Interior Designing Application

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COMSATS UNIVERSITY ISLAMABAD,

ATTOCK CAMPUS – PAKISTAN

SESSION 2017-2021

Interior Designing Application

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A DISSERTATION SUBMITTED AS A PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING

DEPARTMENT OF COMPUTER SCIENCES

COMSATS UNIVERSITY ISLAMABAD,

ATTOCK CAMPUS – PAKISTAN

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FINAL APPROVAL

Certified that we have read this project report submitted by Ammara Sajjad and Syeda Masooma Zehra and it is, in our judgment, of sufficient standard to warrant its acceptance by Department of Computer Science, COMSATS University Islamabad, Attock Campus, for the Bachelor of Science in Computer Science.

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ABSTRACT

The project intends to design an Android application for Interior designing. It focuses on all types of events. Customer can easily choose their particular event like Offices, Restaurants, and Hotels decoration. Customers have the leverage to choose their specific teams according to their working capability by rating. These teams will be working under an administrator. Customer can also give feedback about the performance of a team. According to customer requirements variety of pictures will be displayed through artificial intelligence. An estimated bill will be generated according to customer design and he can book or cancel an order in a specific time period.

This project is about Interior Designing that provide lots of facilities to the customers. Regarding designing of interior we want to use it as online Android application for different events designing. In real life there are few zones where people are not able to design their events so they can take help from this interior designing tool. By using this Android application, we provide easiness through different teams to manage events of people of different areas. In this project we are using machine learning for the security of team's member in profile management by fingerprint recognition. Recommendation of all services related to events or designing (like catering or decoration items).

We are using image processing to change the interior according to user needs. Application give suggestions of different themes, color scheming and also communicate through Chatbot.

Acknowledgement

All praise is to Almighty Allah who bestowed upon us a minute portion of His boundless knowledge by virtue of which we were able to accomplish this challenging task.

We are greatly indebted to our project supervisor “Yasir Ali Shah”. Without their personal supervision, advice and valuable guidance, completion of this project would have been doubtful. We are deeply indebted to him for his encouragement and continual help during this work.

And we are also thankful to our parents and family who have been a constant source of encouragement for us and brought us the values of honesty & hard work.

Ammara Sajjad

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Chapter 01

Introduction

1.1 Brief

Every individual want a better place having best locality for living or for any other commercial work. But they don't really ponder interior design to be all that important. There are some people who want to decorate and make their place colorful according to their choice.

This could be possible with the help of interior designers. As the interior designer can make any place remarkable as it is their career that gain creativity, technical know-how, industrial and professional skills on spacing, building, architecture and well-known to different human lifestyles.

Interior design is not just about the look and beauty, added to this it also has an ability to showcase any place as residence or commercial place according to customer's demand with proper design and comfort lighting. To be more precise, it is all about transforming people lives according to their dreams and makes their life better one by the facility of good interior design.

Interior design is much important than it seems so in this regard the techniques like image processing, recommendations for designing is to provide a platform where user can customize according to their choice. The one advantage by having best interior design is that user can bring its dream place alive. Another benefit is to have a better interior designed place is that it will fetch higher bids during the sale of that place (house, office or any building) than any other.

The application is an Android-based application for interior designing. This application will facilitate the customer while sitting at home with the best of interior designs, coloring scheme, and all the other services regarding decoration and design.

1.2 Relevance to Course Modules

It has three main modules:

1.2.1 Fingerprint Recognition

It is the machine learning module for the security of team member's while login.

1.2.2 Chatbot

It is the artificial intelligence module that provides the facility of chatting to the customer about any query or details of further requirements.

1.2.3 Image Processing

It provides real look and feel (real environment) by providing customization option to be customized by customer according to their need.

1.3 Project Background

As there are hardly few websites or apps that provide interior designing. People who are unable to décor their houses, offices and any other residential or commercial place require such an app by which they make their dream place alive. Such people have large places but they don't know how to manage the space and make it more presentable.

Interior designing is used to help those people that are unable to decorate their home. The main goal of interior designing is to improve the user experience by providing efficient solution for a better use of space available in intervened environment. Fundamentally, it is a way to change the lives of people who live or enjoy a certain space, improving their quality of life in this through design and decoration.

Different designing techniques are proposed in the literature: wall decoration, color scheme, different themes, provide real environment by customization. This was the motivation for us to provide a platform where user customize their places according to their desire and needs. After listening the needs from customer, the interior designing teams evaluates in a way that reflects on option that optimize its use, that based on what customer want for each division.

1.4 Literature Review

Some of other applications are develop that provides the same features which include color scheming, different themes recommendations, real environment for customization to facilitate the user but our application will provide some other feature along these that we are providing different teams from where the user can choose their team according to their work, expenditure, rating etc. Along this our application provide some other features like Chatbot, Fingerprint recognition for the security of team's members that make it unique from present applications.

1.5 Analysis from Literature Review

To develop an application, which is faster easy to use, simple, handy, effective and advanced application that is time saving and made an ease for user in every aspect to increase the user's interest towards interior designing.

