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Nepal Fashion Gear (NFG)

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Declaration Sheet

(Presented in partial fulfillment of the assessment requirements for the above award.)

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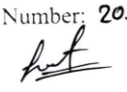
Signature: 

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Abstract

Nepal Fashion Gear is a wearable item online application with the goal of providing individualized clothing to everyone in Nepal. Its goal is to provide an online platform where customers may log in and search for products before adding them to a shopping basket. Users can rate things in Nepal Fashion Gear once they have purchased them. Similar products that have been highly rated by the respective users will be recommended by the AI model based on user ratings.

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1. Introduction

Nepal Fashion Gear (NFG) is a web-based e-commerce store where we can find the different categories of clothes from different brands. During the covid-19 pandemic, e-commerce is one of the highly growing businesses throughout the world. Due to lockdown, prohibitions to travel outside make many people move to purchase things online. Whereas in Nepal, some of the big e-commerce platforms like, Daraz and Sastodeal also perform quite good in those days. Now, if we look over Daraz and Sastodeal they focus on selling a wide range of products from electronics, mobile phones, clothing, toys, beauty products, and much more. As a result, users might be confused about what they are looking for and cannot find their desired products. Therefore, this project aims to build an e-commerce platform where we mainly deal with fashion-related items.

Nepal Fashion Gear is a web application for wearable products that aims to provide personalized clothes to everyone throughout the country. It intends to provide an online platform where login users can search the different products and can add them to the cart for the buying process. Where users can search the products and find their respective results without login. Similarly, we can filter the searched result based on price and brand of products. Once users have bought the products and rate the products in Nepal Fashion Gear. Based on user rating AI model will be recommended similar products which have been highly rated to the respective users.

Similarly, the admin can perform the CRUD operation on the products and user database through the system. It also allows sending the message to the user about the brand-new products and discounts prices. This project aims to promote the local fashion brands of Nepal and provide platforms to sell their products all over the Country. Likewise, in admin dashboards, we have different charts and graphs through which the admin can visualize the sales of products.

1.1. Academic Question

- How Artificial Intelligence can be implemented to recommend wearable products that are frequently purchased and highly rated by the users using the internet?

1.2. Aims of Project

- To create the AI engine that recommends products based on item similarity.

- Develop a user-friendly and accessible web application for clothing stores.
- To notify the user when they buy the products.

1.3. Objectives

- Research on different similar projects and recommendation systems.
- Select the best AI algorithms for our projects.
- Products data will be collected to train the AI engine.
- A fully functional web application will be developed to buy wearable products.

1.4. Artefact to be developed

As Nepal Fashion Gear will be developed in web base application, it going to have the three main artefacts which are given below.

1.4.1. User Management System

In this system, we are going to have the two types of user admin and customer who will visit and buy the products. First, users must register their account using their email address and name to add products to the cart and to buy. During registration, they will get a one-time password to verify their accounts. Register users are also allowed to change their personal information like username, email, address, etcetera. Similarly, as the admin of the site, they can perform the Create, Read, Update and Delete operation over the user data using the systems.

1.4.2. Product Management system

Likewise, in the user management system only the admin or staff that are created by admin can perform the products management operations like add, read, update, delete the details of the product in the database of the system. Whereas the customers can only view the added products by admin.

1.4.3. Recommendation Model

The recommendation model is one of the important parts of this system. It going to use item base collaborative filtering to recommend similar kinds of products that are bought and highly rated by the users. Item based collaborative filtering is a kind of recommendation system that look over the similar kinds of product based on the whether user had positively interacted with product.

1.5. Scope and limitations of System

This project main idea is to build the ecommerce system for the wearable products which aim to recommend the product based on the item-based similarities. There are some limitations of using the item based collaborative filtering which include the cold start problem. As the similarity of product is based on rating from the user. Due to limited number user rating, it is difficult to provide the recommendation for the new product having the zero rating. Similarly, due to the use of pickle file we have to rerun the recommendation model to recommend the product for new added rating. Similarly, the project only supports the PayPal as payment method which limit the user who do not use the PayPal.

2. Literature Review

2.1. Introduction of eCommerce with a brief History

(Bhat, Kansana, & Majid, 2016) The term E-commerce refers to Electronic Commerce where anyone can buy and sell their products and services through the internet. The internet revolution has accelerated the growth of online business all over the world. Ecommerce enables people to purchase any kind of product conveniently, at any time with a reliable payment method. (Tian & Stewart, 2007) Even though people have only just been aware of e-commerce, it has been in existence for over forty years (during the ’60s). The history of e-commerce is entwined with the development of the internet.

2.1.1. The Infancy of Ecommerce: Before 1995

The invention of Electronic Data Interchange (EDI), which sends business files from one computer to another, enabled the rise of e-commerce. EDI, which was first developed in the mid-1960s, enabled businesses to communicate information and make orders using computers. In 1979, Michel Aldrich invented electronic shopping through the modified TV and the telephone line. By the late 1990s, EDI had been deployed by less than one percent of European and American businesses (Tian & Stewart, 2007).

Products and services are transferred via the Internet in the second generation of e-commerce, which began as a research tool but has mostly evolved into a commercial tool. To research high-tech sectors, the ARPANET computer network was built in the 1960s. When the Internet Protocol (IP) was adopted in 1983, all computers were able to communicate with each other over the Net using the same method of data transmission. Most Internet users were still

government or university researchers and engineers towards the end of the 1980s. The ability to explore the World Wide Web, as well as a graphical user interface (GUI), transformed how people utilized the Internet. Later, the internet became more user-friendly for folks who did not have a strong computer science background.

In 1991, the National Science Foundation Network (NSFNET) opted to abolish commercial network usage restrictions. In 1993, Mosaic, one of the first Internet browsers, was released. Then came Netscape's revolutionary Navigator browser, which ushered in the era of online shopping for most of the world. The graphical user interface of Mosaic, as well as its rapid adoption, made the Internet more user-friendly (Tian & Stewart, 2007).

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2.1.2. The Golden Age of Ecommerce: From 1995 To 1999

Most internet users were involved in some form of commercial activity by the mid-1990s. Following America Online's 1995 acquisition of ANS as part of the "transition of backbone infrastructure from government support to fully privatized operation," In 1995, Amazon and eBay were established. In 1997, the commercial domain eclipsed the educational domain as the most often used due to the emergence of online stores such as Amazon.com, eBay, and Dell. In 1998, PayPal makes its debut as an online payment solution for e-commerce.

Several firms created an online presence and began doing business via the internet between 1995 and 1999. In the United States, e-commerce transactions generated $707 million in 1996, rising to $2.6 billion the following year and $5.8 billion in 1998. Also, from $267 million in 1996 to $907 million in 1997 and $3 billion in 1999, internet advertising surged from $267 million in 1996 to $907 million in 1997 and $3 billion in 1999. More than 300 internet firms went public through initial public offerings between 1998 and 2000. (IPOs). This system was managed by Network Solutions, which was terminated by the National Science Foundation (NSF) in 1996. (DNS)The United States of America (US) declared war on Iraq in 1997. The Department of Commerce released a White Paper suggesting the establishment of a new private, non-profit organization to operate the DNS. ICANN (Internet Corporation for Assigned Names and Numbers) was founded in 1998. ICANN's first two years were distinguished by decisions such as allowing more competition among registrars and requiring mandatory arbitration for trademark disputes (Tian & Stewart, 2007).

2.1.3. The Brust of the Dot Com bubble: 2000 and 2001

The dot-com bubble burst with the dot-com boom in 2000. Between March 10 and April 14, 2000, the National Association of Securities Dealers Automated Quotations (NASDAQ) and the Dow Jones Internet Index, which track high-tech stocks, both fell by 34.2 percent. Companies like Boo.com and Value America were forced to declare bankruptcy due to a lack of investors. Online sales rose by 19.3% in 2001 and 19.5% in 2000 despite the failure of numerous internet enterprises (Tian & Stewart, 2007).

2.1.4. The Resurgence of E-Commerce: 2002 to the Present

E-commerce has continued to grow even after the dot-com bubble broke. Total e-commerce sales were predicted to be $45.6 million in 2002 and $54.9 billion in 2003. E-commerce still does not make up a major portion of the economy. Universal access, privacy and security concerns, as well as Internet fraud, must all be taken into account and dealt with. Specifically, the issues that e-commerce offers to establish legal jurisdictions, personal privacy, transaction security, tariffs, and taxes will be discussed in detail (Tian & Stewart, 2007).

During the different periods, different types of e-commerce were lunches with a different purpose. In 2004, Shopify was launched which provide the platform for online stores and point-of-sale features. Likewise, Amazon introduce the Amazon Prime membership in 2005, which provide different features like free shipping and heavy discounts on products. In 2011, Google Wallet was introduced for digital payment and Stripe launches online payment processing for internet business. And in 2014, Apple Pay introduce the mobile payment method. Similarly, in different social media like Facebook, and Instagram we found different pages which contain the details of products with the price, which eventually promotes e-commerce (BigCommerce, 2021).

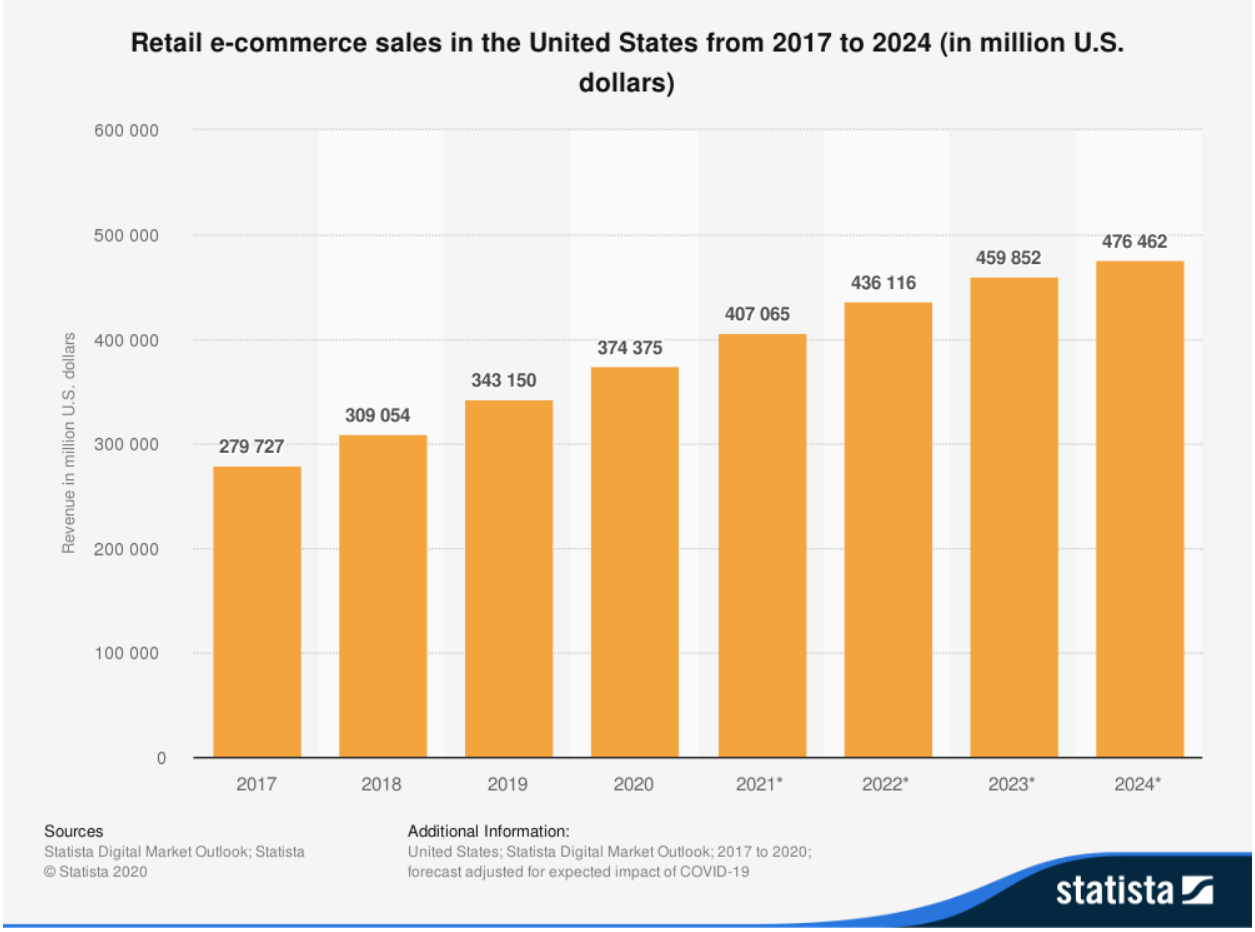


Figure 1: Retail e-commerce sales in the United States from 2017 to 2024 (BigCommerce, 2021)

2.2. Similar System

Daraz and Hamrobazar: Daraz is one of the top market-leading e-commerce of Nepal which provides the ultimate solution for the customer. They offer a huge range of products and update daily by adding different new products by sellers. It also uses some of the market-leading strategies like “Daraz 11.11” where we can find the different mega deals, discounts, and other different bank discounts and digital wallet discounts. Whereas Hamrobazar is especially popular for buying and selling used products. It provides the platform where users can be able to post their used products advertisements with their information and buyer will directly with them.

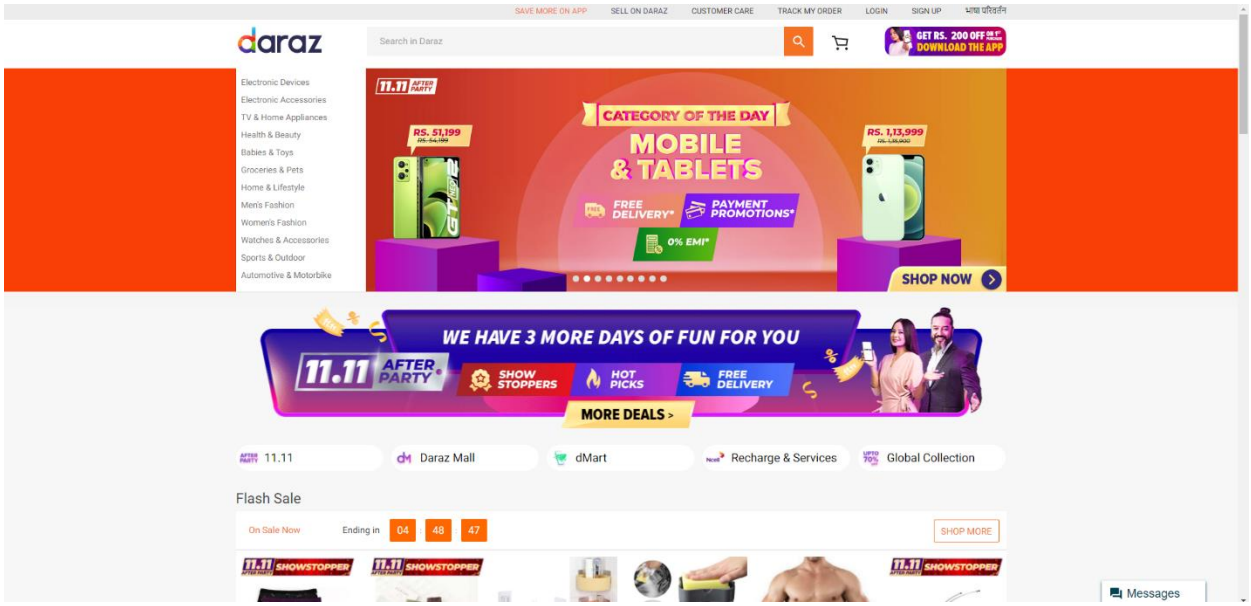


Figure 2: Website of Daraz Nepal

Sastodeal and Foodmandu: Sastodeal is also one of the popular e-commerce of Nepal, Like Daraz it also provides provide the platform to sell their products for those vendors without additional costs. It also provides a wide range of goods with great discounts for millions of customers from those vendors. Whereas Foodmandu is the first company in Nepal to deliver foods from hundreds of famous restaurants. It provides different varieties of food dishes for their customer. They also have user-friendly and accessible web applications and mobile applications for the customers.

