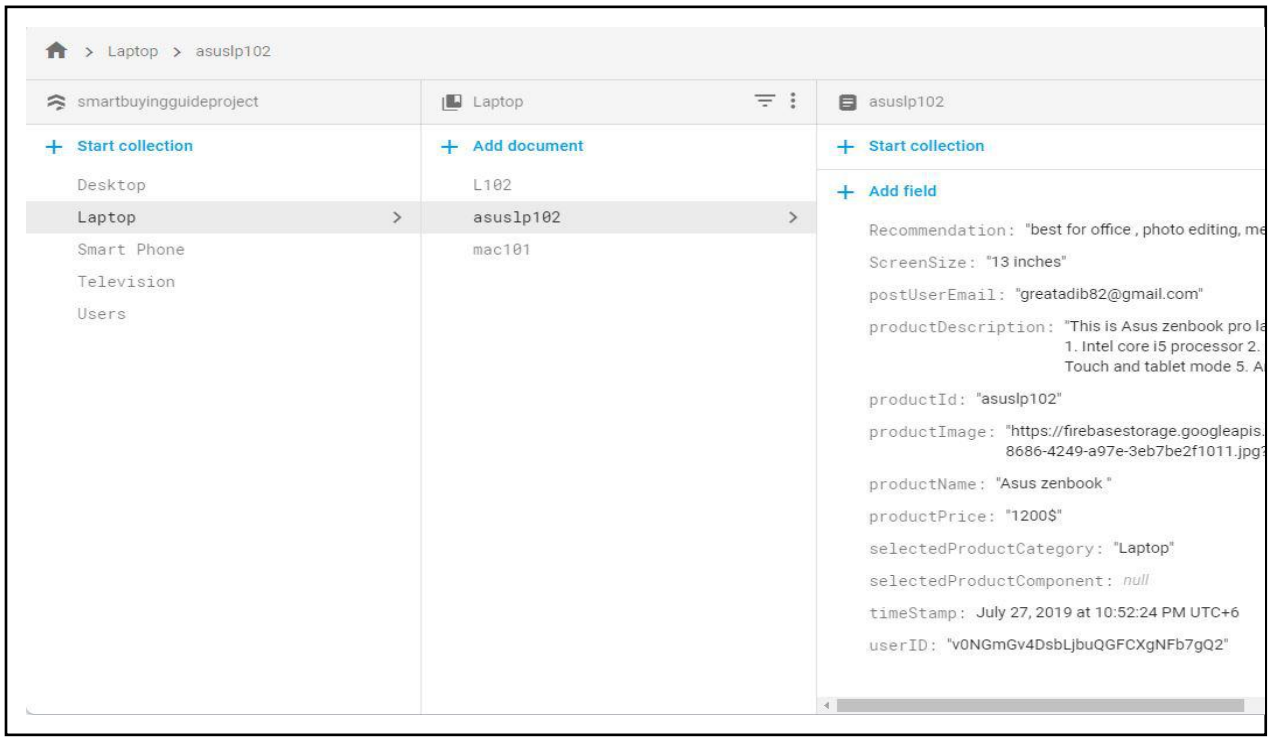


Figure 5.1: Implementation of database

Installation requirements:

- Java (as main language)
- Firebase Firestore (as database backend)
- Firebase Storage (as Image storing)
- Firebase JSON API (to connect Firebase)

5.2 Implementation of front end designed

In order to implement of our application front-end design, we have used XML (Extensible Markup Language) for layout structure and design of different component like button, edit text, Image, text etc. and we used various design libraries to improve user interfaces of our project.

- XML (Structure and design)
- Java (Implement functions of structure)
- Adobe XD (prototyping)
- Adobe photoshop and illustrator (icon design)
- Various third-party libraries.

5.3 Implementation of interactions

When we finished our main interface, we then implemented various features step by step and added login. Register, fingerprint, splash screen, intro screen, database, API based web services parsing like fetching latest post from our blogger blog posts with retrofit and YouTube videos, then added various websites for users to visit using advance Web view built in android and organize then in an efficient way then added QR code scanner to get information of any product just by scanner the code and finally we have a section where we can convert our currencies and check blogs on original vs duplicate products. We also added comment section for more feedback from users and admin push notification to fetch user latest updates.