To overcome the problem of those people that are unable to decorate but have some dreams for their places for this they collaborate and connect with different service providers like painters, carpenters and architect to get the work done.

So we developed an android based application which help user by providing all features like furniture, color scheming, and other services at one platform and our main challenge is to achieve client goals on time, under budget and up to the expectation.

There are other applications too like "Traci Connell Design Delivered" which offers everything from furnishings and a remodel online design option. This application has some features that our application contains but our application is different because it offers lots of services to its user by gathering the requirements of user. Some sample pictures will be presented according to customer design. It provides different categories of events by which customer can effortlessly select their particular type of event.

1.6 Methodology and Software Lifecycle for this Project

- We would be using Incremental Model because Requirements of Software are first broken down into several modules that can be incrementally constructed and delivered. Therefore, it is easier to modify the version as per the need of the customer.

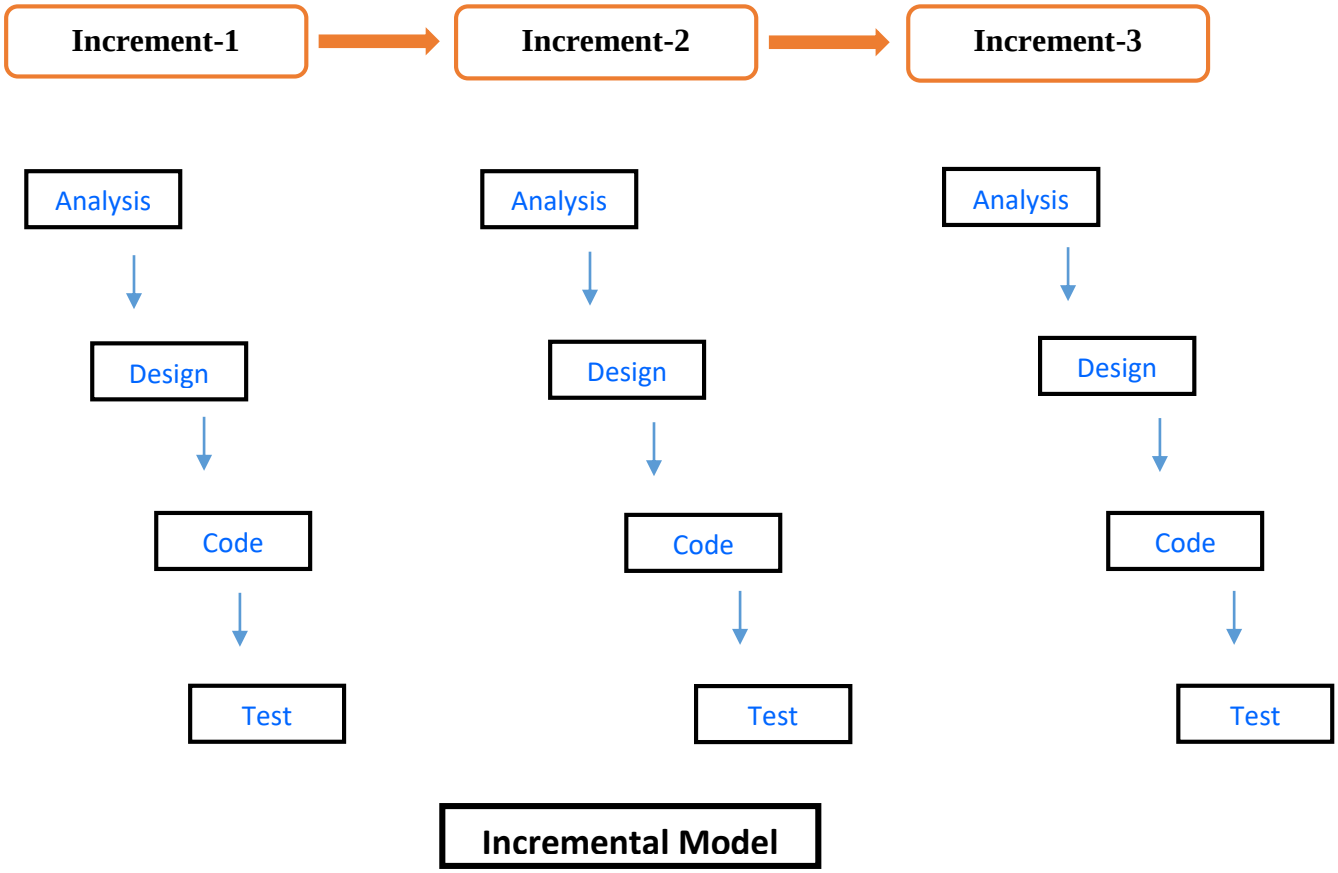

Figure 1.1 Incremental Model

- Once the core features are fully developed, then these are refined to increase levels of capabilities by adding new functions in successive versions. Each incremental version is usually developed using an iterative waterfall model of development.

