H&M

A

Project Report

Submitted in partial fulfillment of the requirement for the award of degree of

Bachelor of Engineering

In

Computer Science & Engineering

Submitted to

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BHOPAL (M.P.)

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INDORE (M.P.) 452001

2019-2020

Declaration

I hereby declared that the work, which is being presented in the project entitled "**H&M**" partial fulfillment of the requirement for the award of the degree of **Bachelor of Engineering**, submitted in the Department of Computer Science & Engineering at **Acropolis Technical Campus, Indore** is an authentic record of my own work carried under the supervision of "**Prof. Prashant Lakkadwala**". I have not submitted the matter embodied in this report for award of any other degree.

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Anirudha Patil (0875CS171022)

Project Approval Form

I hereby recommend that the project prepared under my supervision titled by **H&M** be accepted in partial fulfillment of the requirement for the degree of Bachelor of Engineering in Computer Science & Engineering.

Prof. Prashant Lakkadwala

Supervisor

Recommendation concurred in

Prof. Deepshikha Yadav

Project In-charge

Dr. Kailash C. Bandhu

Project Coordinator

Acropolis Technical Campus

Department of Computer Science & Engineering

Certificate

The project work entitled "**H&M**" submitted by Name of the student Harsh Borse (0875CS171046), Amisha Joshi (0875CS171020), Anirudha Patil (0875CS171022), Adishri Jain (0875CS171009) is approved as partial fulfillment for the award of the degree of Bachelor of Engineering in Computer Science & Engineering by Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal (M.P.).

Internal Examiner

Name:…….

Date: …./…/……..

External Examiner

Name: ……..

Date: …./…/……..

Acknowledgement

With boundless love and appreciation, we would like to extend our heartfelt gratitude and appreciation to the people who helped us to bring this work in reality. We would like to have some space of acknowledgement for them.

Foremost, we would like to express our sincere gratitude to our supervisor, **Prof. Prashant Lakkadwala** whose expertise, consistent guidance, ample time spent and consistent advice helped us/me to bring this study into success.

To the project in-charge Prof**. Deepshikha Yadav**, for their constructive comments, suggestions, and critiquing even in hardship. We also want to thank project coordinator Prof**. Dr. Kailash C. Bandhu** for letting my work be an enjoyable moment and for your brilliant comments and suggestions.

To Prof. **Prashant Lakkadwala**, Head, Department of Computer Science & Engineering for his favorable responses regarding the study and providing necessary facilities.

To the honorable **Dr. Sanjay T. Purkar**, Principal, ATC, Indore for his unending support, advice and effort to make possible.

Finally, We would like to pay our thanks to the faculty members and staff of the Department of Computer Science & Engineering for their timely help and support.

We also like to pay thanks to our **Parents** for their eternal love, support and prayers. Without them it is not possible.

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Abstract

Mobile applications can be one of the best ways to keep consumers engaged with a brand as they are on the move. With the increase in demand for smartphones and efficiency of wireless networks, the demand for mobile applications has increased incredibly. Android is one of the most popular open source platforms that offer the developer full access to the framework API' s so as to build innovative applications. Our project “H&M" is an android application which will revolutionize the shopping market. This project basically helps the customer to get rid of the long queue in the shopping malls and supermarkets. The main aim of this project is to build an Android application which is user friendly and efficient . Computerization can be helpful as means of saving time and money. The Shopkeeper can register and login to the app by email id as well as using phone number with the help of automated OTP login. With the help of our application customers can buy anything by just a snap of fingers. All they have to do is scan the barcode on their desired product and pay through their ewallet. Shopkeepers can keep the records of their products and all its details. Our application saves a lot of time and prevents lots of frustration . Customers will also have an add to cart feature. Admin can communicate with registered members through message.

The admin should use digital entry of data in order to maximize productivity. Details of each and every product will be updated time to time . The main motive we have in mind is to save a lot of time and make life less miserable .

Table of Content

Chapter 1:

Introduction

Everyone out there needs resources to run their life smoothly and that's the reason shopping malls and supermarkets exist but the problem with these malls and markets is the long billing queues. The problem with the existing system is that there are supermarkets and numerous billing counter but lesser employees where it is very tedious to work with the pace without wasting time. A mobile based application which can be used at every mall and supermarket where customer just have to scan the barcode of the object and simply pay .You just have to scan the barcode of the item and add it in the cart and you can also pay online from your e-wallet or UPI.

1.1 Rationale

To provide a frictionless checkout experience and to make the life of people less frustrating and even less complex. To develop something which can help in checkout and which is easy to handle, we tend to create an application which is connected to the store's inventory with all the products and their details.

1.2 Goal

The goal of the project is to put in place new solutions for providing ease to the customers in the process of shopping with the help of latest technology and machine learning while providing features to business also for their benefits; so that the accuracy, speedup, digitalization of the system will be enhanced. To do this:

(a) Provide an efficient system for shopping and billing at supermarkets.

(b) Provide effective solutions for the problem of long billing queues.

(c) Provide a simpler environment for self generation of bills and also to pay it.

(d) Accurate method needs to be adopted for the safe and effective outcomes

(e) Provide shops to feature products in the apps to customers.

(f) provide custom ads to users with ML module

1.3 Objective

The objective of the works is to propose options for self generation of the bills of the purchased items from the supermarkets and then for the payments as well. To do this it requires to:

(a) Review and study different billing systems being used at supermarkets.

(b) Find out the difference between the current going scenario and the system proposed by us.

(c) Propose a faster solution for the people suffering from the frustration of standing in longer queues at supermarkets.

(d) Propose solution for the systems that work on different nodes.

1.4 Methodology

RUP stands for "Rational Unified Process." RUP is a software development process from Rational, a division of IBM. It divides the development process into four distinct phases that each involve business modeling, analysis and design, implementation, testing, and deployment. The four phases are:

1. Inception - The idea for the project is stated. The development team determines if the project is worth pursuing and what resources will be needed.
2. Elaboration - The project's architecture and required resources are further evaluated. Developers consider possible applications of the software and costs associated with the development.
3. Construction - The project is developed and completed. The software is designed, written, and tested.
4. Transition - The software is released to the public. Final adjustments or updates are made based on feedback from end users.

The RUP development methodology provides a structured way for companies to envision creating software programs. Since it provides a specific plan for each step of the development process, it helps prevent resources from being wasted and reduces unexpected development costs.

1.5 Role

Initial stages when the problem was recognized , a brief study was carried out over the current billing system being used in the supermarkets and various shopping malls by the members of our team. Once the system was carefully understood, the objective was to propose a faster and effective solution for it. For that the development of the application started. Further to test the code effectiveness certain products were scanned by their barcodes, their prices were collectively added and then the bills were generated for the same. Afterward the payment gateway was also tested. Then in the documentation portion the work of report generation was carried out by the team members and the presentation of the final application in working condition was carried out.

1.6 Contribution of Project

The project will contribute to save a lot of precious time of people which is currently being wasted in the longer queues at the markets. This problem will efficiently be solved by the project which provides an efficient and effective measure of self generating bills and pay for the same.

1.6.1 **Market Potential:** This idea can be deployed in long term future prospective. This idea can also grow very well in the market as it increases the ease of customers and it is completely free. Interface is exciting and user acceptable.

1.6.2 **Innovativeness :** The idea of self bill generation was quite innovative because this is a very big problem in current scenario but it remained under negligence over a huge period of time and that is the reason that no efficient solution of this problem is encountered yet. But this innovative idea will successfully and much efficiently sloves this big problem.

1.6.3 **Usefulness :** The product reach would be spread to all customers who are struggling to bill and pay for the items at markets and shops .We tend to create a better shopping environment for people. There will be no stress of the billing queue and apart from this much of the time will be saved which can be utilized somewhere else productively.

1.7 Report Organization

The remaining section of the report is structured as follows. Chapter 2 provides detailed business and technical requirements. Different steps taken for information collection are also discussed in this chapter. Chapter 3 provides details of all the diagrams related to the project and the integrity and entity constraints. Chapter 4 then gives all the necessary details of implementation in terms of software and hardware. It also provides necessary details for testing and Future works.