5.4 Testing implementation

Every application needs to be tested before they can be used by users or client and it is vital as we cannot make any application without any bugs or errors in it. It is our duty to check runtime errors and compile time errors both and check if every functionality that we have implemented works properly or not like uploading posts to database and sending email to admin, checking add, edit, delete posts, QR code scan, video parsing properly or not and JSON data parsing is being done properly. Checking login, registration are successful or not, sending push notification is sending proper valid data etc. are prime example to testing along with data validation and verification.

5.5 Test results and reports

Every application needs testing for the betterment of making it useful to users and testing the application show how capable the application is in many different conditions. We normally do

- Integration test
- System test

Table 5.1: Integration test table

Test case ID	Test case objective	Test case description	Expected outcome
1	Check Fingerprint Working correctly or not.	Authentication using Fingerprint to get into main application	Users successfully Entered to application
2	Check product blog posts are uploaded to to database or not	Checking entire posts data Are being added to our database system.	To upload full product Details to backend
3	Checking push notification are sending data or not	Notification are sent with accurate information and data to users	To send accurate data to users and clients
4	Checking QR code scan working properly or not	QR code scan fetching the right information for any products after scanning	QR code scanner finds the perfect related information about products

Table 5.2: System test table

Functions	Description	% Execute	% Passed	% Pending	Remarks
Data validation	Bad formatted g-mail will not be added to database.	100%	100 %	0	
Data input	All data input values have to be added properly in add post activities in data fields to post	100%	100 %	0	
QR Scanning	After Scanning QR code it Finds related product information perfectly With very accurate prediction	100%	100 %	0	
Upload data to database	Data of products are added Properly and we can see at database console	100%	100 %	0	
Update data	Updating with correct data and sending again to back to database to update products information	100%	100 %	0	
Email to admin	Mail to admin is to let them know if any problems occurs	100%	100 %	0	
JSON data parsing	JSON parsing all the backend data as required from various APIs	100%	100 %	0	

CHAPTER 6
CONCLUSION AND FUTURE SCOPE

6.1 Discussion and conclusions

When we first determined to make an effective application that helps huge number of people around the globe and specially in our country where need proper and **authentic buying** guide to electronics they buy and the main goal was to help them from buying wrong, duplicate, getting faulty products from low quality ecommerce sites and giving them real-time feedback. Then we planned a design of our app just to get into action to make it possible. We tried so many ways to find solutions how to implement them by learning from YouTube, getting resources from different websites like Stack Overflow, Codelab, Github etc. and doing discussion among team mates on how to make it effective and what type of features we will add etc. to make it useful to all and acquire what we wanted to make. We also researched a lot on electronics technological part as we have to know properly about them before give others **guide and recommendation.** Finally, with hard work and dedication we make it possible and we will improve it day by day to make it more effective from now on.

6.2 Scope for further developments

We are now making it as our first edition of our application but this is never the end of our application, we will make it more modern and futuristic as the days are getting more digitalized and we are getting new technologies and developing it with the race of modern technology would our main challenge from now on. Let's see what is our plan for future of this application:

- We want to add more electronics products category to cover more areas.
- Make our own APIs of products to make it more effective and reliable.
- Make more modern UI and UX that will be much easy to use.
- Make our application more efficient and flexible and powerful.
- Users enter requirement of specification in data field and get the recommended products with best budget and features possible.

References

[1] https://www.realsimple.com/work-life/life-strategies/fake-online-reviews, [last accessed on 25th June 2019 at 7.30 AM.]

[2] https://www.powerreviews.com/events/consumers-depend-on-reviews/, [last accessed on 25th June 2019 at 9.41 PM.]

[3] Yi Jin Lim, Abdullah Osman, Shahrul Nizam Salahuddin, Abdul Rahim Romle, Safizal Abdullah, Factors Influencing Online Shopping Behaviour: The Mediating Role of purchase Intention, October 5th & 6th, 2015,[last accessed on 29th June 2019 at 7.00 PM.]

[4] Bettina von Helversen, Katarzyna Abramczuk, WiesławKopeć, Radoslaw Niele, Influence of onsumer reviews on online purchasing decisions in older and younger adults, 113, September 2018,[last accessed on 29th June 2019 at 1.00 AM.]

[5] Tao Zho, Understanding Online User Participation: A Social Influence Perspective, Emerald Group, vol 1, page 2, January 28, 2011, [last accessed on 30th June 2019 at 8.00 AM.]