1.6.1 Rationale behind Selected Methodology

- We select this methodology because our requirements are clear so through this the development will be fast and features will be added in a systematic way.
- In this methodology we will develop application through repetitive increments that in first increment we will develop interface in second increment we will add functionalities that a system will perform.

Chapter 2

Problem Definition

2.1 Problem Statement

As the time passes, the life becomes too difficult, and the busy schedules of every person around the world, that's why many people are not sure that how can they arrange their events. In this era, everyone are getting more dependent on technology like android applications given an extraordinary features and easiness to their users in just a cell phone.

Our main focus is that, we have to create an interior designing android application that provides those features to the android users that reflects the real environment. In Pakistan, we've researched that there are no applications for users to interior their living places and also provide an existent atmosphere. That's why we have to provide a platform for those users who wants to design their places by choosing best and trustable resource

2.2 Deliverables

- **Android Application**

  Provides an interface for the android users for the existing features and in what way the application alike.

- **Image Processing**

  The system should recommend and allow the user to add color scheme to feel the real environment by providing the option of picture uploading.

- **Recommendation System**

  This project is that to provide the recommendation of various themes to be search from internet on the basis of the history of the user.

- **Virtual Chatbot**

  For an effective communication with the user.

- **Ensure Security**

  To provide security to the team members through fingerprint recognition.

- **Project Report**

  A complete Project Report that includes Software Requirements Specification, Software Design Specification, GUI Mockups, Test Cases, and other major tasks that we have to perform.

2.3 Development Requirements

There have following requirements for the users of this android application in the perspective of how can they run the application in their systems (PC's and Android Cell Phones).

- **Operating System Requirements**

  Android devices

- **Application Requirements**

  Android Studio

- **Other requirements**

  Figma, MS word, PowerPoint for the mockups, designing and presentation.

2.4 Current Interior Designing Applications

Here we have many current application of interior designing:

2.4.1 PFuner E-Design Services

This application provides following features:

- It offers online interior design services
- It provides the affordable alternate to the traditional interior design
- Users can communicate through email

Figure 2.1

Major drawback of this application is that, it doesn't provide a real environment for their users.

2.4.2 Houzz Online Interior Design AR Tool

Houzz online interior design AR tool gives many features to facilitate their users but main service is:

- It offer a new augmented reality tool that lets client try on feature from their catalog before purchasing

One limitation is that it doesn't allow clients to view two or more items to scale at once. As a result, it may be difficult to create a whole room design from scratch.

2.4.3 Traci Connell Design Delivered

This interior designing android application main focus is that, to get information from the user and create a dream space for them. It provides many services like:

- Commercial and Residential Projects
- Custom Furniture and Cabinetry Designs
- Interior Space Planning and Furniture Layouts
- Interior Construction Design
- Color Consultations
- Online Design Services
- Renovation Contracting.

2.5 Relation with Pfuner, Houzz and Traci Connell

Our project is based on many useful services, basically all the above current applications main focus is that to provide an online platform for the customer. So, our main motive is that to provide an online application with real environment and also end-to-end communication. Interior designing android application related with them in this way:

- A virtual chat bot will be provided to communicate with customer.

- Another main objective of this project is that to provide the recommendation of various themes to be search from internet on the basis of the history of the user.
- By image processing, the system should recommend and allow the user to add color scheme to feel the real environment by providing the option of picture uploading.

Traci Connell, ask their customers to fill out a short questionnaire, they communicate with their customers through email. On the other hand, we provide a Chatbot that gives more fast communication with our users/customers. User can choose color themes, and also apply them at that time. We also provide a platform, in which user can easily buy items/products for every type of events like Traci Connell.

Pfuner, it doesn't provide an effective communication, as we all know that in this era email is not more effective communication type. So here we have, more focus on communication, that's why customer can easily explain their requirements.

Our main focus is that, to enhance the features by adding more advanced features that gives all types of facility to our users at one platform. In this application, we provide security, an effective communication, color scheme, online shopping of different items according to events. Events means, to create an application which will assist in designing multiple categories of events in schools, conferences, house decoration, weddings or office work according to user profile and local environment. This project provide an effective feature i.e. image processing, which gives a real environment according to customer needs.

Chapter 03

Requirement Analysis

3.1 Use Case Diagram

We are going to discuss the interaction of different actors with the proposed application, and the functional and non-functional requirements of our application. Based on these functional and non-functional requirements, we will further develop our project. We will also create a use case diagram and a detail description of those use cases. It will provide interaction between the application and user of the application.

Figure 3.1 is the use case diagram of our android application. The user will phase two panels either as customer or as team. In Customer mode, user can use application after login and see user interface that include different services that application provides. In Team mode, user must be any team's member who can login through fingerprint for more security and then see the customer details. While the admin can see all the details related to application like feedback/rating of teams or customer details etc.