Chapter 2

Requirement Engineering

2.1 Requirements engineering (RE):

It refers to the process of defining, documenting, and maintaining requirements in the engineering design process. Requirement engineering provides the appropriate mechanism to understand what the customer desires, analyzing the need, and assessing feasibility, negotiating a reasonable solution, specifying the solution clearly, validating the specifications and managing the requirements as they are transformed into a working system. Thus, requirement engineering is the disciplined application of proven principles, methods, tools, and notation to describe a proposed system's intended behavior and its associated constraints.

Requirement Engineering Process:

It is a four-step process, which includes -
Requirements elicitation
Requirements specification
Requirements verification and validation
Requirements management

2.1.1 Requirements Management:

Requirement management is the process of analyzing, documenting, tracking, prioritizing and agreeing on the requirement and controlling the communication to relevant stakeholders. This stage takes care of the changing nature of requirements. It should be ensured that the SRS is as modifiable as possible so as to incorporate changes in requirements specified by the end users at later stages too. Being able to modify the software as per requirements in a systematic and controlled manner in an extremely important part of the requirements engineering process.

2.1.2 Requirement Collection:

IDE : Integrated Development Environment

An IDE typically contains a code editor, a compiler or interpreter, and a debugger, accessed through a single graphical user interface (GUI). The user writes and edits source code in the code editor. The compiler translates the source code into a readable language that is executable for a computer. And the debugger tests the software to solve any issues or bugs.

Database:

A database is a collection of information that is organized so that it can be easily accessed, managed and updated. Computer databases typically contain aggregations of data records or files, containing information about sales transactions or interactions with specific customers.

SDK Software Development Kit:

A software development kit (SDK) is a collection of software development tools in one installable package. They ease creation of applications by having compiler, debugger and perhaps a software framework. They are normally specific to a hardware platform and operating systems combination.

2.1.3 Programming Language:

A programming language is a formal language, which comprises a set of instructions that produce various kinds of output. Programming languages are used in computer programming to implement algorithms. Most programming languages consist of instructions for computers.

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

2.1.4Functional Requirements:

• Application can be run on the wifi or cellular network.

• Firebase can be used to store the login data of customers.

• There should be a customer service section for feedback

• Details of all goods and products must be correct and both must be registered against unique id.

• We must have an Admin(manager) panel which manages the whole system.

• The system shall record registrations and members detail like- product name, price, barcode, id, weight, manufacturing date etc.

•The system shall have connected to the ewallet of the customer

2.1.5 Non-Functional Requirements:

It defines the needs in terms of performance, design constraints, standard compliance, reliability, availability, security, maintainability and portability.

- Performance requirements
- The load time for the user interface screen will take no longer than 2 seconds.
- The log in information will be verified within seconds.
- Design Constraints

The application management will be standalone running in windows or Mac OS environment. The system is developed using flutter and has an access to firebase.

- Standard compliance

The graphical user interface will have a consistent look and feel.

- Reliability

Specify the factors required to establish the required reliability of the software system at a time of delivery.

- Availability

The system is available all the time as per the user operation time. The administrator can access it anytime, anywhere.

- Security

Administrator or manager will be able to log in to the application System. It will have access to the whole system. Access to the various subsystems will be protected by a user login screen that requires a username and password.

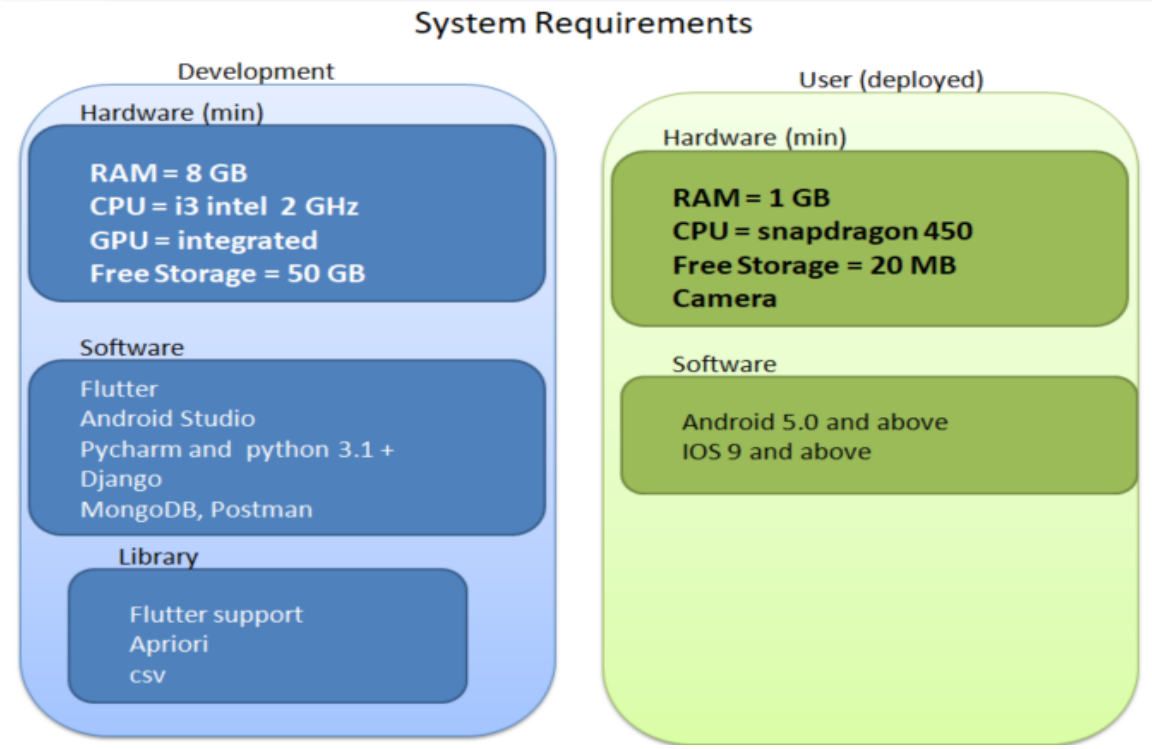
- Maintainability

The application is being developed in flutter. flutter is an open source UI software development kit by Google

- Portability

The application will run in any mobile having Microsoft windows 10 (32-bit or 64-bit), 64-bit is preferred/ MAC OS X 10.10 or higher, up to 10.13/10.14 that contains JAVA runtime and firebase access database.

2.2 REQUIRED RESOURCES



2.2.1 FOR DEVELOPMENT-

- HARDWARE
  - RAM = 8 GB
  - CPU = i3 Intel 2 GHz
  - GPU = integrated
  - Free Storage = 50 GB
- SOFTWARE
  - Flutter
  - Android Studio
  - Pycharm and python 3.1 +
  - Django
  - MongoDB, Postman