[6] Saylor, Consumer Behavior: How People Make Buying Decisions. Retrieved from Saylor Website: http://www.saylor.org/site/wpcontent/ uploads/2013/02/BUS203-PoM-Ch3.pdf, [last accessed on 30th June 2019 at 11.30 PM]

[7] Roca, J. C., Garcia, J. J., Vega, J. d., The Importance of Perceived Trust, Security and Privacy in Online Trading Systems. Information Management and Computer Security, 17(2), 96-113, June 2019, [last accessed on 5th july 2019 at 11.50 AM]

[8] Alina Stankevich, Explaining the Consumer Decision-Making Process: Critical Literature Review, vol.2, page 9, September 2017, [last accessed on 7th july 2019 at 5.10 PM]

[9] https://en.wikipedia.org/wiki/CNET, [last accessed on 7th july 2019 at 8.45 PM]

APPENDIX

Appendix: Project reflection

Project reflection as the name suggests shows us the projects structure and the files, folders in the application project files and how we implemented our code and how organized our code is defines by looking at project reflection. It is a real-world software engineering scenario and gives us complete idea of every important aspects of project management as file organization process.

While making our application **Smart Buying Guide System** we learned so many techniques and ins and out of software engineering and how to manage them and how to work on big modular project and divide work as a team and how we can research properly and so on. It is a huge learning curve for us to make something we want to make and go forward from here.