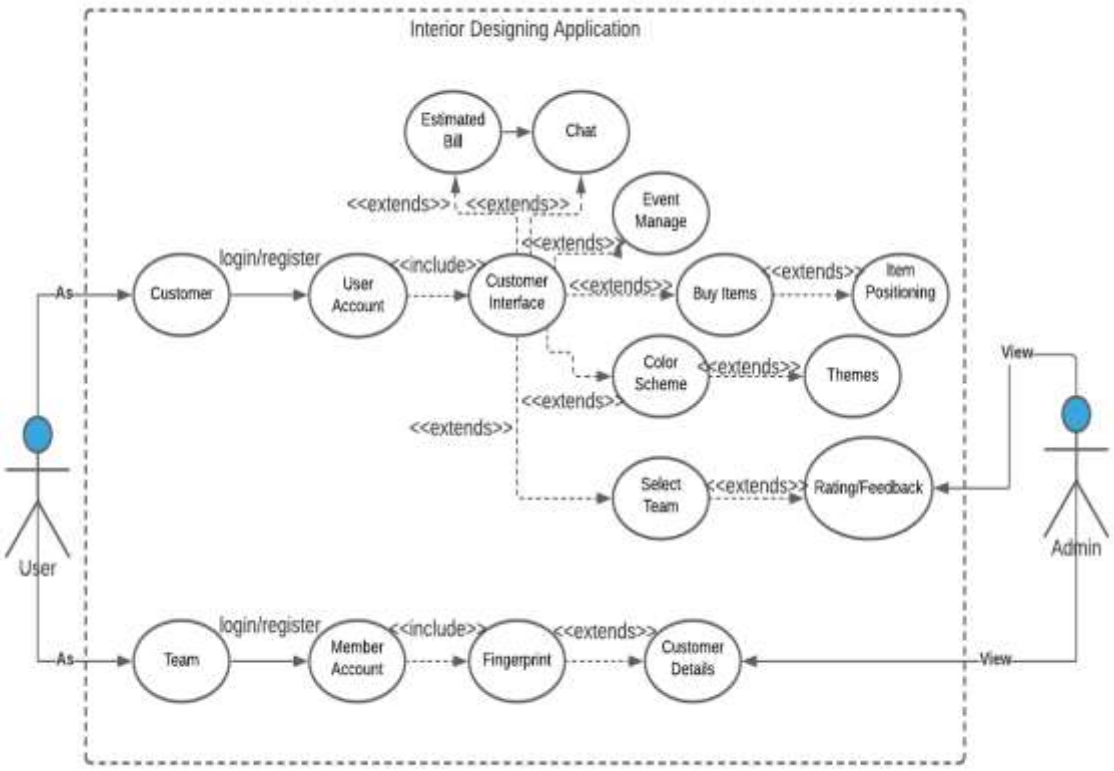

Figure 3.1 Use Case Diagram

3.2 Detailed Use Case

Use case name: Customer

Priority: 1

Actor: User

Summary: Customer mode allow the user to facilitate by different services of the application to decorate the places according to their choice after login.

Pre-condition: The user open the application and see two different panels/modes.

Post-condition: The user places the order and satisfied by their desired theme for their place.

Extends: None

Uses: Customer Interface.

Use case name: Team

Priority: 1

Actor: User

Summary: Take the user to the second panel/mode that includes customer details, order and feedback/rating given to different teams. Team member can login through fingerprint also for more security.

Pre-condition: The user open the application and see two different panels/mode.

Post-condition: The user is team member and can see all the details of customer related to their team.

Extends: None

Uses: Fingerprint

3.3 Functional Requirements

Functional requirements will tell us the behavior of our system functionalities and tasks that our system will perform. Functional requirements are those requirements that our application must have. The functional requirements of our application include Customer mode that consists of

customer interface having all the services and features provided by the application to facilitate their user and give feedback to their selected teams. Secondly Team mode that consists of security of team member's account through fingerprint recognition and then see all the details related to customer.

3.3.1 Customer Interface

Name	Customer Interface
Summary	This function provide different services to the user like estimated bill, chat with service providers, event management, buy different interior item and place them by customization option, apply multiple themes of different color scheme. Also select team that have high rating among others.
Rationale	Every user can easily access it and avail services after having account in this application.
Pre-Requisite	The user should make an account if not register. The user must login first and then see customer interface.

Table 3.1 Customer Interface

3.3.2 Image Processing

Name	Image Processing
Summary	This function will provide customization option to the user by which user can place different interior items according to their choice.
Rationale	User can easily customize like real environment.
Pre-Requisite	The user must login through user account. The user must select/buy some items for customization.

Table 3.2 Image Processing

3.3.3 Sample Pictures

Name	Sample Pictures
Summary	This function will provide different sample pictures like multiple themes of different color scheme through artificial intelligence.
Rationale	User can easily choose theme according to their choice and apply to their desired place to check real look and feel.
Pre-Requisite	The user must login through user account. The user should open sample pictures (themes) option.