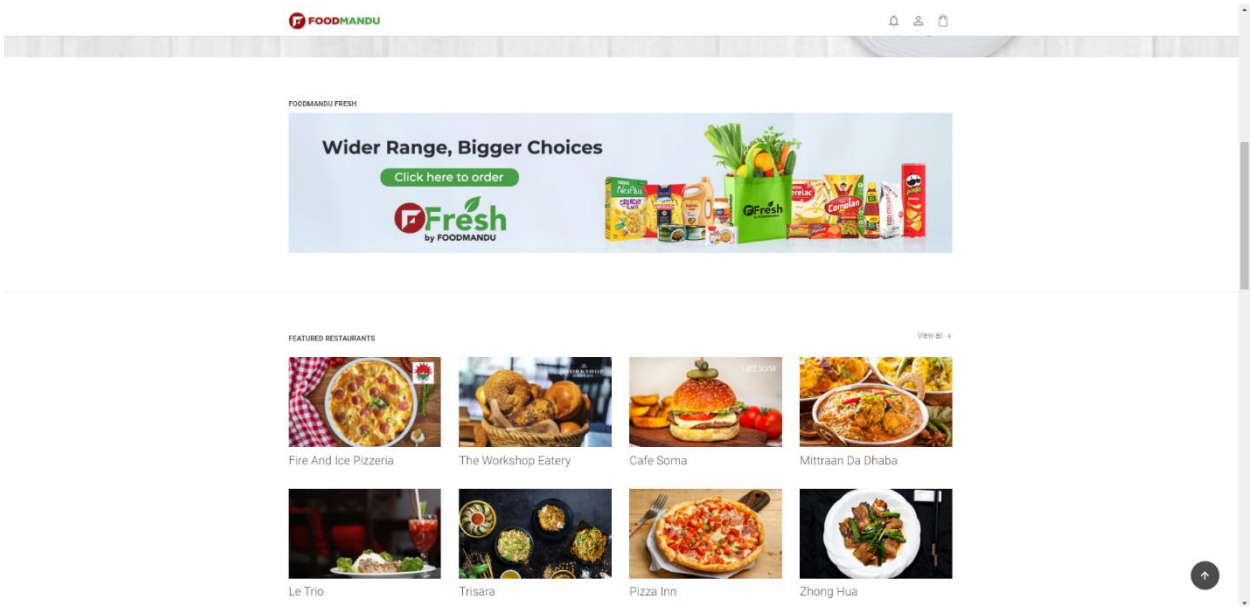


Figure 3: Website of Foodmandu

Now, if we look over the Daraz, Sastodeal, Hamrobazar, etcetera e-commerce platforms in Nepal, they usually follow the marketplace model. Where they provide the platform to communicate between the seller and buyer to sell their products. There are thousands plus sellers in those register their store and list the product in their platform. In this platform, we find the vast price difference of products from multiple sellers and some of the sellers are often selling duplicate products. Due to this customer may become confused and lose the trust from the products as well as from the platform. Whereas in Nepal Fashion Gear we apply the inventory model. It buys a massive quantity of products direct from the manufacture applying discounts through bargaining and storing in its inventory. Once the order is made it will sell the products avoiding duplicate products (Jose, 2016). It also reduces the time of delivery of products as it is already in inventory, we did not need to wait for the product delivery time from a seller to the warehouse.

2.3. Recent Trends in E-Commerce

(Keloth & Baskaran, 2018) Electronic commerce, or ecommerce, is a platform for selling products and services via the internet. Where internet-based payment transactions are possible. The numerous sorts of e-commerce models used by several big e-commerce firms are as follows. B2C (Business to Customer): This is one of the most frequent business models in which a company sells its products directly to customers. B2B (Business to Business): In this approach, one company sells its products to another company. C2C (Consumer to Consumer): This business operates by selling their outdated product to other consumers. Consumer to Business (C2B): This concept involves consumers selling their goods to businesses. Take a peek at the many e-commerce trends that are currently being followed.

Connecting through social media: On social media sites such as Facebook, Instagram, and others, users publish various items on their accounts. Which alternatively provide products details to the customer which may increase the sales of the e-commerce company.

Quick Services: If we must do shopping physically, we must plan the whole day. Where online shopping reduces this burden and buying products easily using the internet and product will be delivered within the day.

Website and Apps: Most of the people have their mobiles phones and pc with them. Using this we have easy access to websites and applications through the internet. Amazon, eBay,

and other e-commerce platform have their user-friendly interface to access the products to buy.

2.4. Different Types of Ecommerce and How does it work?

In e-commerce, we often purchase and sell goods and services to end-users or businesses through the internet. Business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer (C2C), and consumer-to-business (C2B) are the four primary categories of e-commerce (C2B).

2.4.1. Business to Business (B2B)

B2B e-commerce is a sort of online shopping that caters to companies rather than people. To connect with suppliers, distributors, and agents, e-commerce enterprises use Electronic Data Interchange (EDI) (EDI). For example, manufacturers and distributors expect a high level of protection. Using e-commerce technology, the order-ship-bill cycle of inventory management may be shortened by connecting business partners with the organization and providing faster data access. The figure below depicts the B2B business model (Shaker, Alsaqour, Alsaqour, & Shafiyah, 2013).

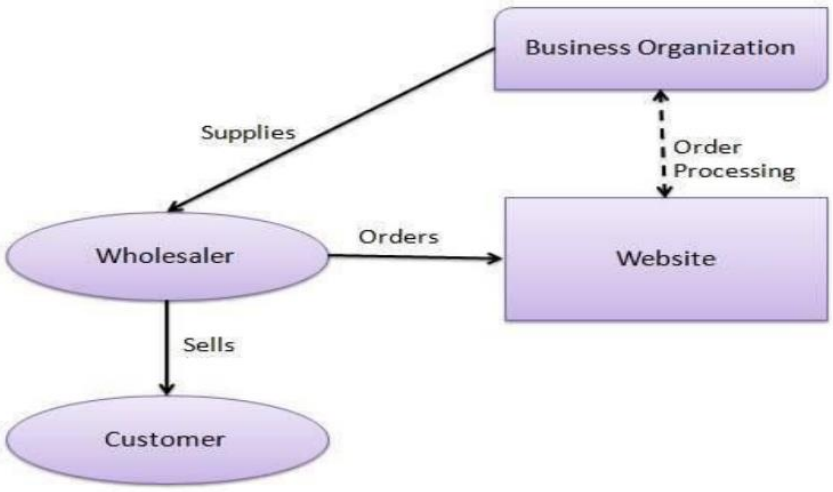


Figure 4: Business-to-Business (B2B) model (Taher, 2021)

2.4.2. Business to Consumer (B2C)

Business to consumer e-commerce is the practice of a company selling its products and services to any individual online. In these types of models, business organization create their websites.

Every individual will order their products their website and organization will deliver their services and goods to their customer (Shaker, Alsaqour, Alsaqour, & Shafiyah, 2013).

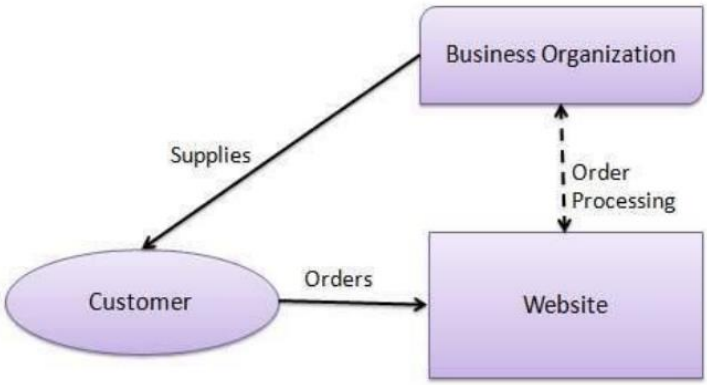


Figure 5: Business-to-Consumer (B2C) model (Taher, 2021)

2.4.3. Consumer to Consumer (C2C)

Customers sell their items to another consumer through the internet in a Consumer - to - consumer. Here, a website acts as the place for the advertisement of consumer products. Where the user posts their products details and the contact details on the website. And people who want to buy the products contact the selling customer. During the process, a website may or may not charge the seller some amount of money (Taher, 2021).

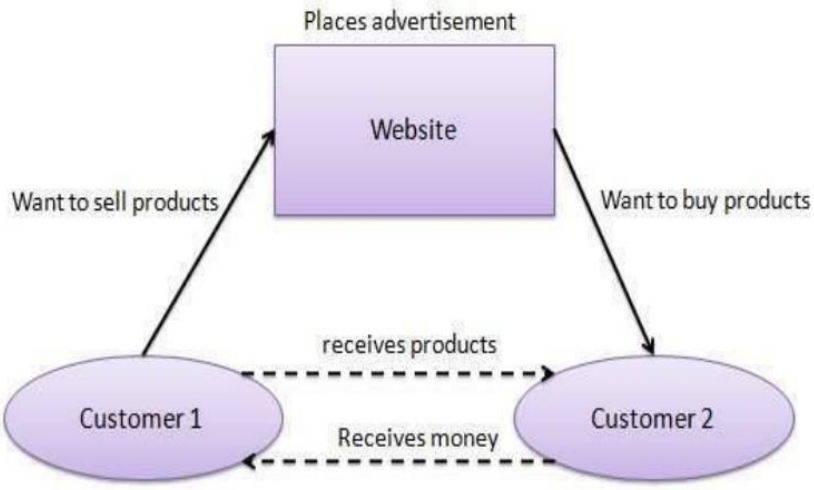


Figure 6: Consumer-to-Consumer (C2C) model (Tutorialpoint, 2021)

2.4.4. Consumer to Business (C2B)

Model individuals offer their goods and services to huge organizations in this type of e-commerce. For example, in Upwork many companies hire a different person for the different works and the companies will pay them for their services (Taher, 2021).

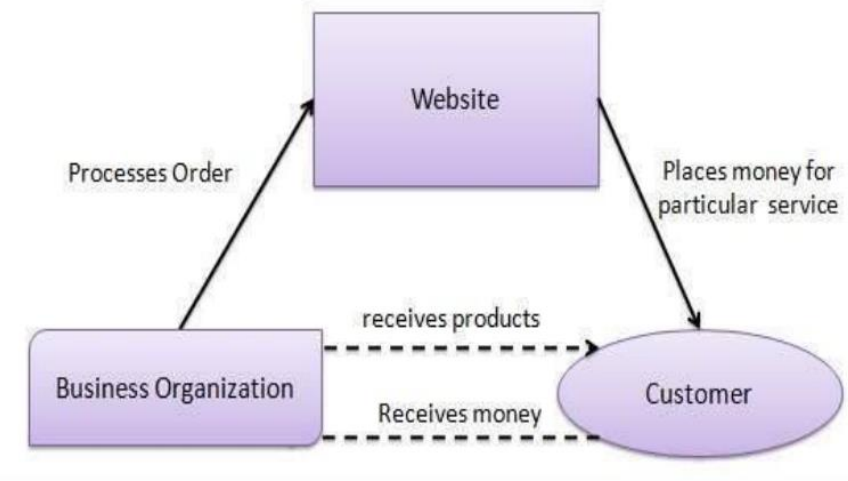


Figure 7: Consumer-to-Business (C2B) model (Tutorialpoint, 2021)

2.5. Different types of Recommendation System

Recommendation systems are information filtering systems that try to recommend items and services based on a variety of characteristics. It is an AI algorithm that tries to predict the relevant goods for consumers. For example, Netflix, Spotify use their recommendation system to recommend movies and songs respectively based on user likes and user preferences, Amazon uses them to suggest to the customer which products to buy. Likewise, it is used in different social media like Facebook, LinkedIn, Twitter, etcetera to some kind of recommendation to show the user liked the content. There are mainly three types of recommendations which are explained below.

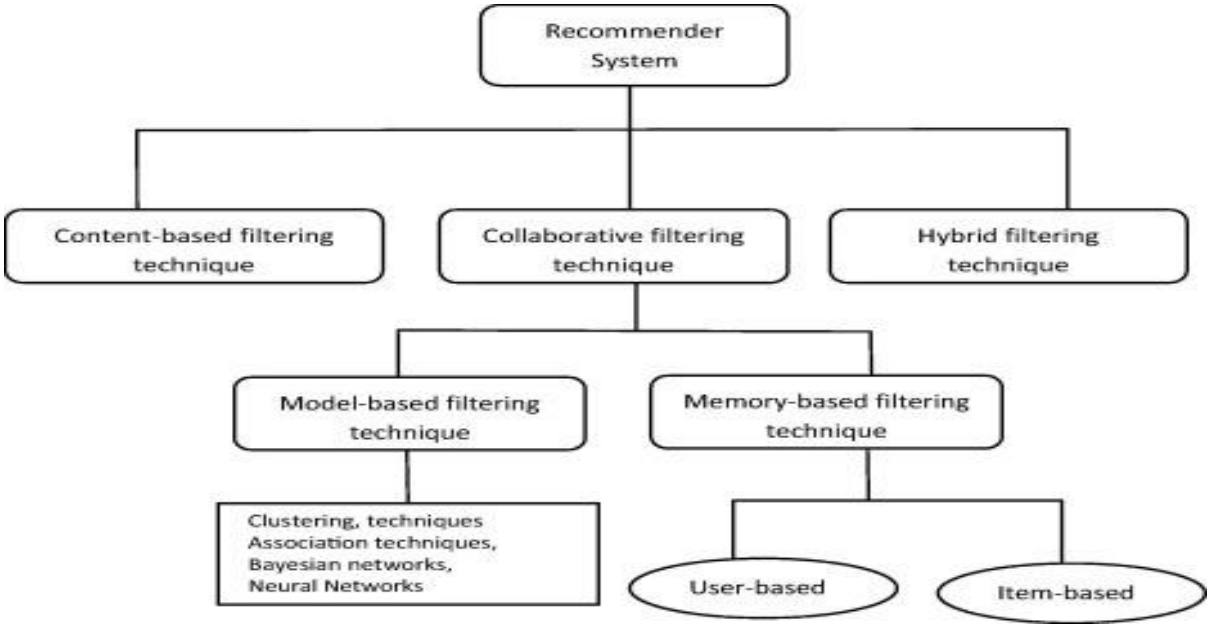


Figure 8: Different types of recommendation

2.5.1. Content Based Recommendation

Recommendation systems based on the content of a product utilize that information to propose other products. Item qualities are taken into account while making recommendations. It operates best when they have access to descriptive information about the content they are recommending. There are two approaches of recommending the products in content-based recommendation using user rated content and through the description of the content.