2.2.2 FOR USERS-

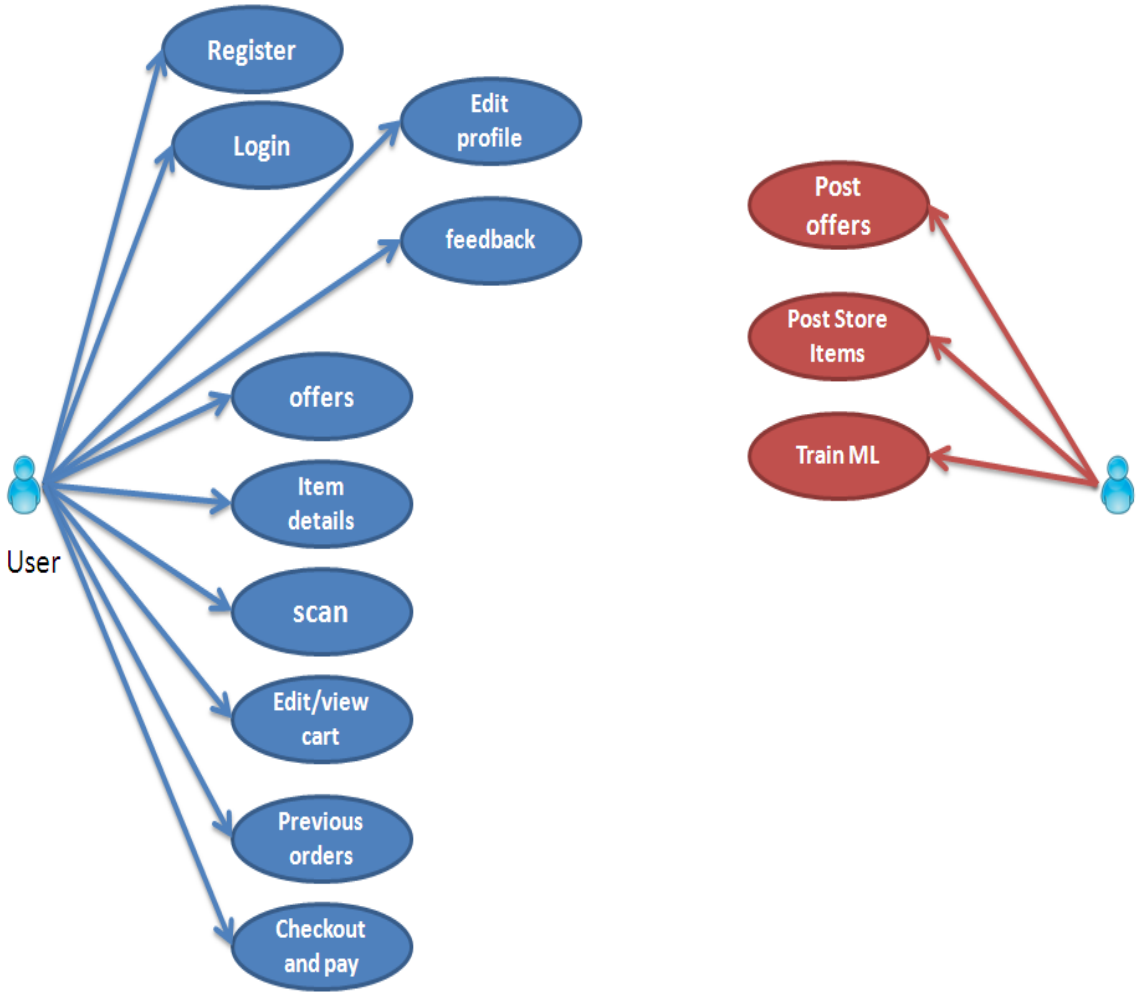
- HARDWARE
  - RAM = 1 GB
  - CPU = snapdragon 450
  - Free Storage = 20 MB
  - Camera
- SOFTWARE
  - Android 5.0 and above
  - IOS 9 and above