Table 3.3 Sample Pictures

3.3.4 Fingerprint Recognition

Name	Fingerprint Recognition
Summary	This function will provide advance security to the team's member while login through machine learning.
Rationale	Team member can easily login by their fingerprint.
Pre-Requisite	The member should make an account if not register.

Table 3.4 Fingerprint Recognition

3.4 Non-Functional Requirements

Non-functional requirements are those requirements that specify the quality of the system. Following are the non-functional requirements of our application.

3.4.1 Efficiency

Our application will be much efficient so that it will provide different services, features and accurate amount of bill after placing an order.

3.4.2 Learnability

Our application will be efficient and easy to understand so that novice and expert both users can use it easily.

3.4.3 Robustness

Our application will be robust so that it can tolerate the faults. The system shall recover itself in less time if it is failed due to some external or internal issued.

3.4.4 Maintainability

Our application will be ready to maintain and update with time. Its component will be independent and can easily be maintained.

3.4.5 Reliability

Our application will recover itself in less time in case if it is failed due to some reasons. Our system will be reliable enough to use.

3.4.6 Usability

Our application will be user friendly and easy to use so that user will not face any kind of difficulty while using the application.

3.4.7 Availability

Our application is online Android application designed for this purpose that it will available to its users all the time and they can access it through online platform easily at any time to avail its services.

Chapter 4

Design and Architecture

4.1 System Architecture (Block Diagram)

Figure 4.1 shows the system architecture of our project. Our project on two modules i.e. users and teams. The users/customers directly interact with the interface. Firstly, they login into the system, then we have different features and facilities for the users. The recommendation system according to user details and previous history, then different samples of recent designs (related to inte. buying their favorite items for living places, Chatbot (to develop strong connection with the user so they can easily tell their needs and wants). To provide real environment for the users, they can also upload pictures, so they can easily see their real picture or design according to their demands. Here we are using image processing for this purpose.

Second module, teams, here we have three different teams which are divided according to their specialization, expenses, ratings and performance. They can login in the system through fingerprint recognition.

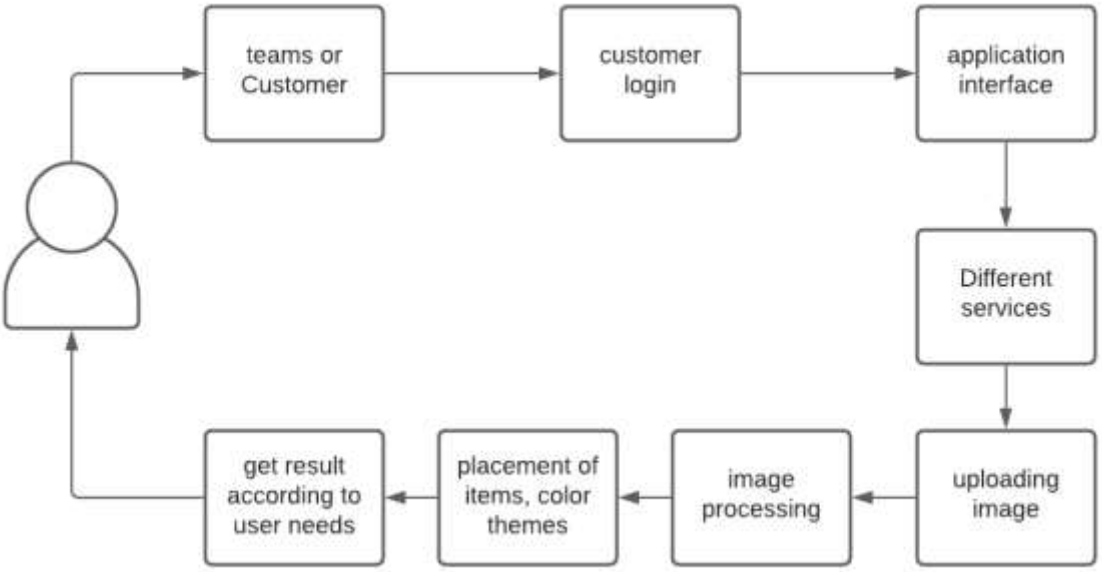

Figure 4.1 System Architecture

4.2 Class Diagram

Figure 4.2 shows the class diagram of our project, in this diagram we have different classes. Team, events, customer, items and order are classes in which they have different attributes and functions. This diagram also represent the relationship with other classes. Also we have public and private elements in it.