Movie\Attributes	Science	Adventure	Horror	Mystery
Interstellar	5	4	1	2
Inception	5	3	1	2
The Shining	1	2	5	4
Alien	2	3	5	3

Figure 9: Movie Attribute for user rated content to the recommendation

In user rated content approach ratings of a certain product are used to predict the rating of similar products. For example, if user A gives five rating to the movie Interstellar which fall on the movie attribute Science. Then the similar movies like Inception fall on the same attribute are recommended to user A. This type of approach works in even the product have the ratting and review. Similarly, in recommendation thorough description of the content, it uses the

descriptions of products for a recommendation. Term Frequency Inverse Document Frequency is used to extract the features of the items (TF-IDF). The Content-Based Recommendation System produces the item's profile using the Term Frequency Inverse Document Frequency (TF-IDF). Similarly, based on the previously liked, searched, rating and other user information a content-based user profile is developed. Now, it uses cosine similarity between user and item to recommend the products. Content-based recommendation system works totally with past like history of the user and does not need any other user's database which makes it user-independent (Bhat, Kansana, & Majid, 2016).

$$\mathrm{Tf}(t) = \frac{\text{Frequency occurence of term t in document}}{\text{Total number of terms in document}}$$

$$\mathrm{Idf}(t) = log_{10}\left(\frac{\text{Total Number of documents}}{\text{Number of documents containing term t}}\right)$$

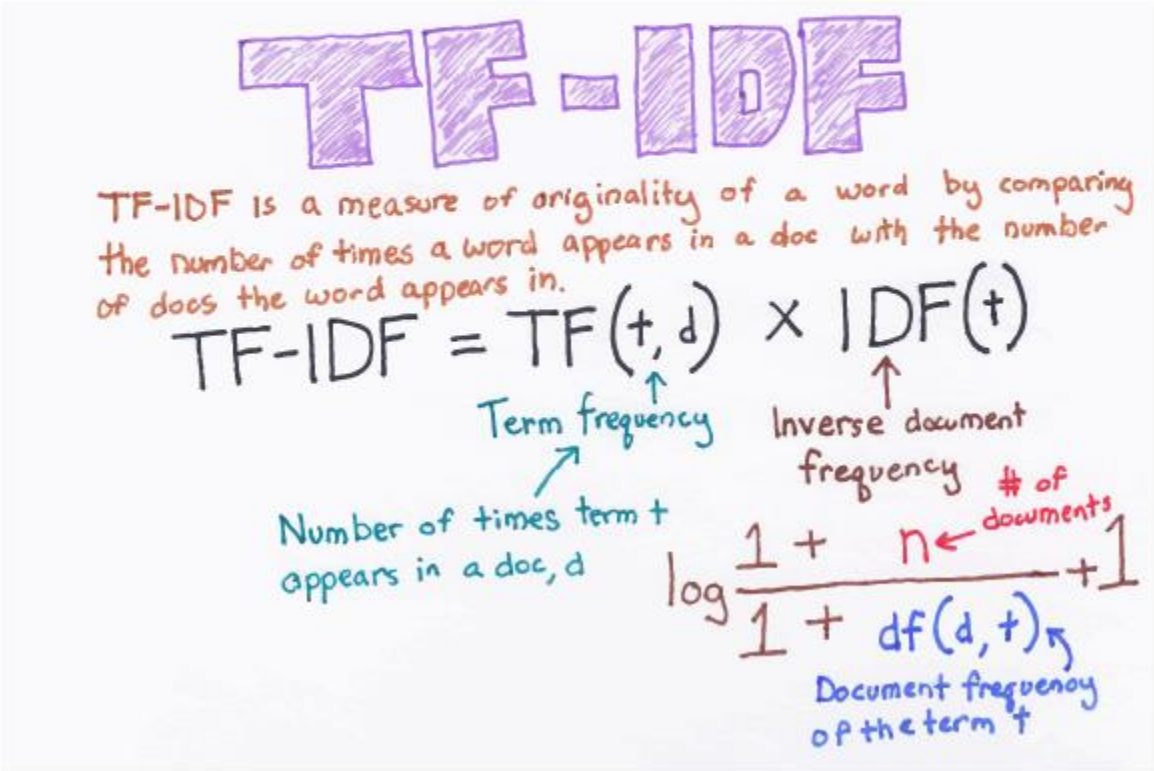


Figure 10: TF-IDF

2.5.2. Collaborative Recommendation System

(Gaudani, Patel, & Bhatt, 2014) To determine which products to suggest, systems that employ collaborative filtering gather user feedback in the form of ratings for items inside a certain category. Items are suggested to a user using collaborative filtering algorithms based on the opinions of other users. Let's example of a movie recommendation system, collaborative filtering check the similarity between the each and every user and predict best match results. Now, let us suppose user Alike the movie of XYZ and ABC then the other user B who like the XYZ, collaborative filter the recommend the ABC movies for the user B. The memory-based approach and the model-based approach are the two basic approaches used in the Collaborative Recommendation technique.

Model-based approach of collaborative recommendation system, it is possible to apply a variety of machine learning algorithms that relies on a pre-computed model of the material. This includes techniques such as, clustering, Bayesian networks, sparse factor analysis, Markov decision processes, and rule-based procedures. Memory-based approach of collaborative recommendation systems are more prevalent in literary works than model-based methods. Memory-based algorithms do not require pre-computation, and no offline design is built. To make a forecast or suggestion, all information is instantly accessible, including the most current transaction information, which is the primary advantage of the model-based method (Alizadeh, Nilashi, Bagherifard, & Ibrahim, 2013).

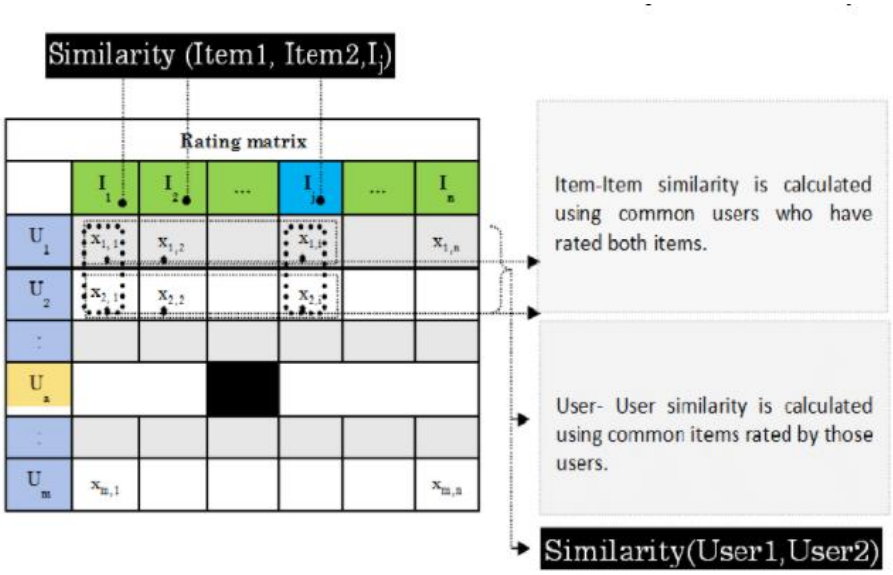


Figure 11: Item and user-based similarity memory-based CF

2.5.3. Hybrid Recommendation System

(Burke, 2002) Hybrid recommendation systems use the combination of two or more types of recommendation systems which eventually increases the accuracy of predictions. The mix of collaborative and content-based recommendation systems is the most common hybrid recommendation. Hybrid techniques are founded on the premise that a combination of algorithms will produce more accurate and effective suggestions than a single algorithm, because one algorithm's shortcomings may be remedied by another algorithm. The table below depicts the many forms of hybrid recommendation systems.

	Weighted	Mixed	Switching	Feature Combination	Cascade	Feature Aug.	Meta-level
CF/CN	P-Tango	PTV, ProfBuilder	DailyLearner	(Basu, Hirsh & Cohen 1998)	Fab	Libra	
CF/DM	(Pazzani 1999)						
CF/KB	(Towle & Quinn 2000)		(Tran & Cohen, 2000)				
CN/CF							Fab, (Condliff, et al. 1999), LaboUr
CN/DM	(Pazzani 1999)			(Condliff, et al. 1999)			
CN/KB							
DM/CF							
DM/CN							
DM/KB							
KB/CF					EntreeC	GroupLens (1999)	
KB/CN							
KB/DM							

(CF = collaborative, CN = content-based, DM = demographic, KB = knowledge-based / utility-based)

Redundant
Not possible

Figure 12: Table of Hybrid recommendation systems used in different system

Recommendation systems provide a better user experience by suggesting their preferred product and services. It increases sales and provides more customer engagement for any website. Now, if we look over the above recommendation system hybrid recommendation is the one the best recommendation system as it uses multiple other types of recommendation systems however using the multiple AI algorithm will be tedious for this project. And in collaborative filtering, we need a prediction of data based on multiple similar users which is not possible for this project. At last content-based recommendation will be perfect for this project as it does not need the data of multiple users as it is specific to a single user. In a content-

based recommendation system, we use TF-IDF is used to extract features from the products. Python is utilized extensively, including in the configuration files and the data models. It is also possible to have a Django administration interface that is built dynamically using introspection and set by admin models.

2.6. Comparing Backend Framework for system Development

Django: Django is a Python Web framework that encourages rapid development and a well-organized system design. Django is a free and open-source application development framework that avoids reinventing the wheel. Django makes it simple to construct sophisticated, database-driven websites, and it also supports component reusability and "plugging," fewer lines of code, lower coupling, quick development, and the don't repeat yourself principle. Python is commonly used, particularly in configuration files and data models. It is also feasible to have a Django administration interface that is dynamically constructed using introspection and is set by admin models. Udemy, Coursera, Pinterest, Instagram, and more popular online services built using Django (Shetty, Dash, Joish, & C, 2020).

Node.js: Node.js is a scalable network application platform based on an event-driven JavaScript foundation. Each connection results in a callback, regardless of how many are created. This one, like many other popular concurrency models based on operating system threads, behaves in a unique way. It uses Google Chrome's super-fast, highly optimized V8 execution engine for JIT (Just in Time) compilation (Shetty, Dash, Joish, & C, 2020).

Laravel: Laravel is a popular open-source popular general purpose (PHP) web framework that uses the Model View Controller (MVC) architecture to create Symfony-based online applications. It provides a modular packaging system with built-in dependency management. Laravel is widely regarded as one of the most powerful web frameworks on the market. Laravel also provides its users with a variety of techniques for accessing relational databases, as well as application management and deployment tools (David, n.d.).

Similarly, there are different other backend frameworks are available such as .Net Core, Express.js, Ruby, Spring.js, etcetera are available. If we compare all of them we are going to use Django as the backend framework because of its versatility, security, scalability, maintainability, and portability.

3. Project Methodology

Scrum is an agile software development methodology that follows the iterative and incremental development model. Scrum is usually used to develop complex changeable projects. In Scrum, one iteration of the month is also known as the Sprints. Scrum frameworks consist of different roles, artefacts, and ceremonies.

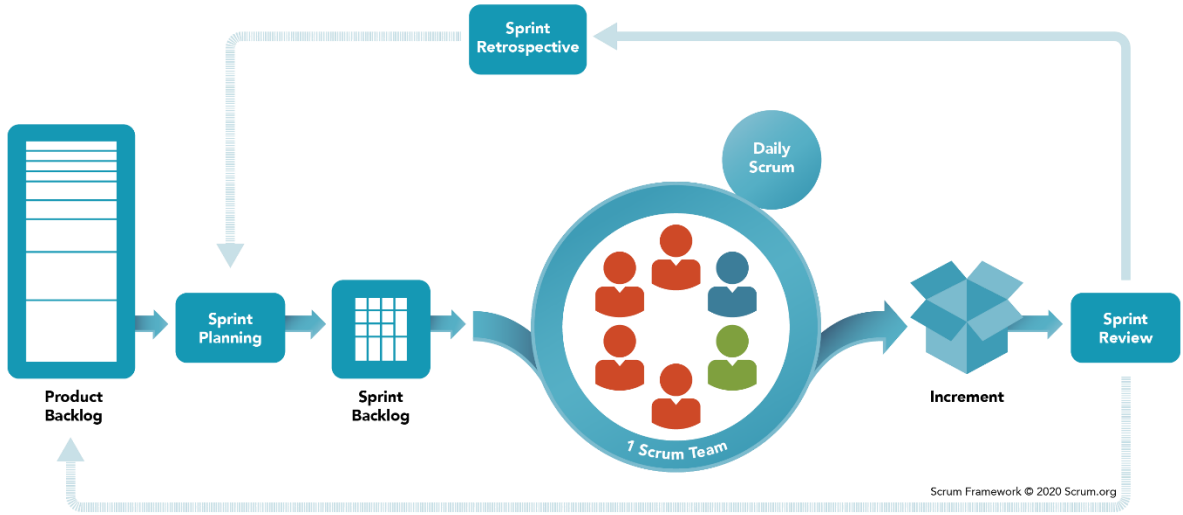


Figure 13: Sprint Framework (Scrum.org, 2020)

Scrum Roles: The Scrum team consist of three roles product owner, Scrum Master, and Development team. Here, the project owner is responsible for the requirement collecting from stakeholders and prioritizing requirements in products backlog and budget management of the project. Where the Scrum Master is responsible for promoting and supporting and guiding the scrum team. Whereas the development team are responsible for developing the quality of a product.

Scrum Artifacts: Scrum Artifacts consists of the product backlog, sprint backlog, Increment, and Sprint Burn-Down Chart. The product backlog is the list of features, function, and requirement that stakeholder wants in their product. Similarly, the sprint backlog is the list of requirements that are selected from the product backlog to complete the given sprint.

Scrum ceremonies (Event): In Scrum events are time-boxed events, which means that every event has a maximum time duration. The essential scrum events are the sprint, sprint

planning, sprint review, Sprint retrospective, daily scrum meeting. The Sprint is usually the one-month time frame when we develop the working product increment. In sprint planning, we usually discuss what will be done on the sprint and how the team is going to develop the product increment throughout the sprint. The daily scrum is a fifteen-minute event meeting conducted daily where the scrum team quickly discuss the last daily scrum and create the plans to work for the next 24 hours. Similarly, in Sprint retrospective comes at the end of the sprint where the scrum team evaluate themselves and make improvement plans for the next Sprint.

3.1. Gantt Chart

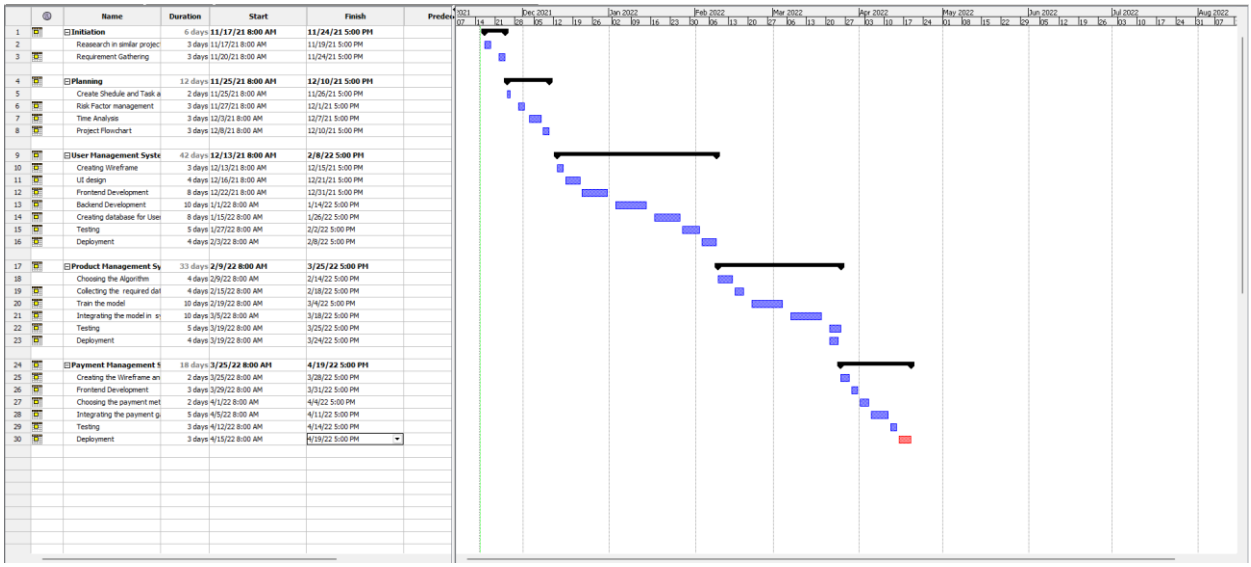


Figure 14: Nepal Fashion Gear Gantt Chart

4. Tools

The overall requirement and resources to develop the Nepal Fashion Gear are given below:

Hardware Requirements: i5 8th generation computer with stable internet.