Chapter 3

Analysis & Design

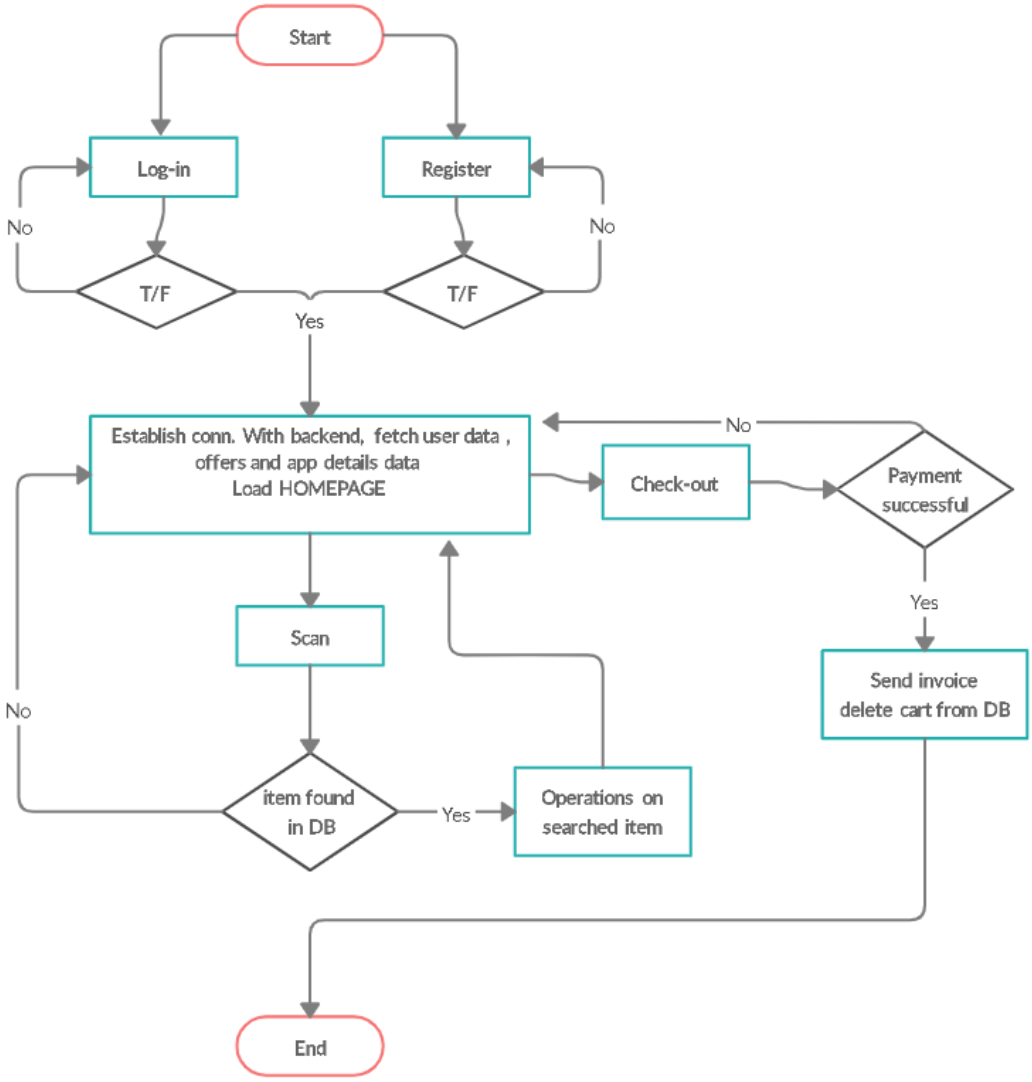
3.1 Use-case Diagrams

ACTORS = User and Shop owner



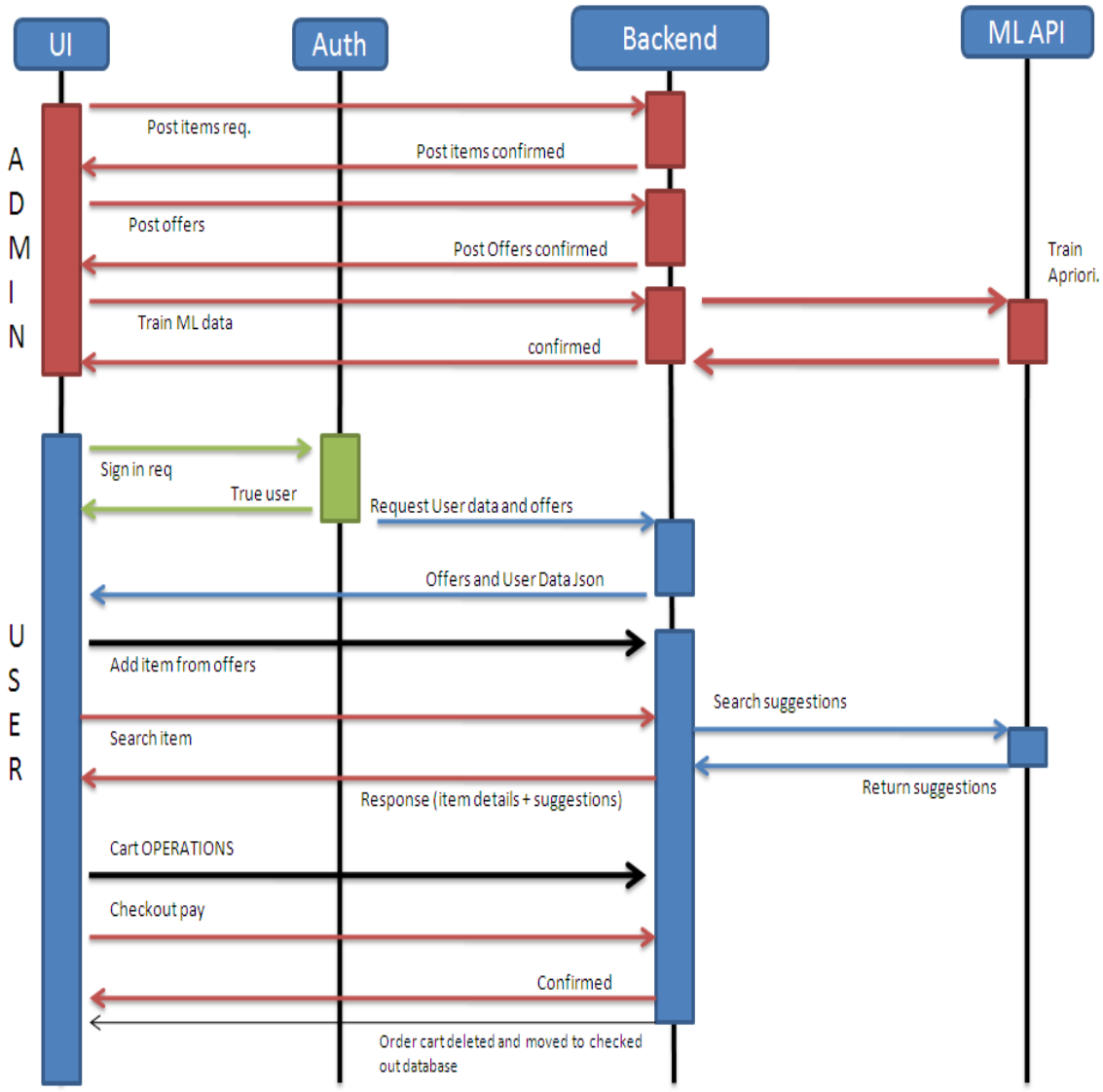
3.3 Activity Diagrams

Activity diagram is another important diagram in UML to describe the dynamic aspects of the system. Activity diagram is basically a flowchart to represent the flow from one activity to another activity.



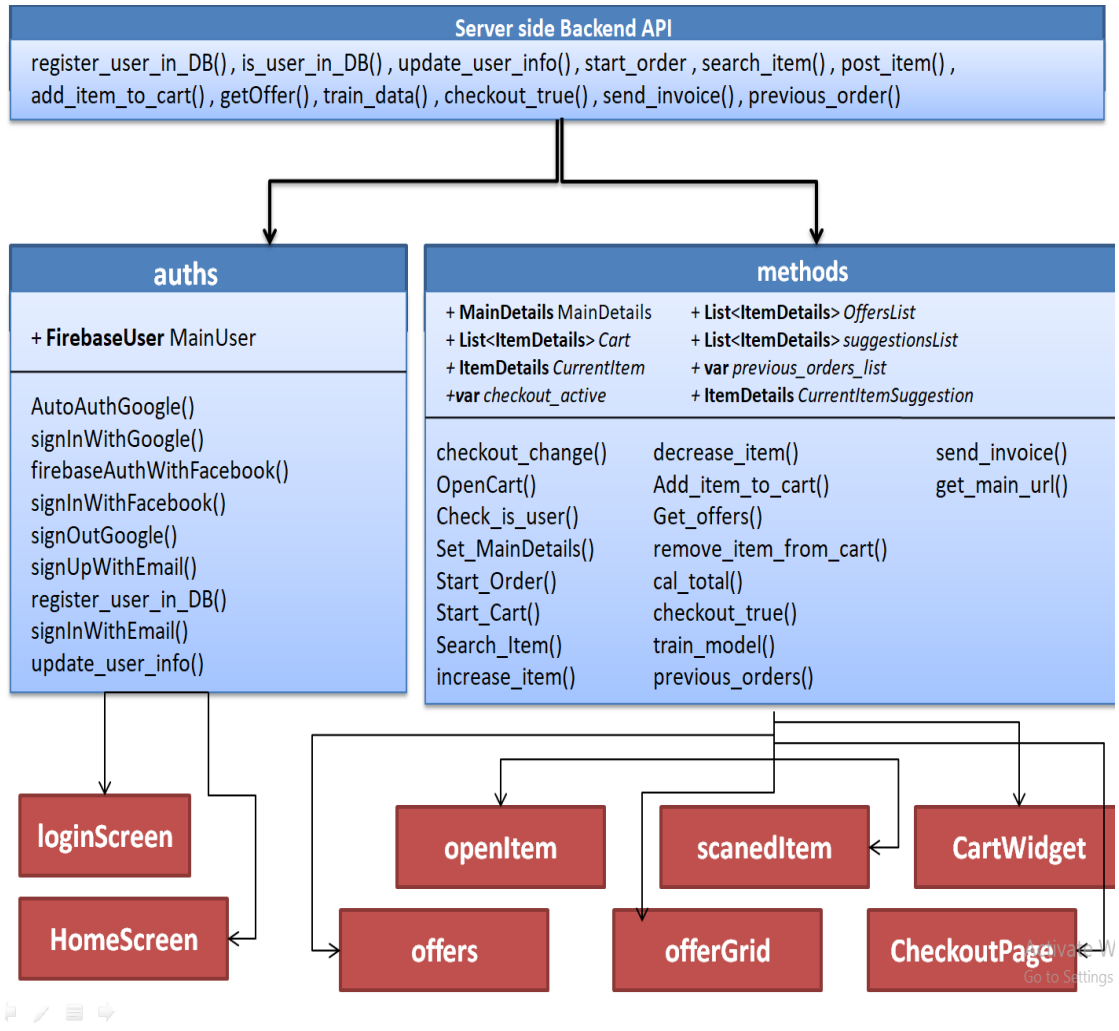
3.4 Sequence Diagrams

A sequence diagram simply depicts interaction between objects in a sequential order i.e. the order in which these interactions take place. We can also use the terms event diagrams or event scenarios to refer to a sequence diagram.



3.5 Class Diagram

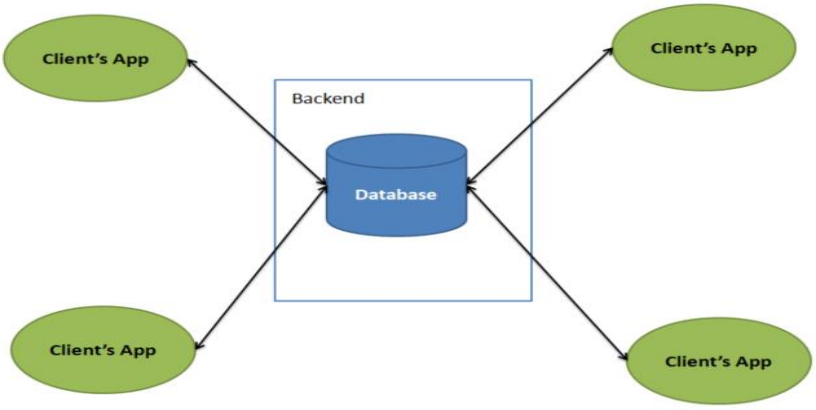
Class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing, and documenting different aspects of a system but also for constructing executable code of the software application.



3.6 Data Design

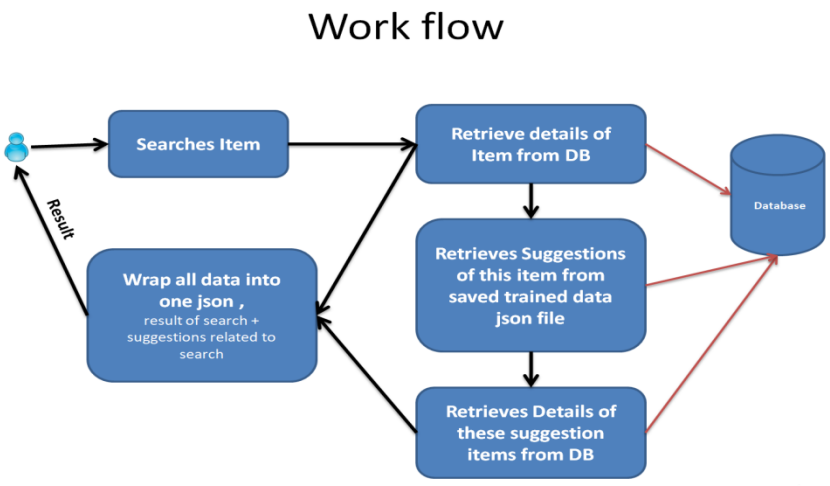
Data centered architectures

A data store will reside at the center of this architecture and is accessed frequently by the other components that update, add, delete or modify the data present within the store