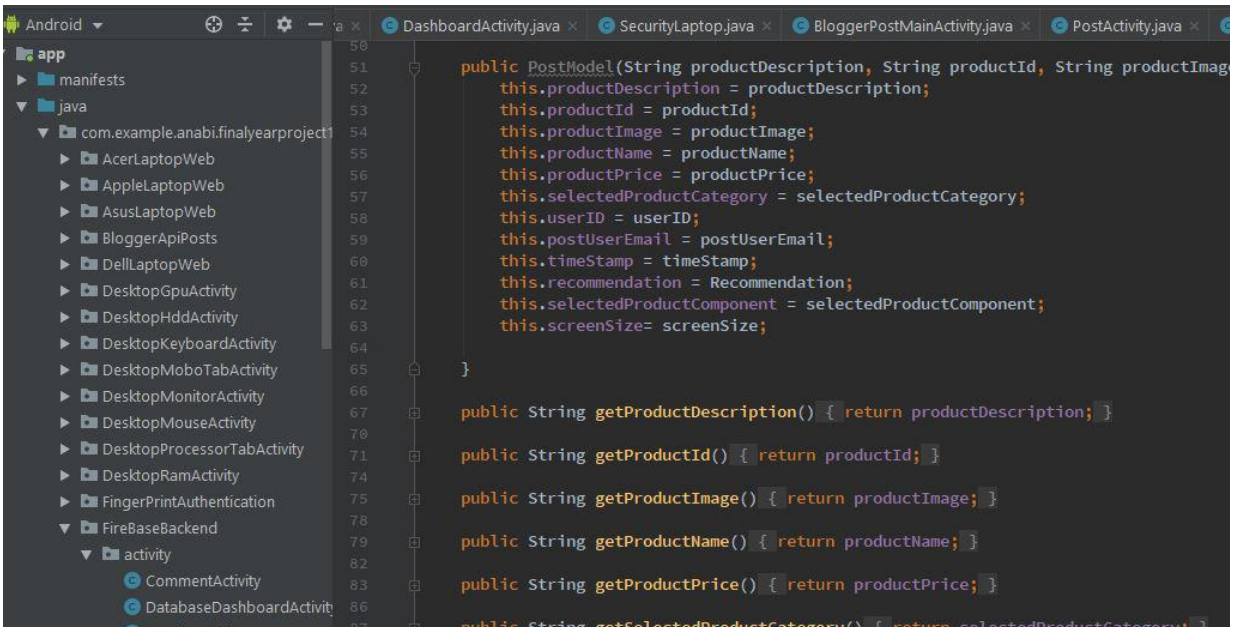
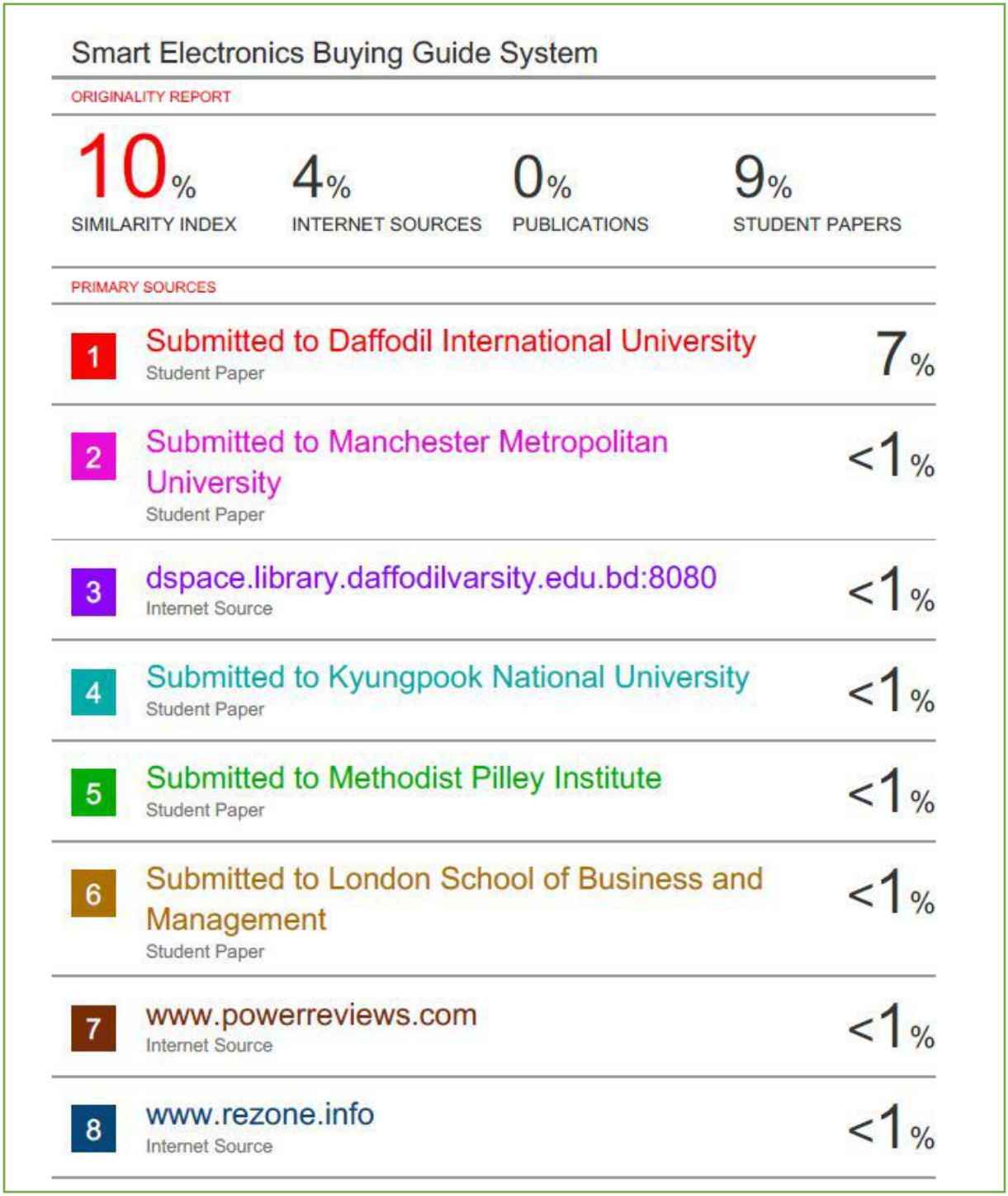


Figure 7.1: Our Code Snippets

PLAGIARISM REPORT

Plagiarism report



Smart Electronics Buying Guide System

ORIGINALITY REPORT

10%	4%	0%	9%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Daffodil International University Student Paper	7%
2	Submitted to Manchester Metropolitan University Student Paper	<1%
3	dspace.library.daffodilvarsity.edu.bd:8080 Internet Source	<1%
4	Submitted to Kyungpook National University Student Paper	<1%
5	Submitted to Methodist Pilley Institute Student Paper	<1%
6	Submitted to London School of Business and Management Student Paper	<1%
7	www.powerreviews.com Internet Source	<1%
8	www.rezone.info Internet Source	<1%

9	deccancollege.ac.in Internet Source	<1%
10	Tao Zhou. "Understanding online community user participation: a social influence perspective", Internet Research, 2011 Publication	<1%
11	Submitted to eCollege Student Paper	<1%
12	Submitted to Higher Education Commission Pakistan Student Paper	<1%
13	Submitted to Saint Paul University Student Paper	<1%
14	dspace.daffodilvarsity.edu.bd:8080 Internet Source	<1%
15	Submitted to Informatics Education Limited Student Paper	<1%