Software Requirements:

1. Figma and Balsamiq for overall UI design and Wireframes of project
2. Bootstrap, JavaScript, and jQuery for frontend development.
3. Django for the Backend Development.
4. Integrated Development Environment: Visual Studio Code and Jupyter Notebook.

5. SQL Lite for a database.
6. Git Hub for Version Control.
7. Project Libre for Gantt charts.
8. Draw.io for making work breakdown structure, UML diagram, class diagram, etcetera.
9. Google Chrome, Microsoft Office, and others.
10. Libraries for AI: Pandas, Joblib, Sklearn. Numpy.

5. Artefacts

5.1. FDD of Nepal Fashion Gear

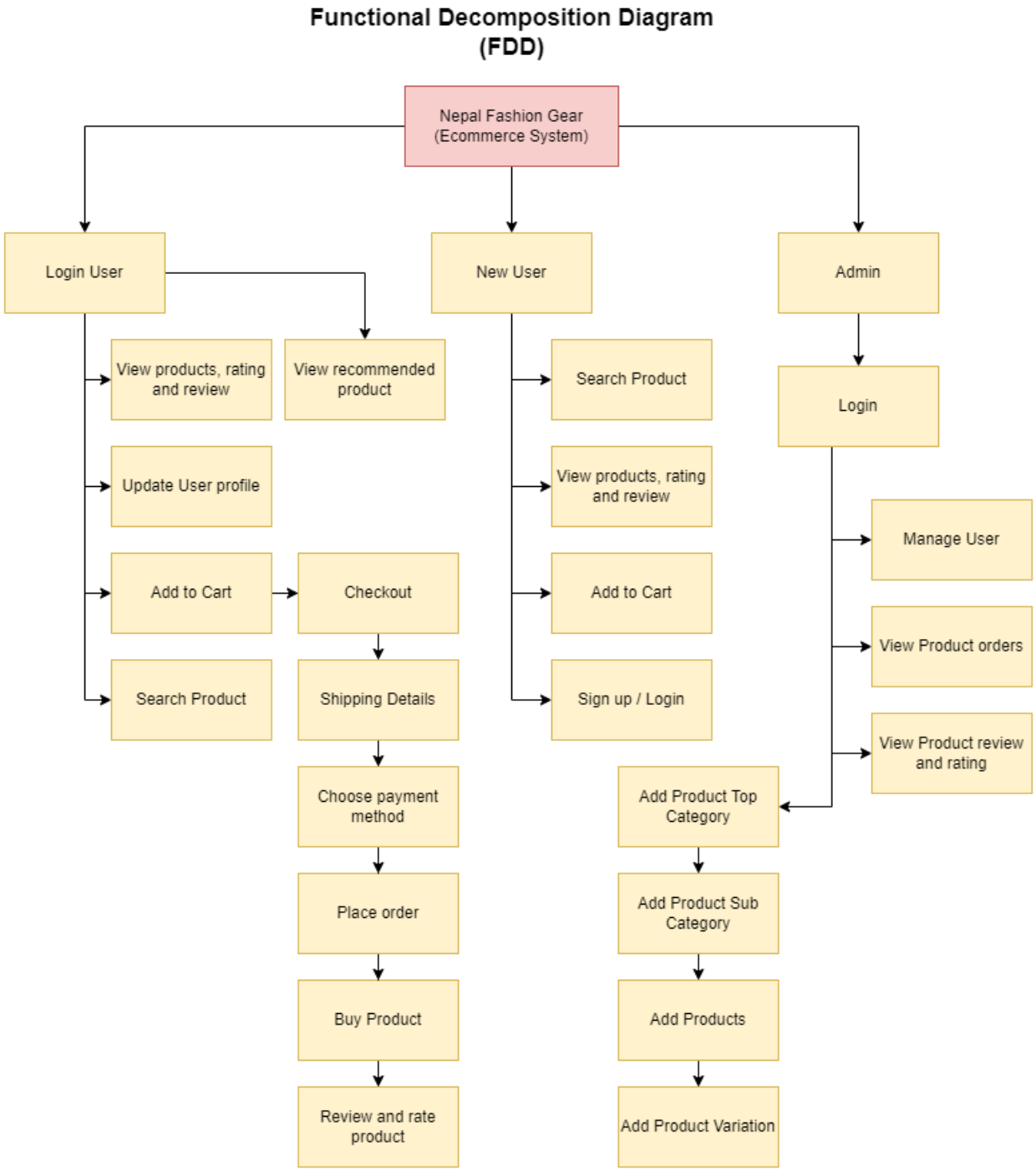


Figure 15: FDD of Nepal Fashion Gear

5.2. User management system

In this project, we are going to have the two types of user admin and customer who will visit and buy the products. First, users must register their account using their email address and name to add products to the cart and to buy. During registration, they will get a one-time password to verify their accounts. Register users are also allowed to change their personal information like username, email, address, etcetera. Similarly, as the admin of the site, they can perform the Create, Read, Update and Delete operation over the user data using the systems.

The following technologies that will be used to complete this system are:

Development Tools: Visual Studio Code

Programming language: Python, Django

Frontend: Bootstrap, JavaScript, and jQuery

Methodology: SCRUM

Other tools: Git hub

5.2.1. Software Requirements Specification (SRS)

Req. Code	**Req. Desc**	**Use Case**	**MoSCoW Prioritization**
UMS-F-1.0	System should facilitate the user to create the account using their unique email, name, address, and phone number, where a phone number is should not be unique.	Sign-Up	Must Have
UMS-F-1.1	The system must send the email verification link to the email address of the user whenever they sign up for the first time.	Email Verification	Must Have
UMS-NF-1.1	When creating the NFG account, user password must be encrypted before sending it to the system database.		Must Have

UMS-NF-1.2	Combination of passwords should be made from alphabets, numbers, and special characters.		Should Have
UMS-UR-1.1	In sign-up and login page system should have an option to hide and unhide the user password.		Should Have
UMS-F-2.0	System should facilitate every user to login into NFG account through the email address and password.	Login	Must Have
UMS-NF-2.1	System should encrypt the login user password before sending it system database.		Must Have
UMS-UR-2.1	System should display the error message to the user if they input the wrong information on the login or sign-up page.		Must Have
UMS-F-3.0	System should facilitate forget password option to recreate the user password.	Forget-password	Must Have
UMS-F-3.1	System must send the reset password link to the users when they enter their email address in forget password page.	Forget-password	Must Have
UMS-NF-3.1	Password reset link should have a limited time.		Should Have
UMS-F-4.0	System should facilitate admin to modify the NFG customer information and delete the user profile as per customer request.	Admin CRUD Operation	Must Have

UMS-F-5.0	The System should facilitate every users to modify their information through the user account.	Update User Information	Must Have