Data flow architectures

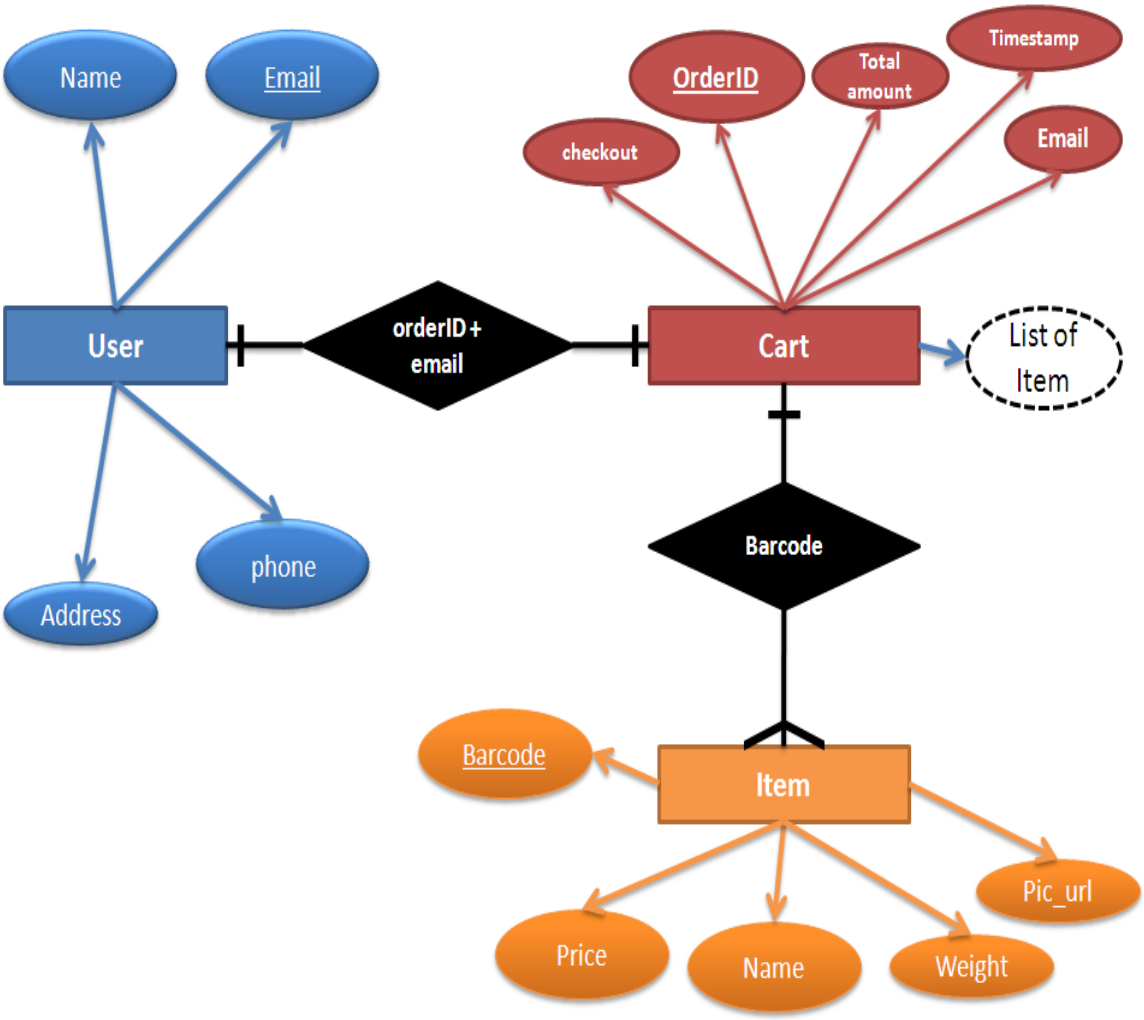
This kind of architecture is used when input data to be transformed into output data through a series of computational manipulative components



3.6.1 Schema Definitions

A database schema is the skeleton structure that represents the logical view of the entire database. It defines how the data is organized and how the relations among them are associated.

In this project, we have use **NoSql** database which works on JSON objects



3.6.2 Integrity Constraints

Integrity constraints are a set of rules. It is used to maintain the quality of information. Integrity constraints ensure that the data insertion, updating, and other processes have to be performed in such a way that data integrity is not affected

Entity constraint

- USER OBJECT
    - Email, Name, phone -> NOT NULL
    - Email -> primary key
- CART OBJECT
    - OrderID, checkout , total amount ,timestamp, email -> NOT NULL
    - OrderID -> primary key
- ITEM OBJECT
    - Barcode, price, name , pic_url -> NOT NULL
    - Barcode -> primary key

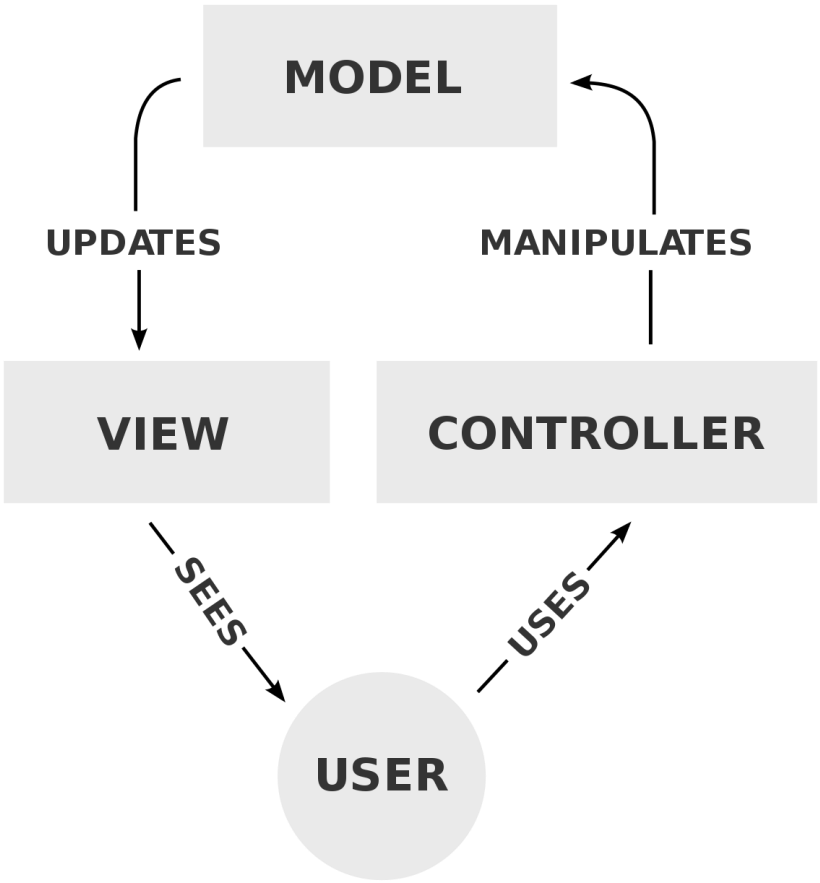
Domain constraint

- USER OBJECT
    - Email, Name -> (a-z)(A-z)(special chars)(0-9)
    - phone -> (0-9) length 10
- CART OBJECT
    - OrderID -> Unique key format
    - checkout -> true/false
    - total amount -> (0-9) (\.)
    - timestamp, -> (timestamp format)
    - email -> (a-z)(A-z)(special chars)(0-9)
    - OrderID -> (a-z)(A-z)(special chars)(0-9)