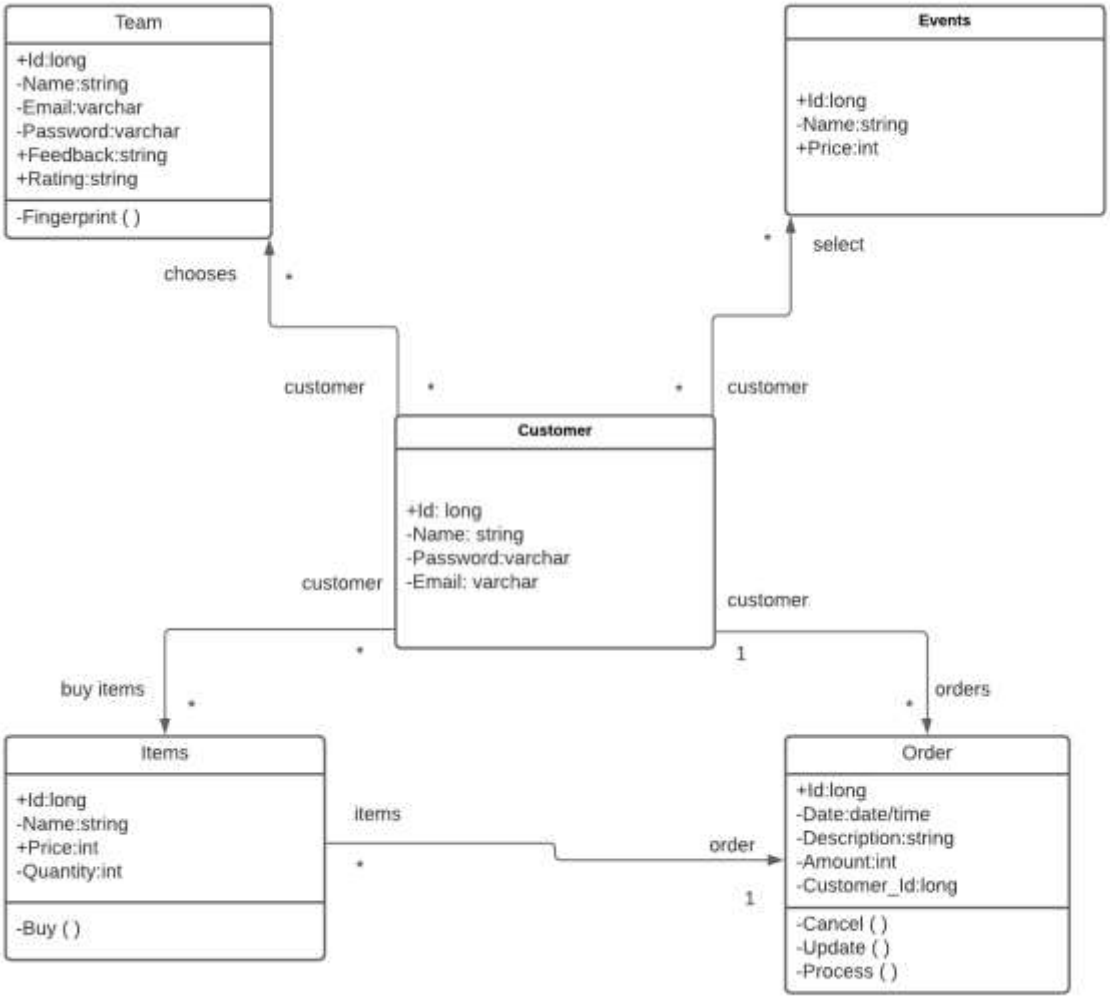

Figure 4.2 Class Diagram

4.3 Sequence Diagram

Figure 4.3 shows that the sequence diagram for the user module. User login to the application, verify the all information given by the user, if it exist in the database then after login user directly connected with the application.

Figure 4.4 shows sequence diagram of second module which is team. Team login in the system using fingerprint recognition. If fingerprint matches with existing database fingerprints, then team members can easily the access the application and can see all the details of customers.