5.2.2. Activity Diagram

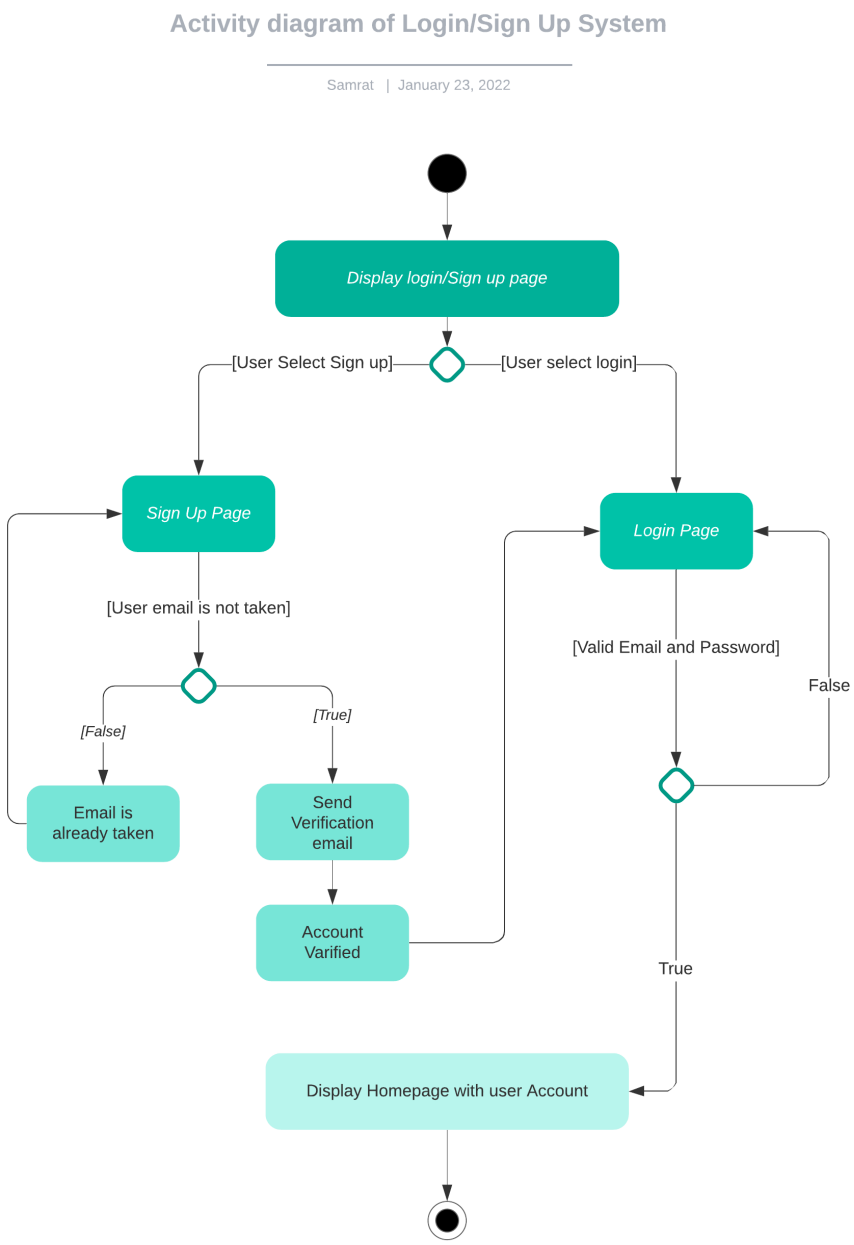


Figure 16: Login/sign-up activity diagram

5.2.3. Use Case Diagram

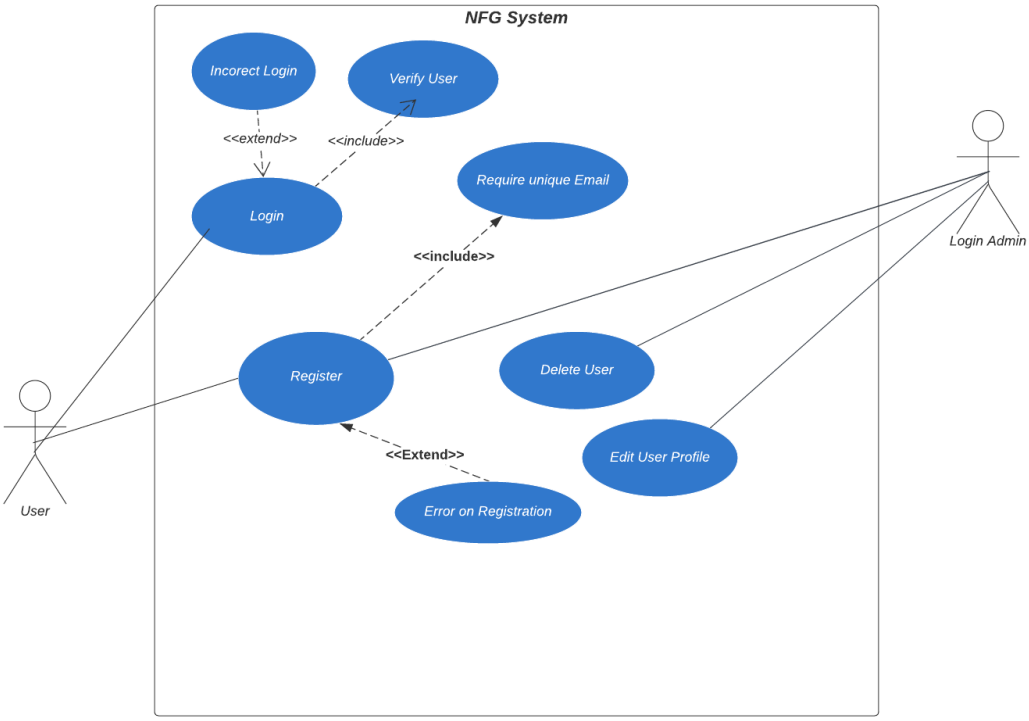


Figure 17: UMS Use case diagram

5.2.4. Wireframe

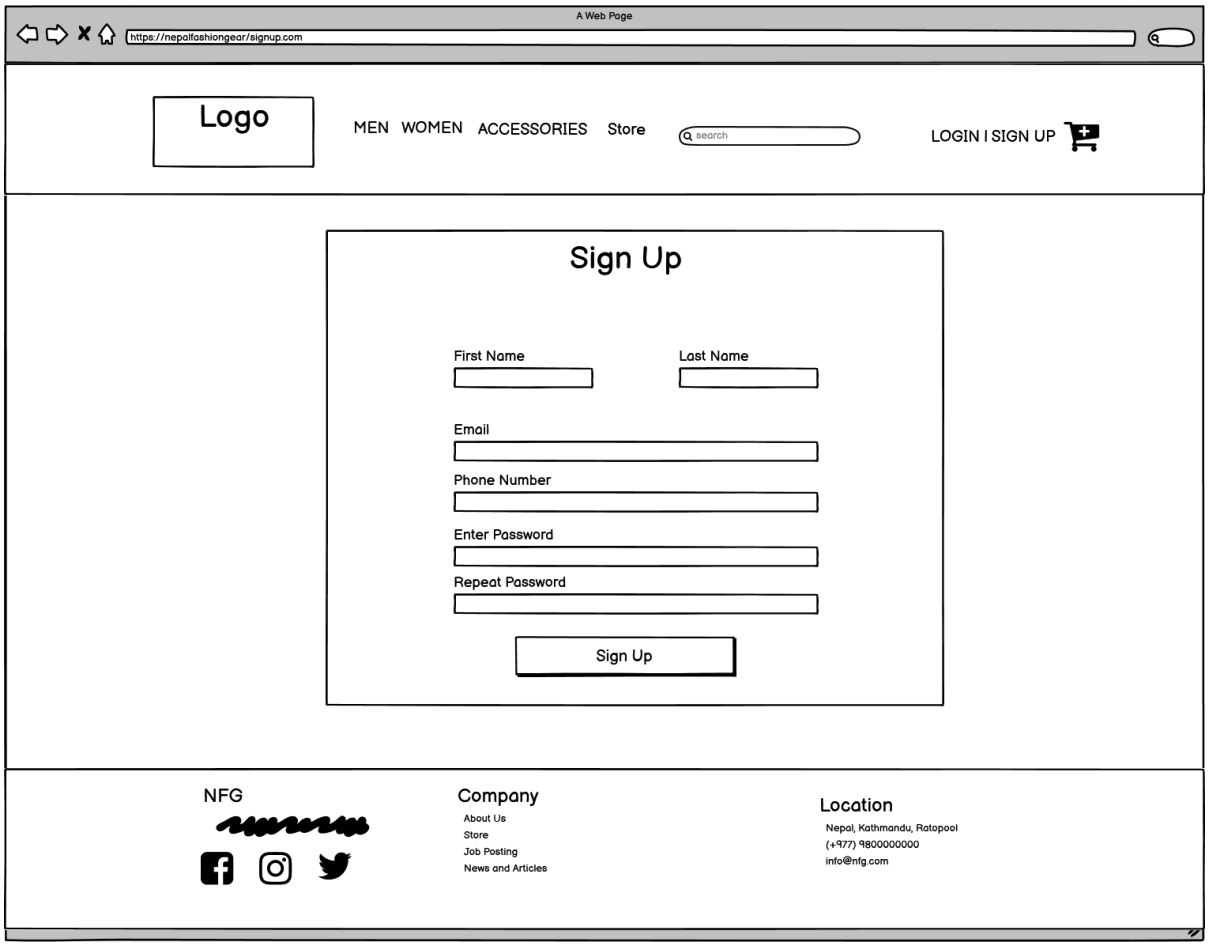


Figure 18: Sign-up page wireframe

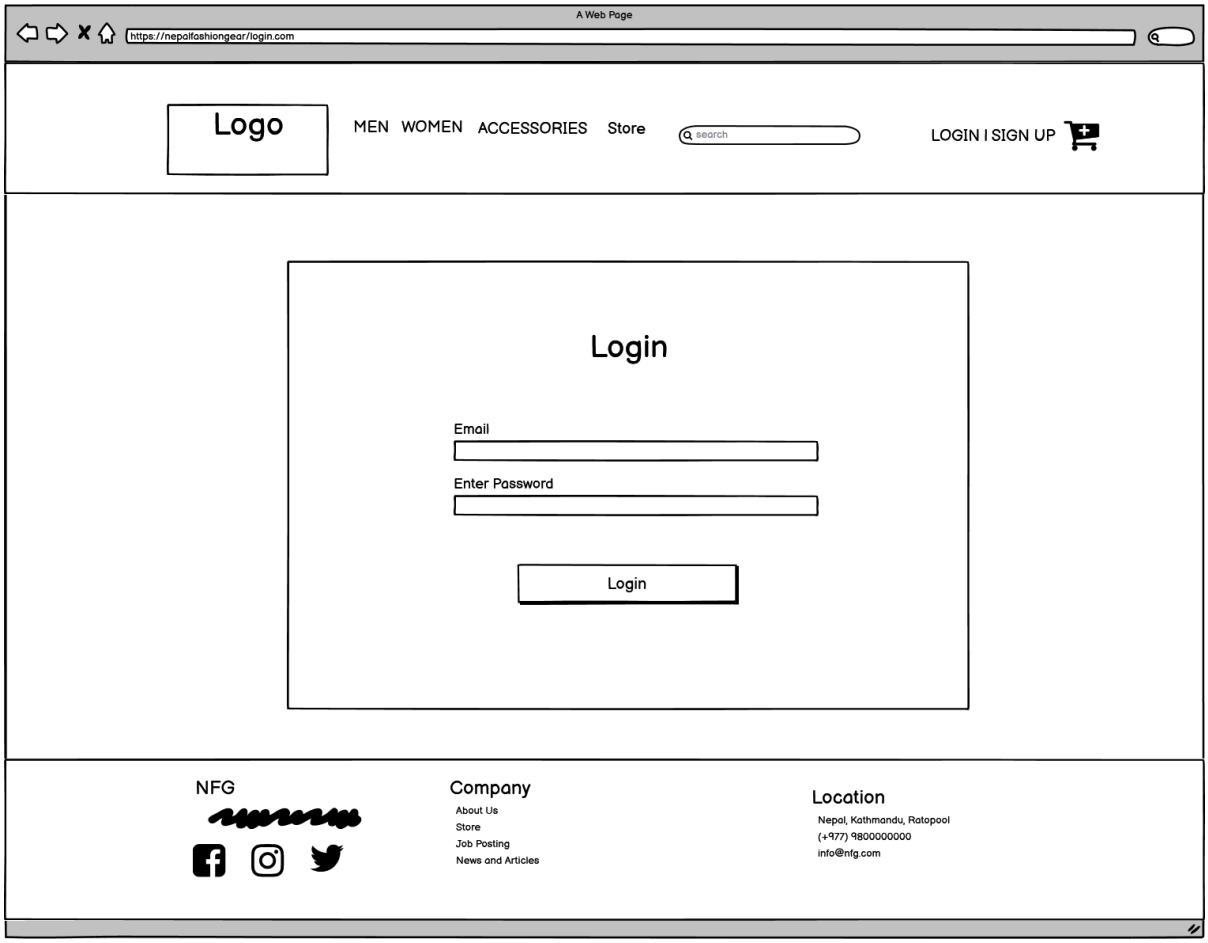


Figure 19: Login page wireframe

5.2.5. Entity Relationship Diagram (ERD)

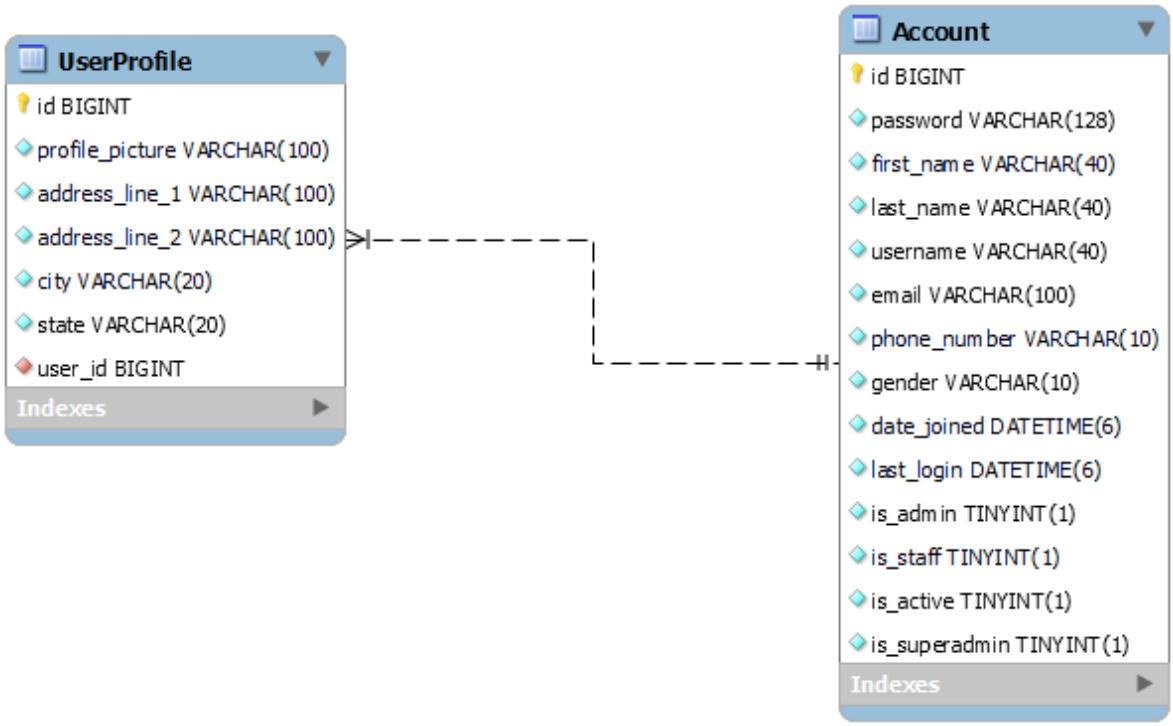


Figure 20: UMS ERD

5.2.6. Sequence Diagram

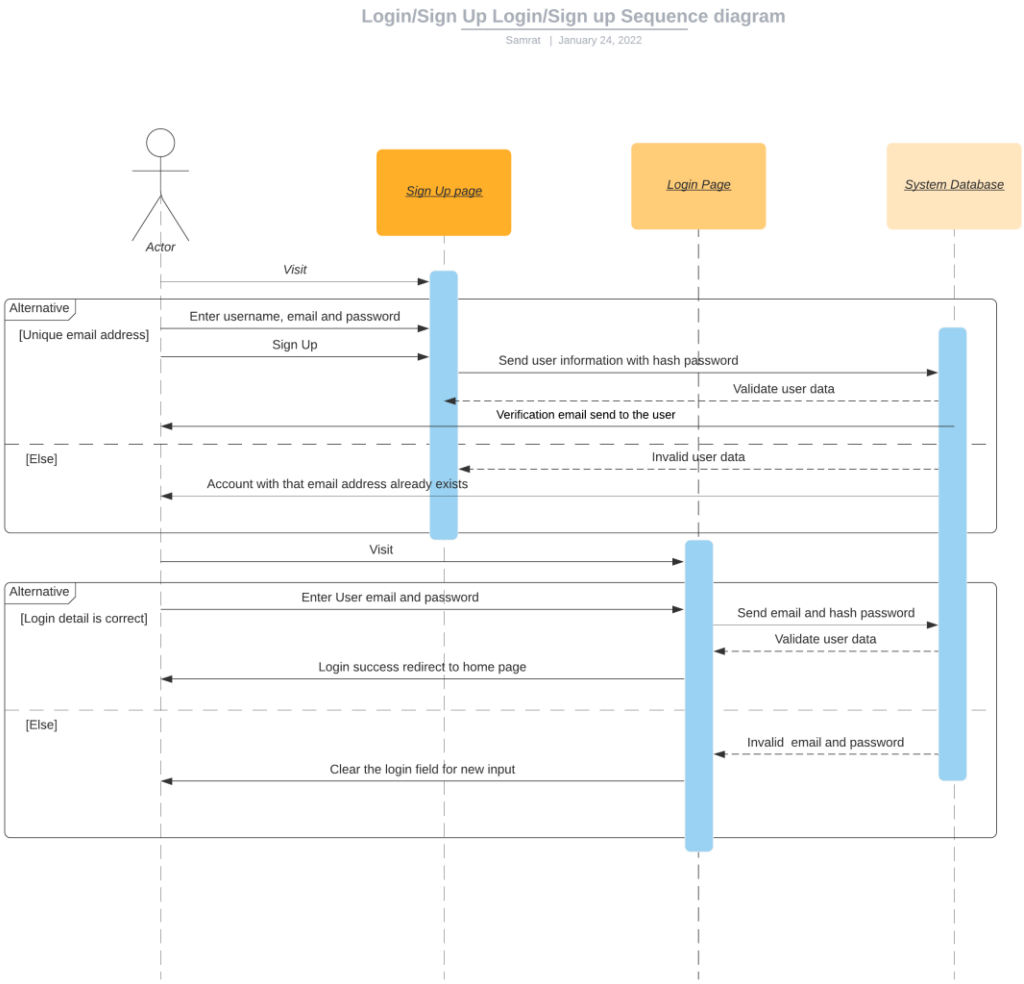


Figure 21: login/sign-up Sequence diagram

5.2.7. Class Diagram

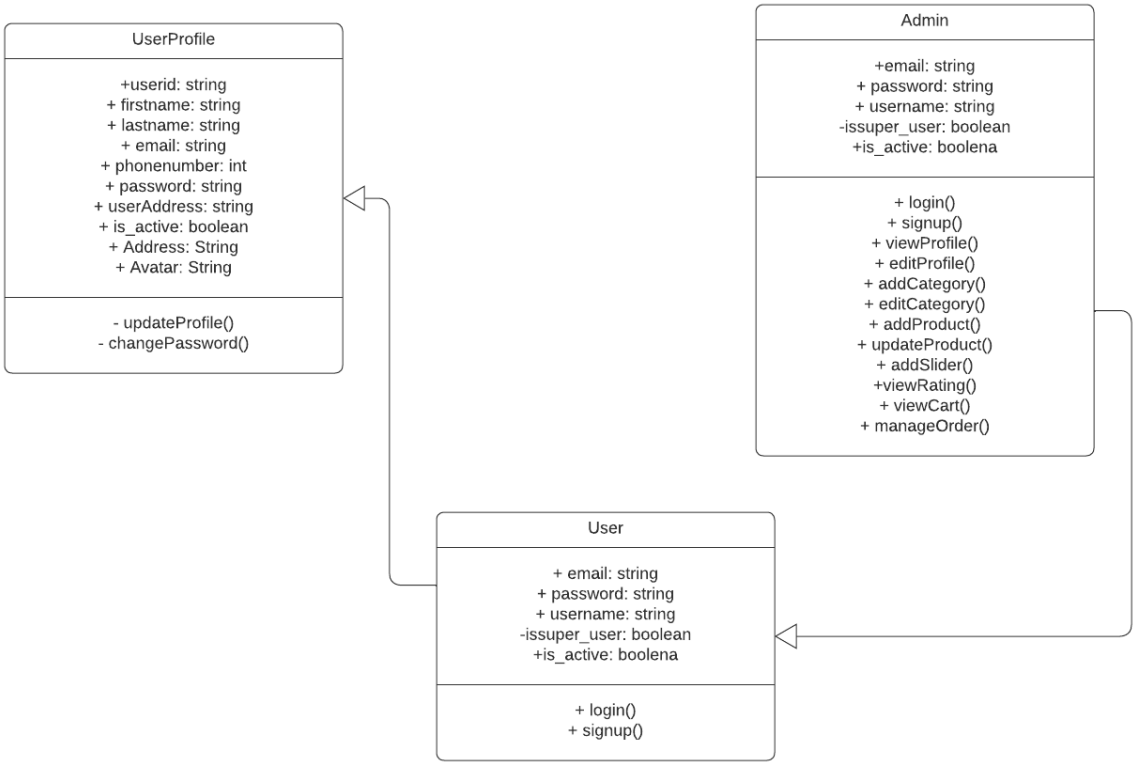


Figure 22: UMS class diagram

5.3. Product Management System (PRM)

In this system, only the admin has the access to perform the product management operation like adding the new product, updating the details of the product, viewing, and deleting the product details. As the details of different products vary, we need to create different forms for different products. Similarly, the registered user can view the products and add them to their cart and order if they like.