3.7 System Architecture

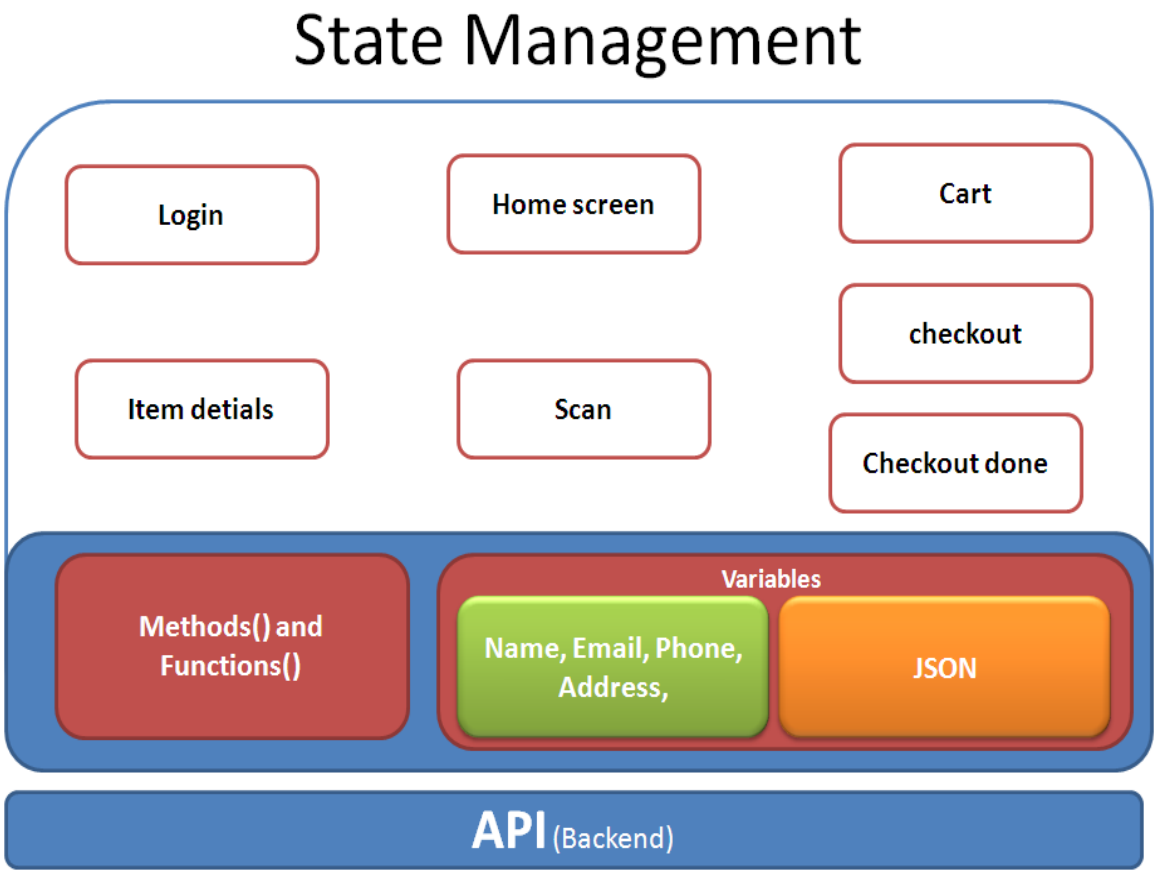
Architecture used = **MVC**

The Model-View-Controller (MVC) is an architectural pattern that separates an application into three main logical components: the model, the view, and the controller. Each of these components are built to handle specific development aspects of an application



State management

In order to overcome these limitations and provide a MVC architect to your app, there are different State management techniques available in Flutter. Some of the common approaches are BLoC Architecture, MobX, Scoped Model, Redux.



CHAPTER 4

Construction

4.1 Implementation

There are a variety of options that a project manager could consider when implementing a solution. There are advantages and disadvantages to each type, and The choice usually depends on the client organizational setup and the complexity of the solution to be implemented. For example, an international client with multiple offices needs to upgrade a certain email system in all offices by a certain “go-live” date. In such a scenario, a project manager is faced with huge logistical and technical challenges, and the implementation strategy is pivotal in deciding on the rollout. These implementation choices available to a project manager are:

1. Parallel implementation
2. Phase Implementation
3. Crash implementation

Parallel Implementation: A parallel implementation or approach implies that a new solution is implemented parallel to the current operating system in use. Those who are using the system will not see major downtime once it is implemented. The trick here is to implement the system. Once the new solution is tested and up and running, it is “switched” on and the older version is “switched” off. The advantages with a parallel implementation include (1) less disruption to the business and (2) no loss of business if the new system suddenly fails.

Phase Approach: Sometimes trying to implement a solution all at once is not feasible because many clients have essential operations that run during normal working hours and cannot afford the luxury of having their entire operation close down for a lengthy period in time. Often, clients have front office staff that attend to these operations (such as call centers, help desks, etc.), and they work in 24-hour shifts. This is why many clients approve of a phased implementation approach, and the project team must ensure that the phased implementation is possible. This approach involves implementing the solution to a certain amount of users and then rolling them onto the new solution, while the rest of the users 14 are rolled out in a similar fashion until the

entire solution is rolled out within the client environment. The phase approach works well because

(1) there is minimal disruption to the client's operation, and

(2) problems are resolved quickly.

The phased approach could also be used if there is more than one department. The project manager could decide that implementing the solution in one department at a time could be more reliable than trying to roll out all departments at the same time.

Crash Implementation: Careful planning needs to take place when considering a crash (also known as full blown) implementation. It takes an incredible amount of planning and re-planning to ensure no problems arise. In fact, with this type of implementation, the necessary contingencies need to be prepared and reviewed well in advance of the actual implementation, in order to minimize any potential failure. The necessary IT support staff also needs to be available on the chosen implementation period. A full-blown implementation should be scheduled to take place over a slow period, such as a holiday or weekend.

4.1.1 Implementation Details

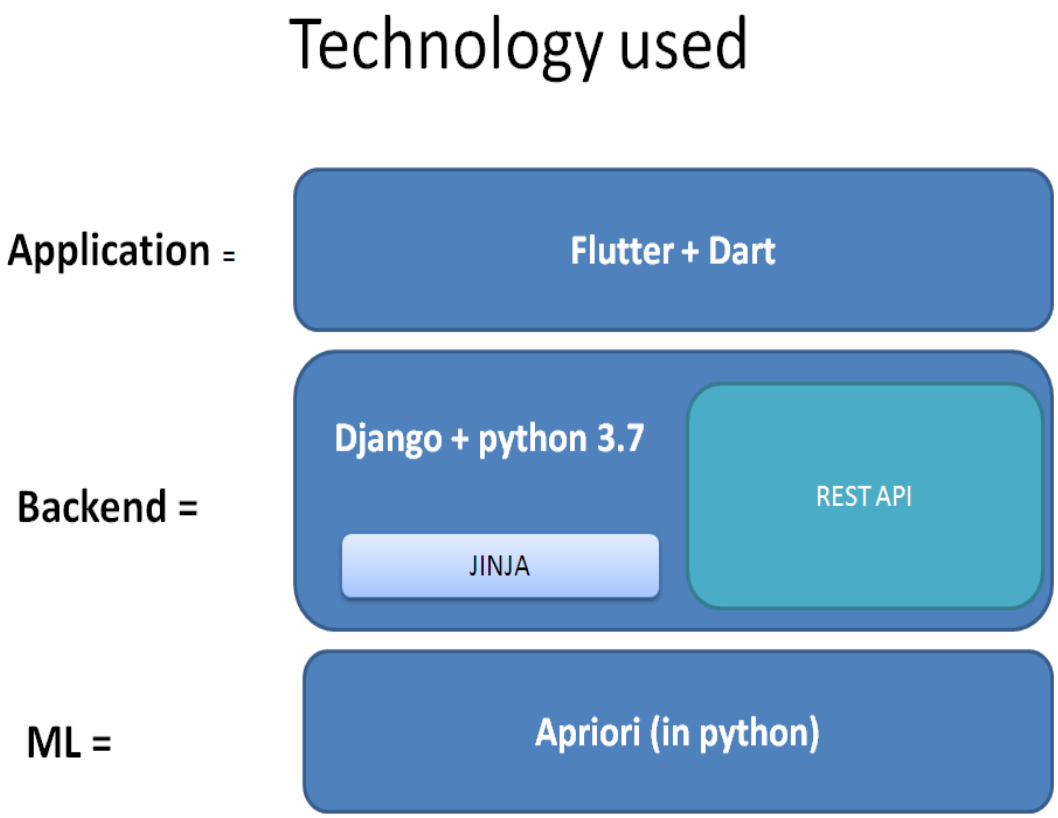
Front End Software Requirement

- Flutter framework + Dart
- Android studio
- JDK 7+, JRE, Xcodes runner

Backend Software details

- Pycharm + python 3.6
- MongoDB
- Postman
- Django

4.1.1.1 Software Details



4.1.1.2 Hardware Details

Hardware Required for Implementation:-

- RAM = 8 GB
- CPU = i3 intel 2 GHz
- GPU = integrated
- Free Storag = 50 GB

Hardware Requirement for Deployment:-

- **Device**
  - RAM = 1 GB
  - CPU = snapdragon 450
  - Free Storage = 20 MB
  - Camera
- **Server**
  - RAM = 1 GB
  - CPU = i3 Intel
  - Free storage = 200 GB initially

4.2 Testing

4.2.1 White Box Testing

White box testing is a testing technique that examines the program structure and derives test data from the program logic/code. The other names of glass box testing are clear box testing, open box testing, logic driven testing or path driven testing or structural testing.