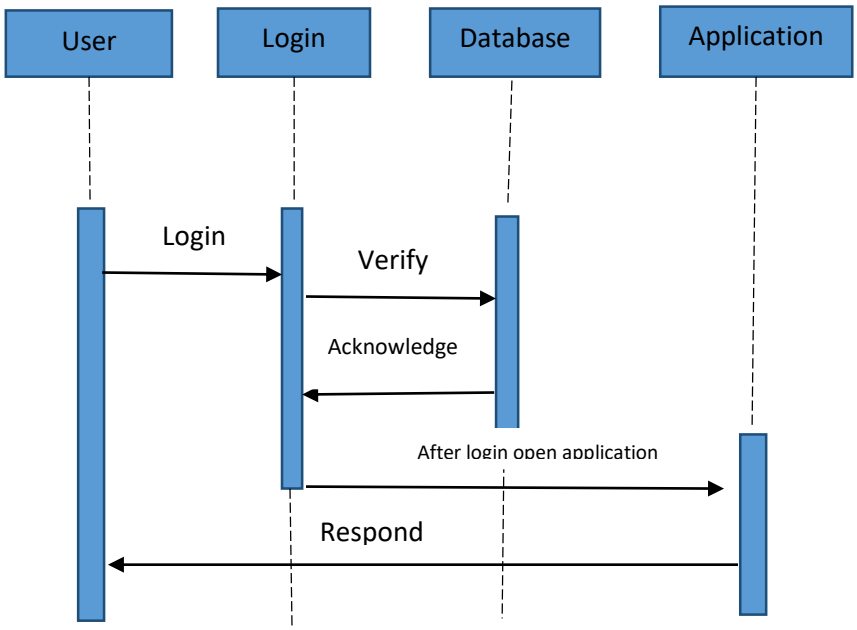

Figure 4.3 Sequence diagram for user

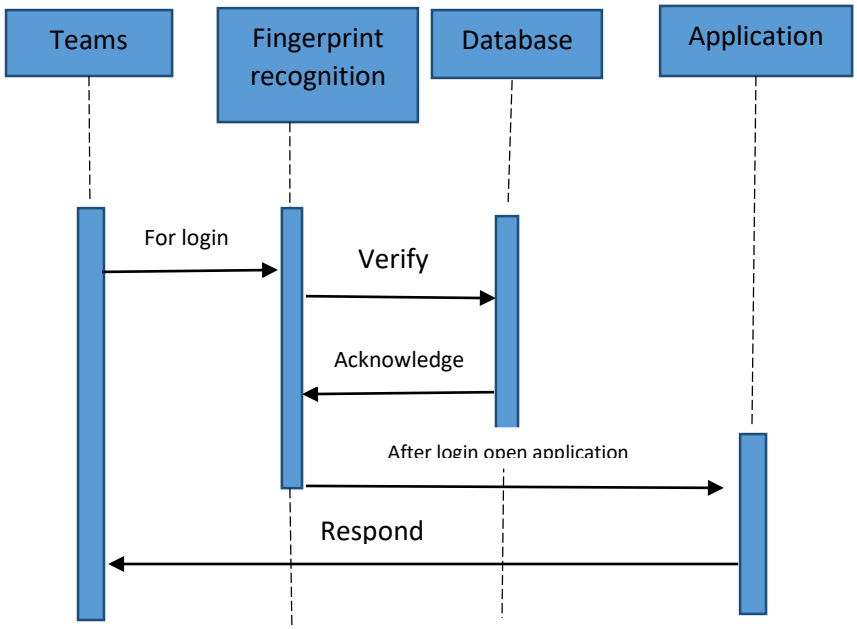

Figure 4.4 Sequence diagram for teams

4.4 Activity Diagram

Figure 4.5 shows the activity diagram of our, teams login through fingerprint recognition, then see all the details.

On the other hand, user login if exist then go to the application otherwise they have to registered themselves. Then they have many features, all the features are responsible to fulfill the requirements of the user. Using image processing, they can easily find their needs and fulfillment of their requirements.