The following technologies that will be used to complete this system are:

Development Tools: Visual Studio Code

Programming language: Python, Django

Frontend: Bootstrap, JavaScript, and jQuery

Methodology: SCRUM

5.3.1. Software Requirements Specification

Req. Code	**Req. Desc**	**Use Case**	**MoSCoW Prioritization**
PRM-F-1.0	System should facilitate admin to create the product category like (Top product category, sub-category).	Create product category	Must Have
PRM-F-2.0	System should facilitate admin to add products based on category.	Add product	Must Have
PRM-NF-2.1	In admin site while adding a product, it should support adding multiple images of the product.		Should Have
PRM-UR-1.1	In admin site while uploading the image it should support a drag and drop image file.		Should Have
PRM-F-2.0	System should facilitate admin to add the product description, stock, brand, and price.	Add product description	Must Have
PRF-NF-2.1	Product description should be limited to 600 words.		Should Have
PRM-F-3.0	System should facilitate the login user to add product in cart page.	Add to cart	Must Have

5.3.2. Activity Diagram

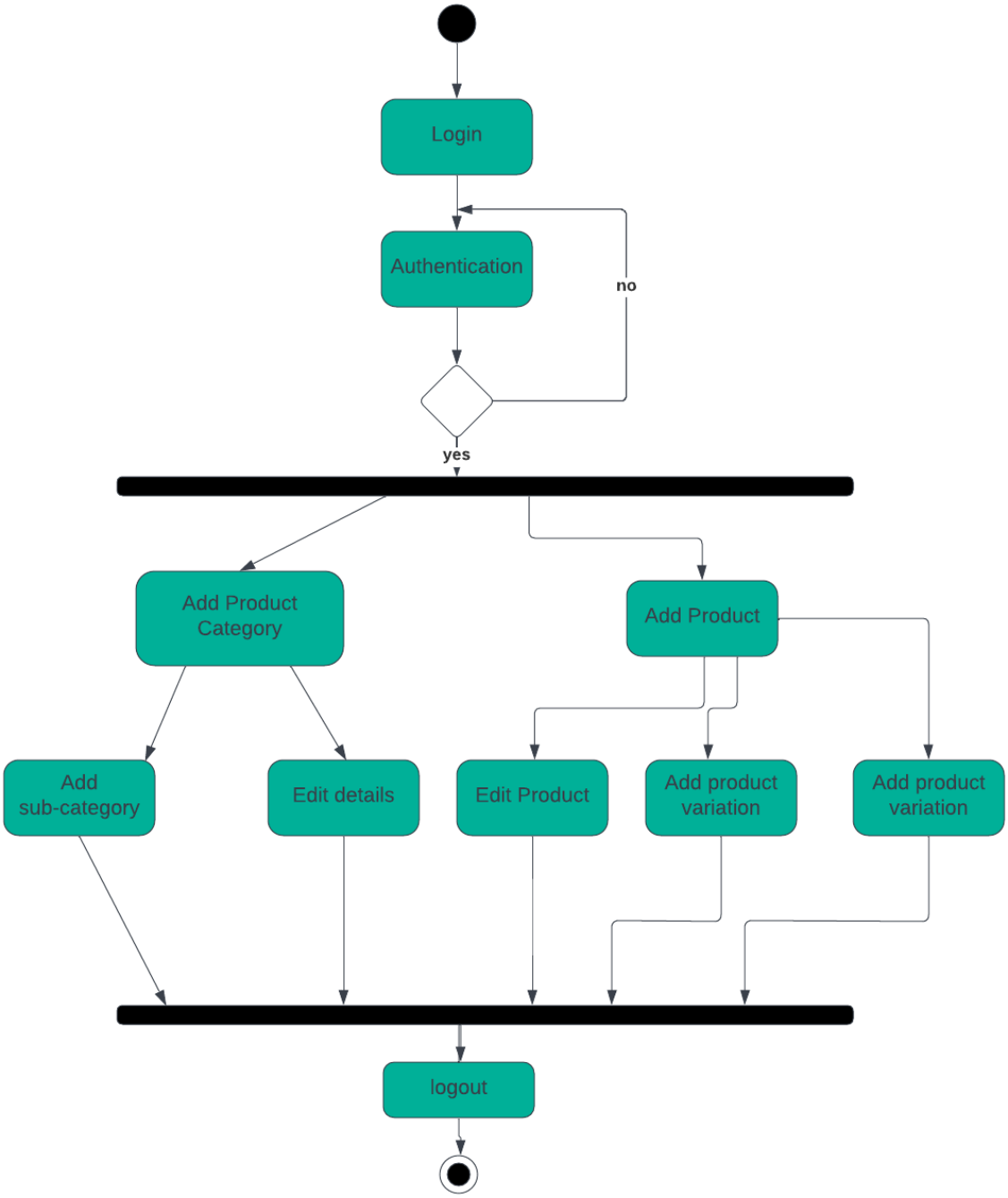


Figure 23: Admin activity diagram

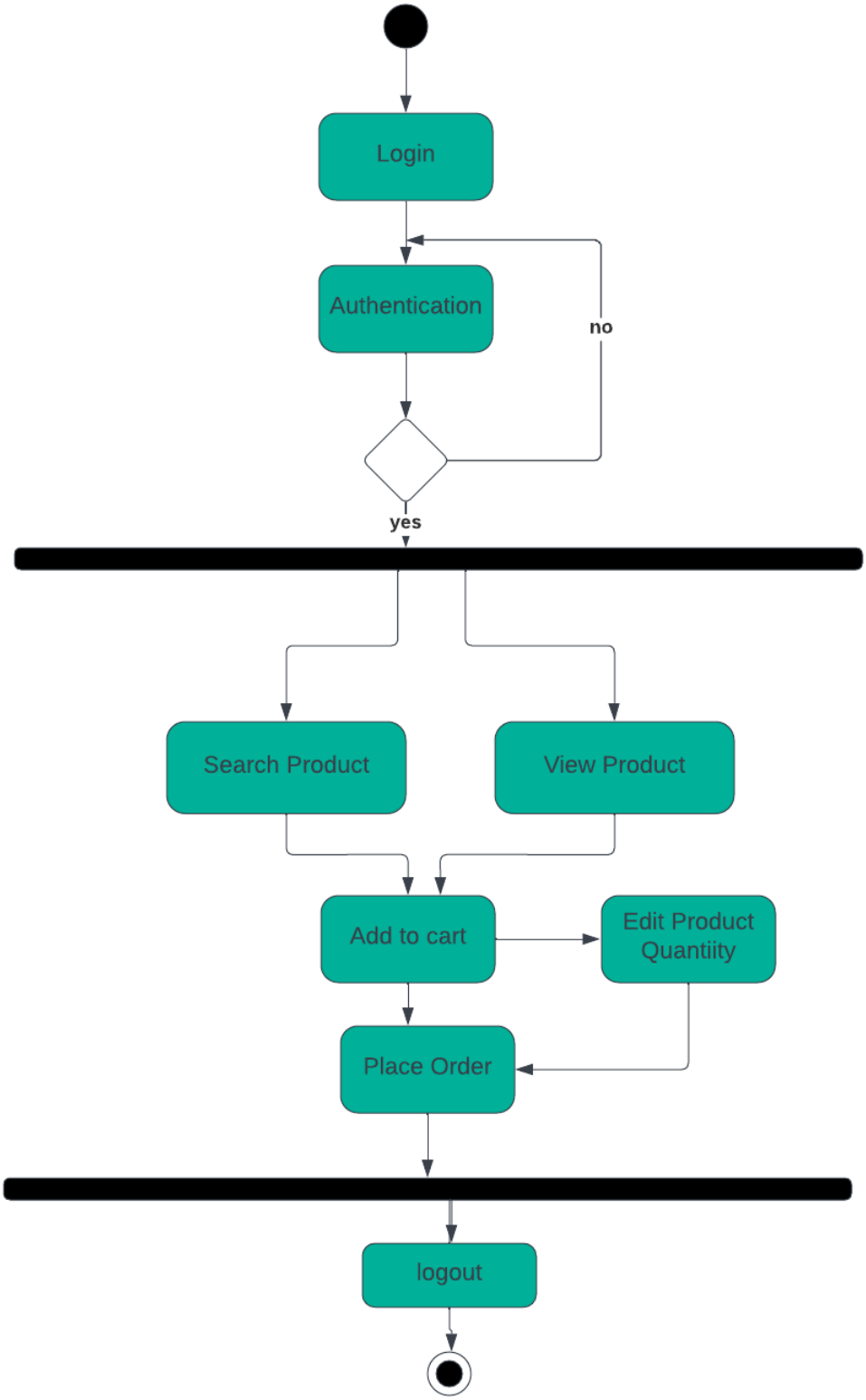


Figure 24 User activity diagram

5.3.3. Use Case Diagram of PRMS

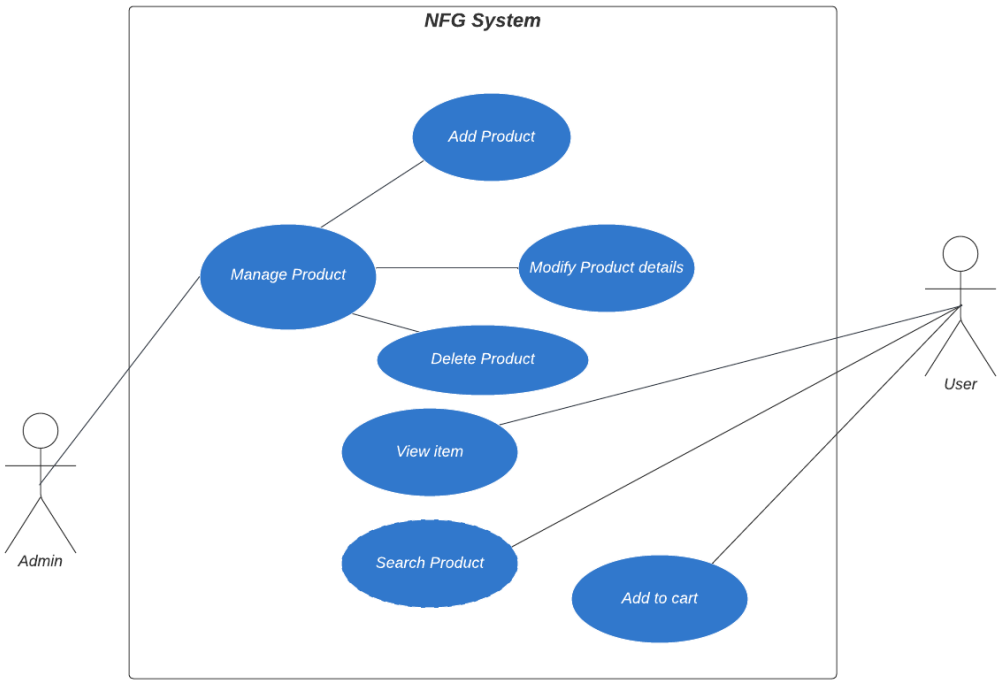


Figure 25: PRMS use case diagram

5.3.4. Wireframe

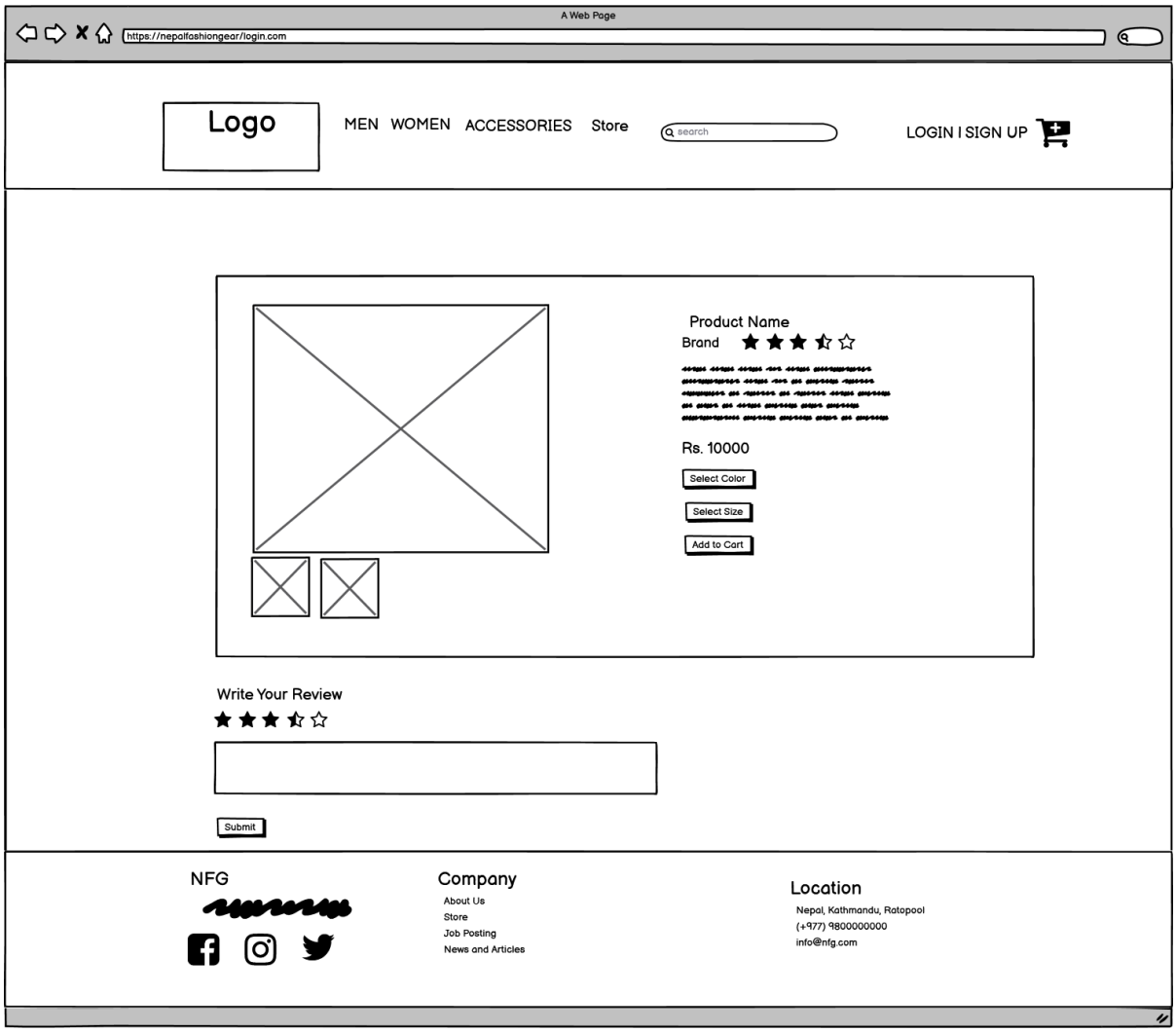


Figure 26: Wireframe of product details page

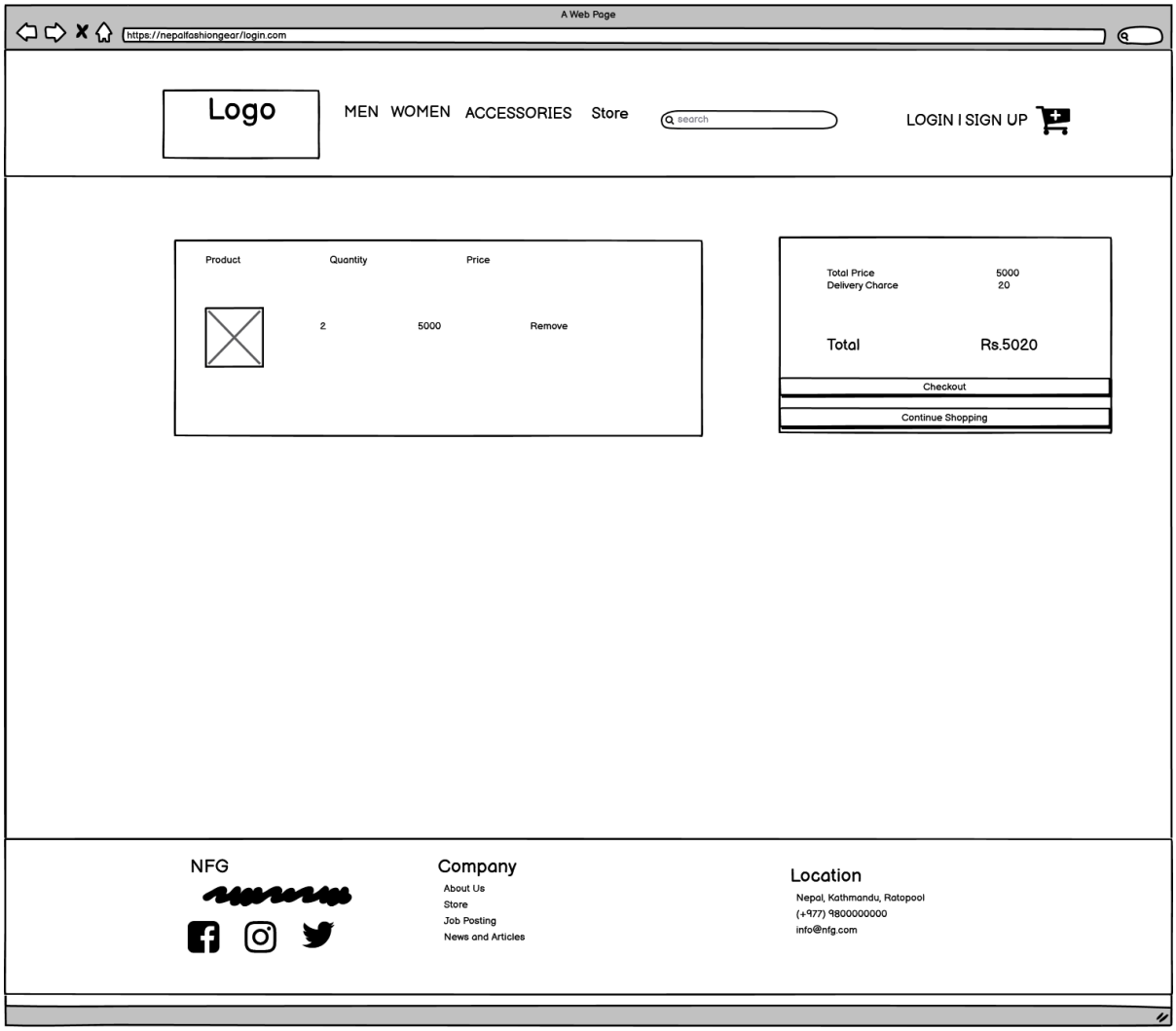


Figure 27: Wireframe of checkout page

5.3.5. Entity Relationship Diagram

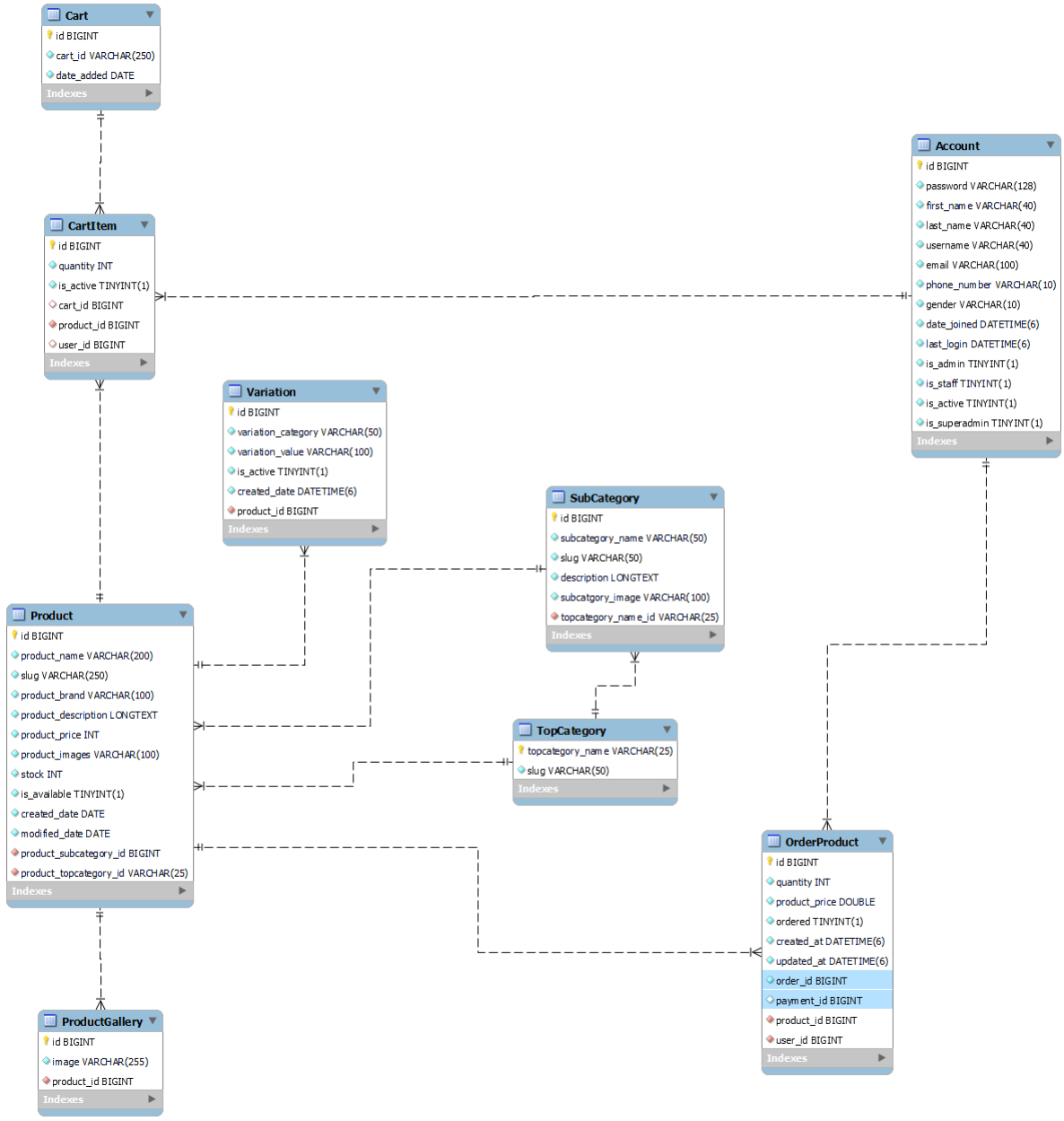


Figure 28: ERD of PRMS

5.3.6. Class Diagram