Test Case 1: Login

Test Case ID	Input Data	Output	Result
ID01	email:example@g.com password:qweqwe	login successful	Working Correct
ID02	email:example -g.com password:qweqwe	Error/ email not found/ email not correct	Working Correct

Test Case 2 : Register

Test Case ID	Input Data	Output	Result
ID01	email:example@g.com password:qweqwe name:example name phone:9988998877 address: exm address	Register successful	Working Correct

ID02	email:example @g.com password:qweqwe	Email already exists	Working Correct
ID03	email:example2@g.com password:qweqwe name:example name phone:879876 address: exm address	Error / not a valid phone number	Working Correct
ID04	email:example3@g.com password:qwe name:example name phone:8798769898 address: exm address	Error/ password should be at least 6 character	Working Correct

4.2.2 Black Box Testing

Black Box Testing, also known as Behavior Testing, is a software testing method in which the internal structure/ design/ implementation of the item being tested is not known to the tester. These tests can be functional or non-functional, though usually functional. This method is named so because the software program, in the eyes of the tester, is like a black box; inside which one cannot see. This method attempts to find errors in the following categories 1. Incorrect or missing functions 2. Interface Errors 3. Errors in data structures or external database access 4. Behavior or performance errors 5. Initialization and termination errors The testing of Android Mobile application is generally done inside the development tools. Initially emulators are used for this and final testing is done with hardware devices. However, for this application the development and testing is extended out on the specific hardware model. Itis Essential To Have Android device embedded in the hardware model.

Conclusion & Future Works

The problem with the existing system is that supermarkets and shops can't provide convenience to the customer, whether it is about the products or any other services. This idea can be deployed in the long term future prospective. This idea can also grow very well in the market as it increases the ease of customers and it is completely free. Interface is exciting and user acceptable. There will be no tension of the billing queue and apart from this so much of time will be saved . The product reach would be spread to all customers who are struggling to bill and pay for their items. We tend to create a better shopping environment for the customers and sellers. An improvement over the existing system is by developing something which can help in checkout and which is easy to handle. This app compacts features for the stores too, to advertise their products on the app.

Future work:

There are lots of different areas in this project which can be enhanced and improved in future while adding constant new features to the app. some of the future goals of this application can be.

1) providing automated scheduling of orders from home based on users past order with the help of ML.
2) adding other features like object detection if barcode is not scannable for some reason.
3) adding sentimental analysis on the feedback of the customers.

Appendix A

Snapshots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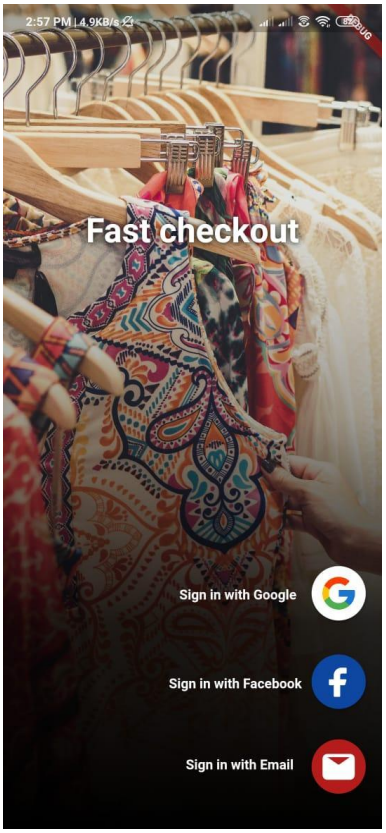
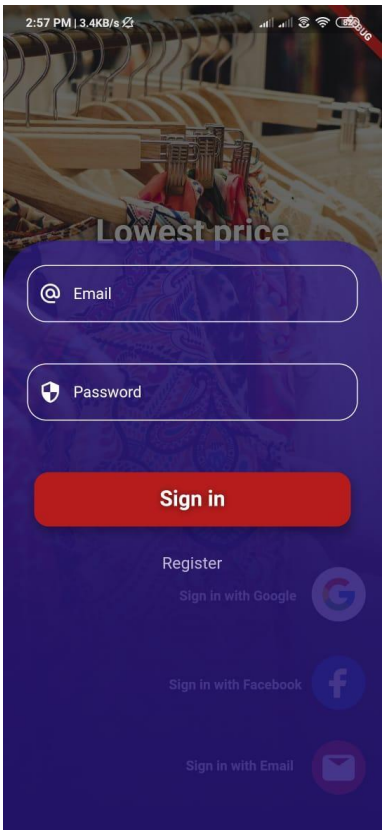
PEW PEW!
minor2


2:57 PM | 4.6KB/s
HAKUNA matata
Get Started


2:57 PM | 4.9KB/s
Fast checkout
Sign in with Google
Sign in with Facebook
Sign in with Email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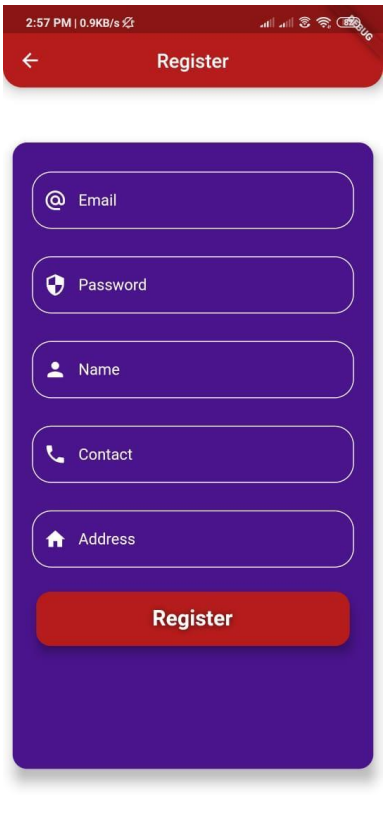
Lowest price
Email
Password
Sign in
Register
Sign in with Google
Sign in with Facebook
Sign in with Email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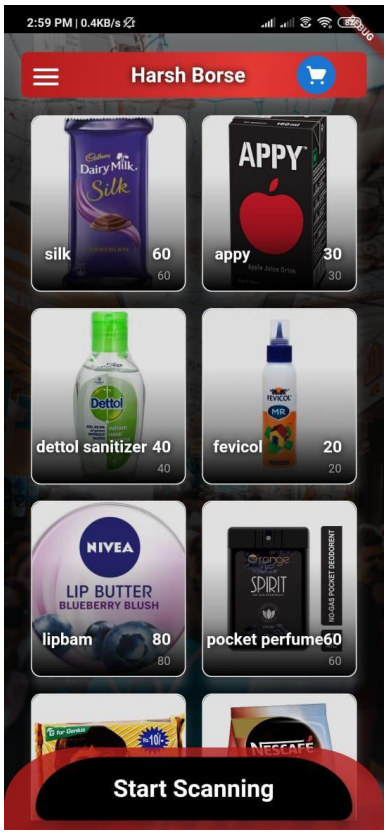
Password
Name
Contact
Address
Register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Harsh Borse
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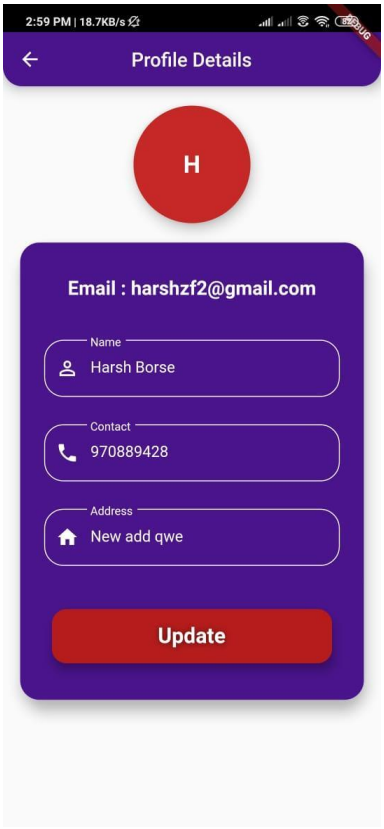
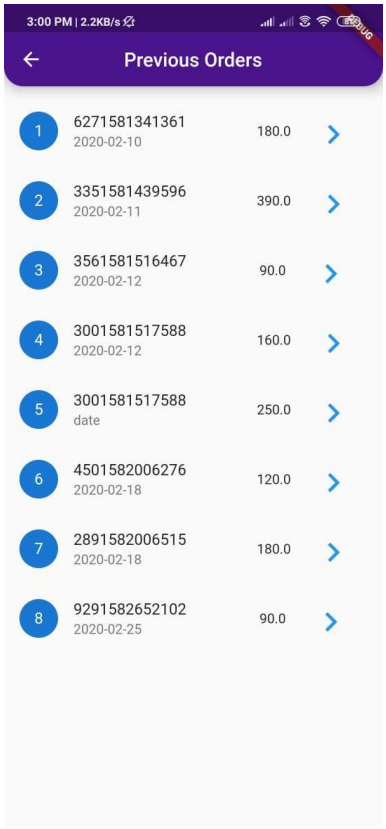
dettol sanitizer 40
fevicol 20
lipbam 80
pocket perfume60
Start Scanning