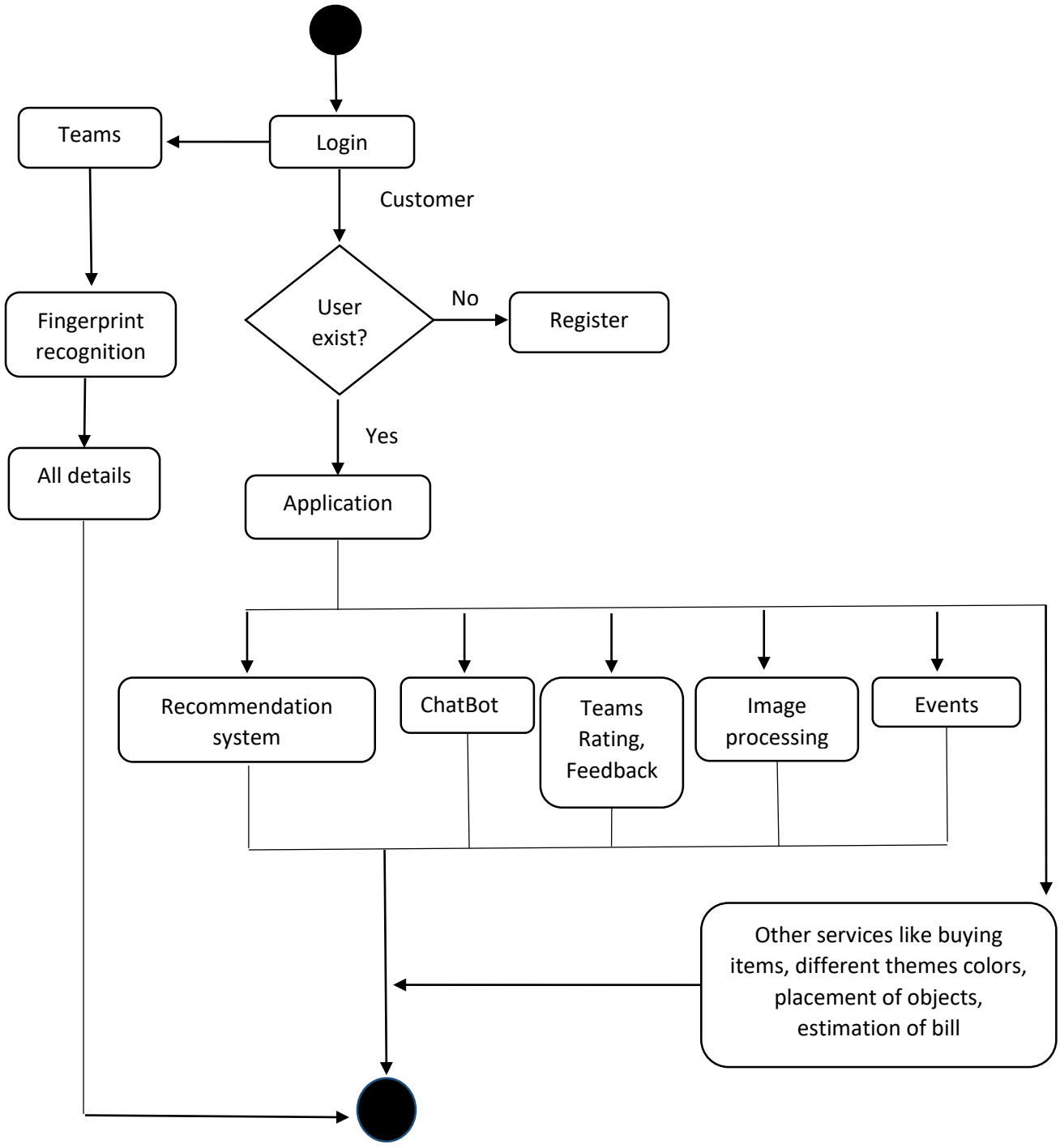

Figure 4.5 Activity Diagram

4.5 Entity Relationship Diagram

Figure 4.6 shows the ER diagram of our project, we have different entities like user, teams, order, items, feedback and events. User can buy zero or many products, one user can give zero or many orders, many users can choose many teams, one user can give one feedback, many teams have one rating, teams can see the details of the users, and many users can choose many events.

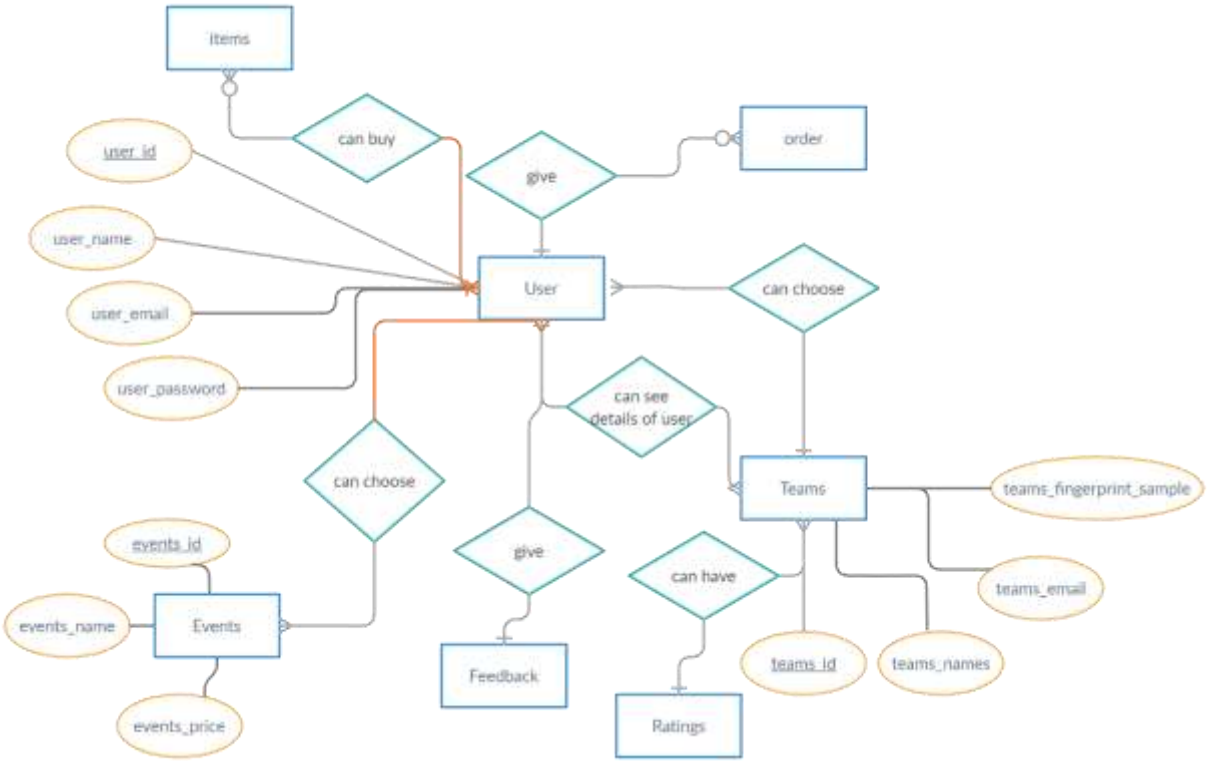

Figure 4.6 ER Diagram