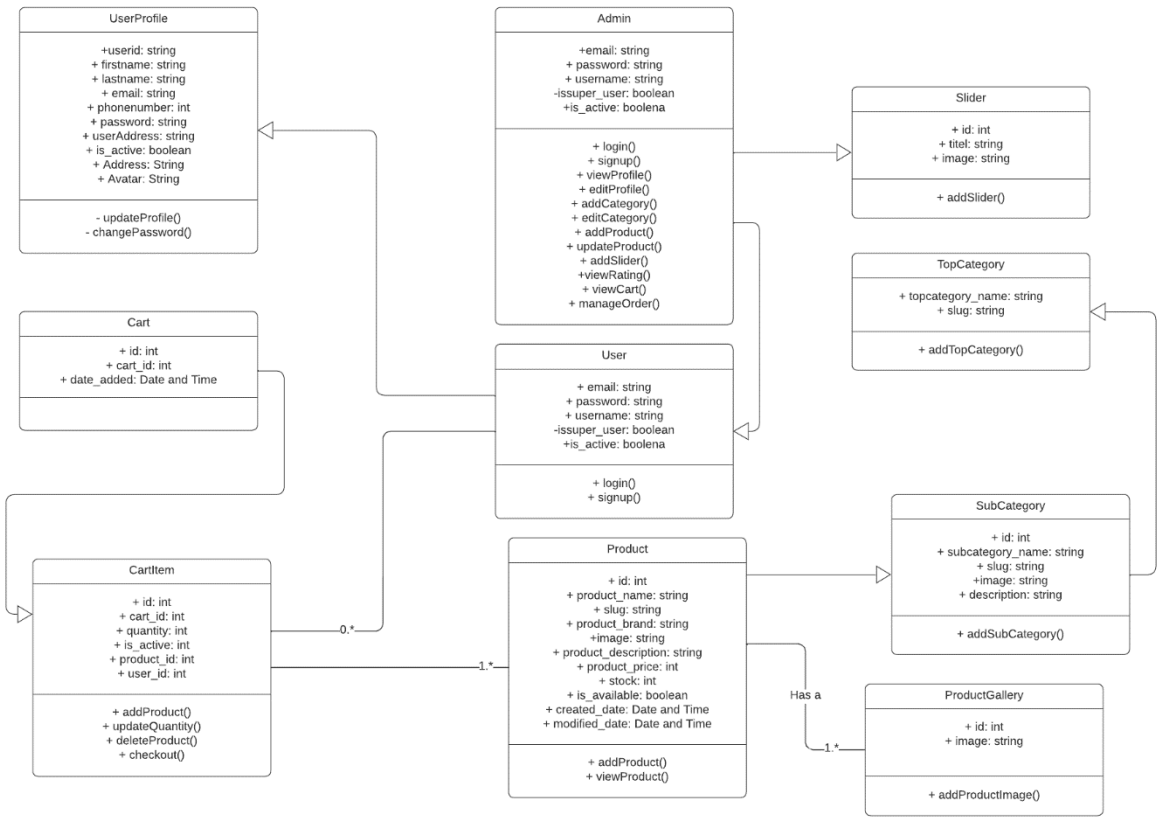


Figure 29 PRMS Class diagram

5.3.7. Class Diagram

5.4. Order Management System

In this system, we manage the order the of login user. After the product is added to cart user has option to change the product quantity or delete the product from the cart. Then, user must fill up the Shipping address and choose the payment option. Here, we are going to integrate PayPal for payments method. Where we can use PayPal credit card and PayPal digital wallet payment for payment transactions. If the user wants to order the products first, they must fill in the shipping address and they must pay through one of these options.

The following technologies that will be used to complete this system are:

Development Tools: Visual Studio Code

Programming language: Python, Django

Frontend: Bootstrap, JavaScript, and jQuery

Methodology: SCRUM

Other tools: PayPal API for payment gateway

5.4.1. Software Requirements Specification (SRS)

Req. Code	**Req. Desc**	**Use Case**	**MoSCoW Prioritization**
OMS-F-1.0	System should facilitate user to edit the product quantity in cart page.	Edit cart product	Must Have
OMS-F-2.0	System should ask user to fill up the shipping address.		Must Have
OMS-F-3.0	System should facilitate user to pay through digital wallet.	Add payment method	Must Have
OMS-NF-1.1	When making the payment user information should not store in the database.		Should Have
OMS-UR-1.1	The user must be notified when the user had successfully made the payment.		Should Have
OMS-F-4.0	System should facilitate admin to accept or cancel the order from every user.		Must Have
OMS-F-5.0	System should generate the order invoice of every product order.		Should Have