2:59 PM | 18.7KB/s
Profile Details
H
Email : harshzf2@gmail.com
Name
Harsh Borse
Contact
970889428
Address
New add qwe
Update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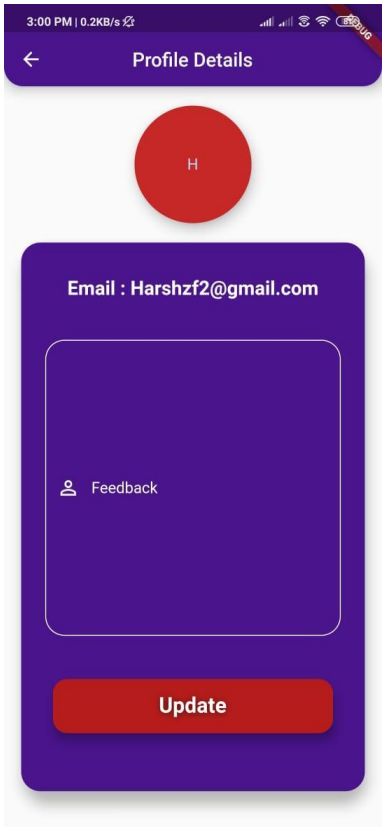
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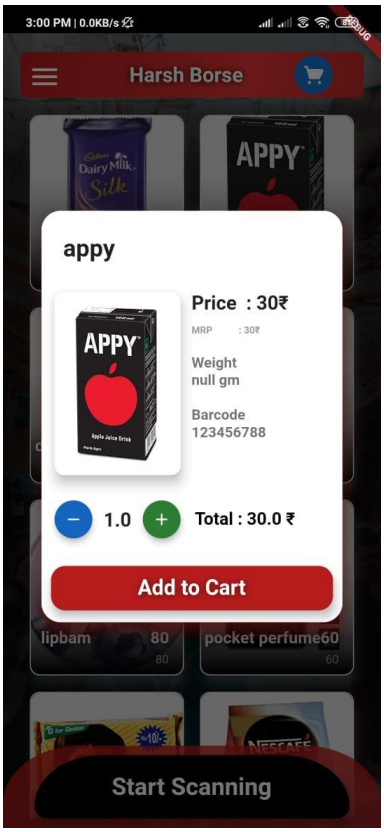
Profile Details
H
Email : Harshzf2@gmail.com
Feedback
Update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Harsh Borse
appy
Price : 30₹
MRP : 30₹
Weight
null gm
Barcode
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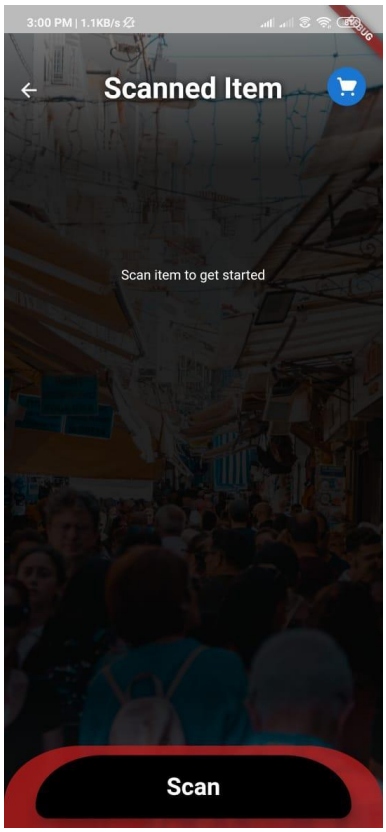
Total : 30.0 ₹
Add to Cart
lipbam 80
pocket perfume60
Start Scanning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Scan item to get started
Scan


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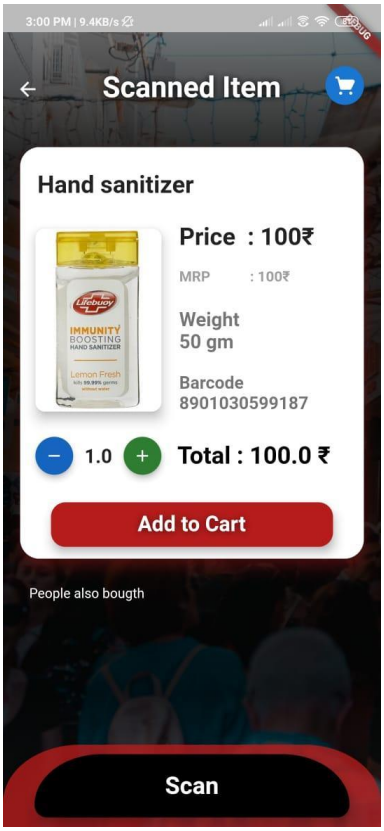
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Scanned Item
Hand sanitizer
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MRP : 100₹
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50 gm
Barcode
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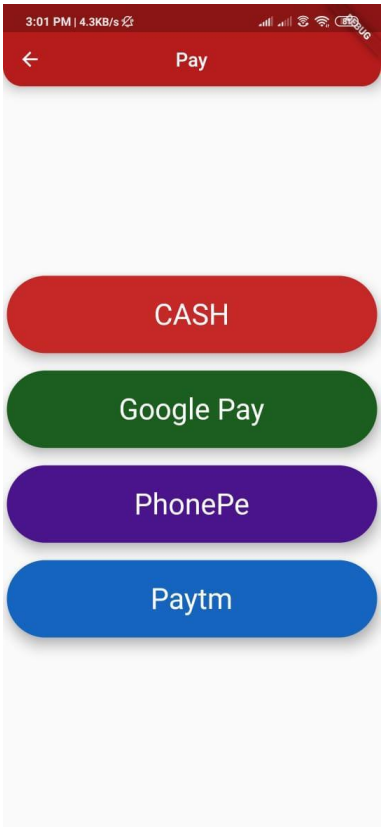
Total : 100.0 ₹
Add to Cart
People also bougth
Scan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Pay
CASH
Google Pay
PhonePe
Paytm


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Pay
Thanks For Shopping with us
A1234567890A
2
Item(s) in Cart
Show Cart

References

https://medium.com/analytics-vidhya/recommendation-system-a4ebaa47cf0b

https://flutter.dev/

https://www.kaggle.com/xvivancos/market-basket-analysis

https://www.edureka.co/