OMS-F-6.0	System should facilitate user to print order invoice.		Must Have

5.4.2. Activity Diagram

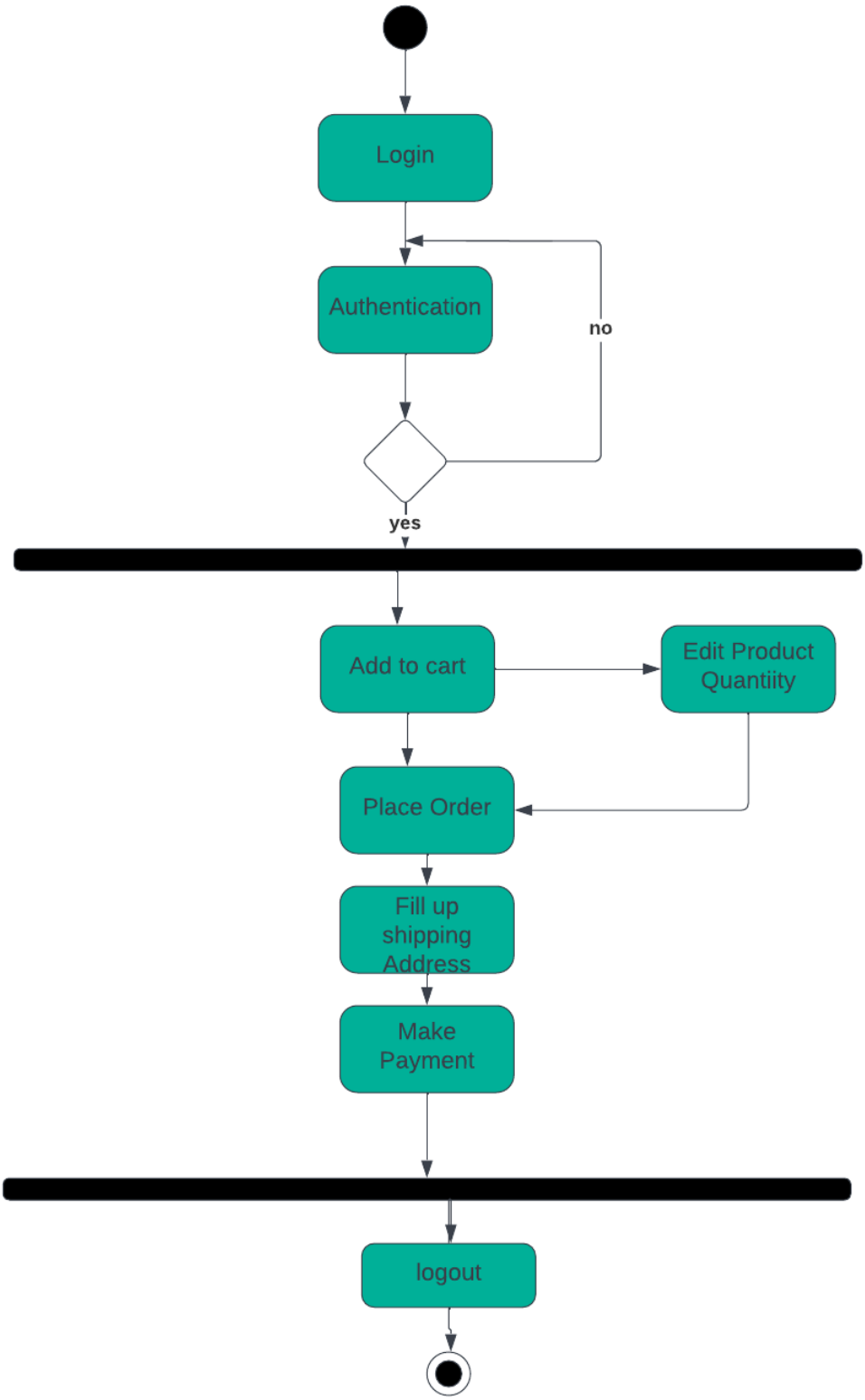


Figure 30: OMS activity diagram

5.4.3. Use Case Diagram of OMS

Figure 31: OMS Use case diagram

5.4.4. Wireframe

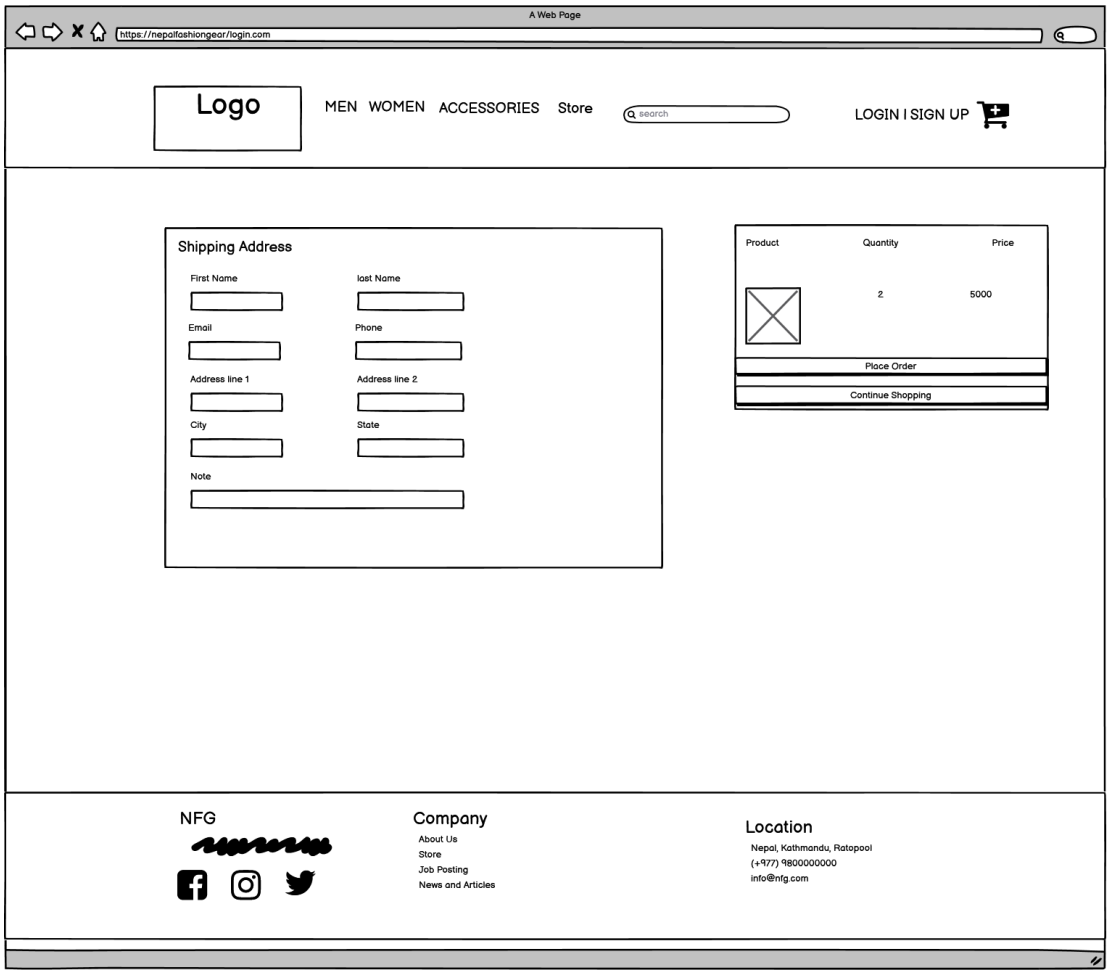


Figure 32 Checkout page

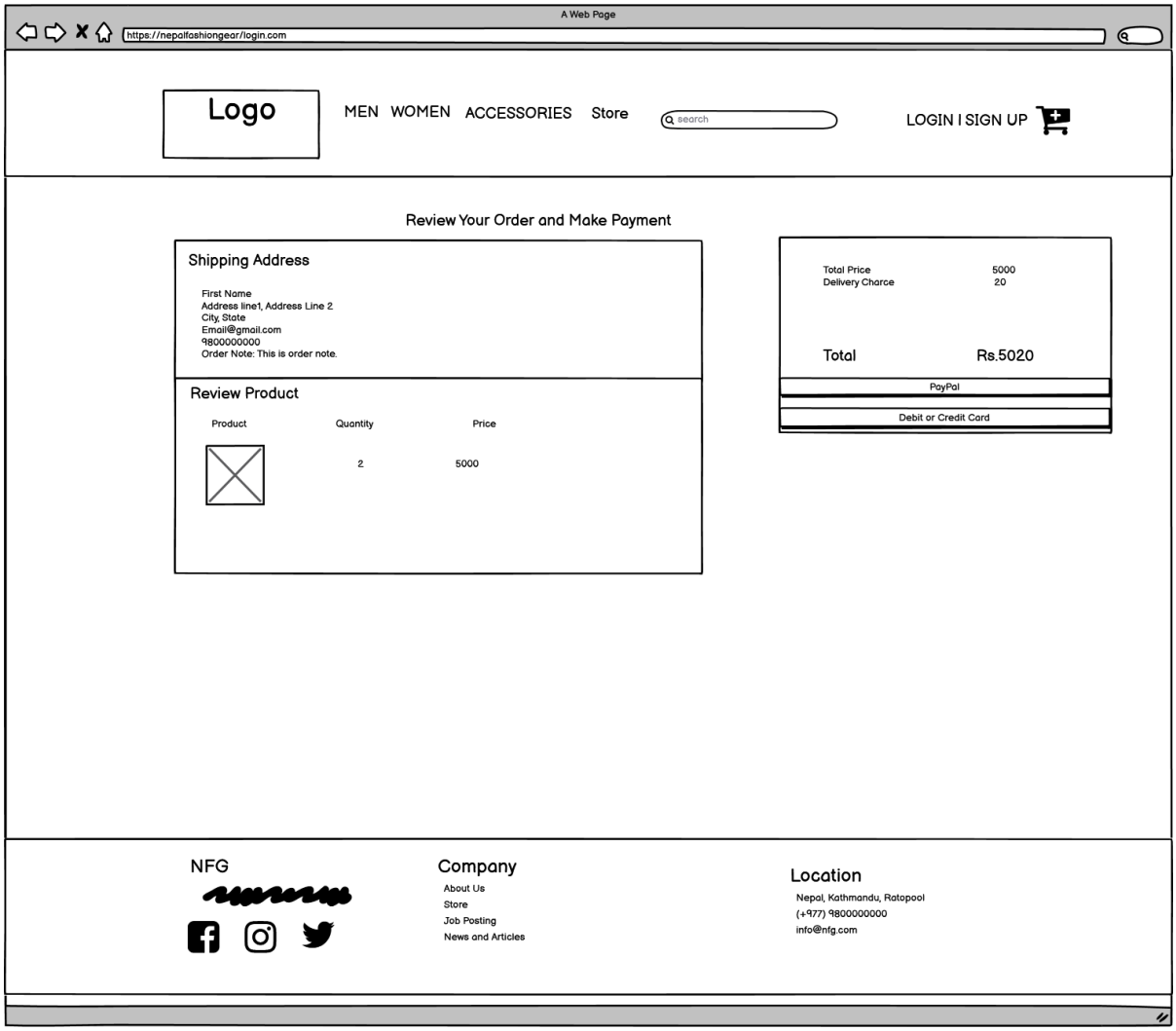


Figure 33 Place order page

5.4.5. Entity Relationship Diagram

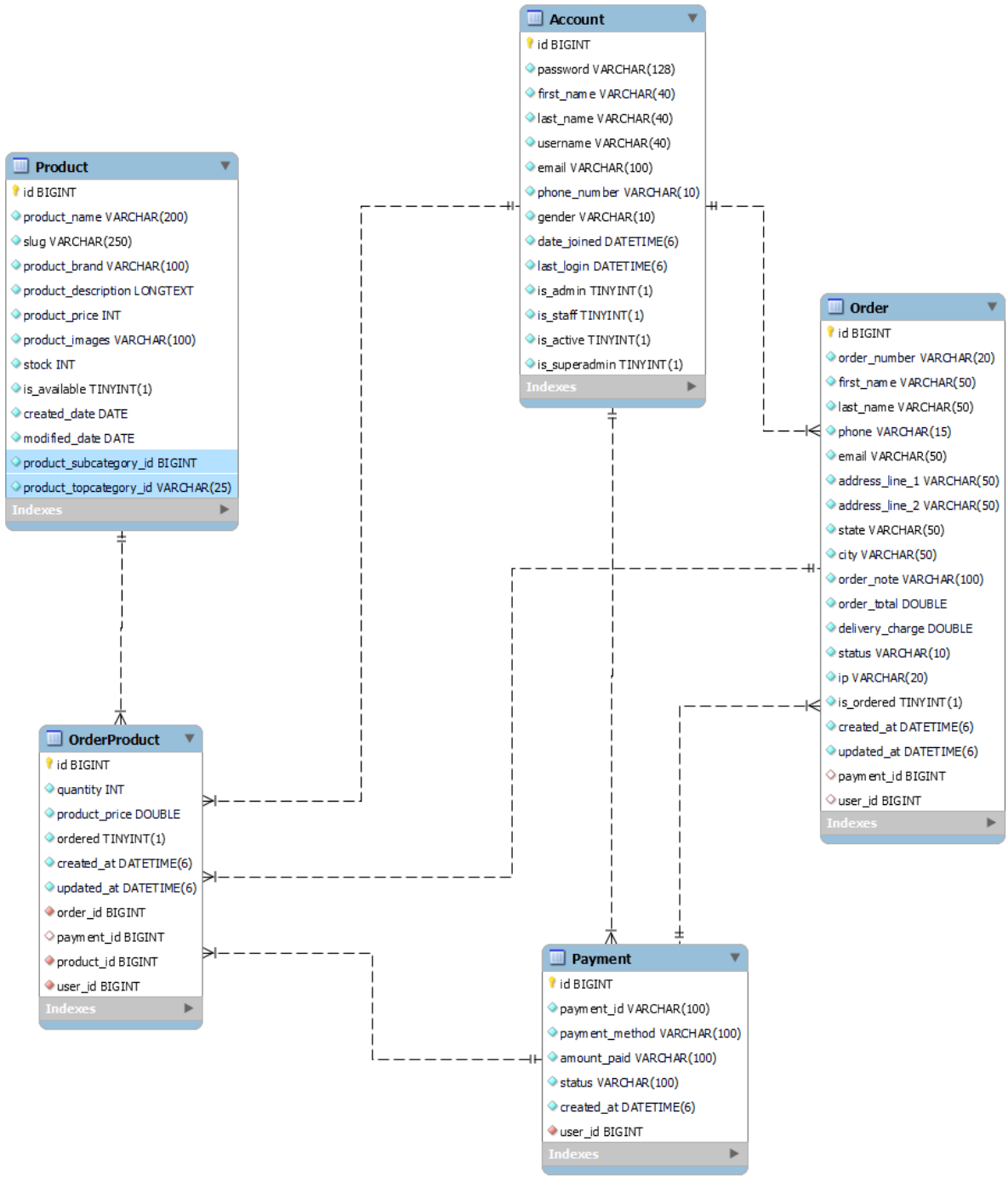


Figure 34: RED of OMS

5.4.6. Class Diagram

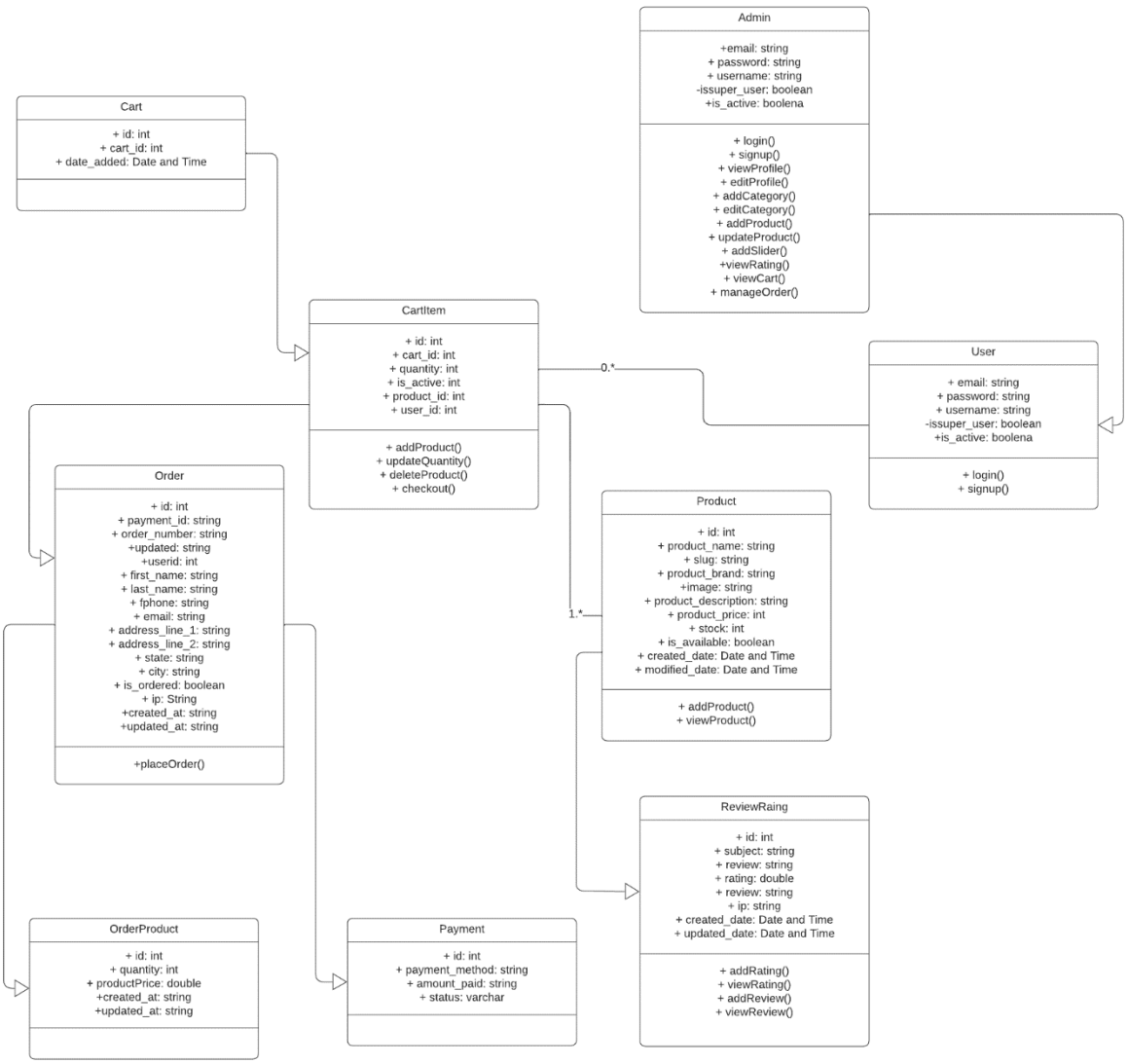


Figure 35 OMS Class diagram

5.5. Data Dictionary Diagram

Table Name	Column Name	Key	Data Type	Nullable
Account	id	PK	bigint(19)	No
Account	password		varchar(128)	No
Account	first_name		varchar(40)	No
Account	last_name		varchar(40)	No
Account	username	UK	varchar(40)	No
Account	email	UK	varchar(100)	No
Account	phone_number		varchar(10)	No
Account	gender		varchar(10)	No

Account	date_joined		datetime(8)	No
Account	last_login		datetime(8)	No
Account	is_admin		tinyint(3)	No
Account	is_staff		tinyint(3)	No
Account	is_active		tinyint(3)	No
Account	is_superadmin		tinyint(3)	No
Userprofile	id	PK	bigint(19)	No
Userprofile	profile_picture		varchar(100)	No
Userprofile	address_line_1		varchar(100)	No
Userprofile	address_line_2		varchar(100)	No
Userprofile	city		varchar(20)	No
Userprofile	state		varchar(20)	No
Userprofile	user_id	FK,UK	bigint(19)	No
Cart	id	PK	bigint(19)	No
Cart	cart_id		varchar(250)	No
Cart	date_added		date(3)	No
CartItem	id	PK	bigint(19)	No
CartItem	quantity		int(10)	No
CartItem	is_active		tinyint(3)	No
CartItem	cart_id	FK	bigint(19)	Yes
CartItem	product_id	FK	bigint(19)	No
CartItem	user_id	FK	bigint(19)	Yes
SubCategory	id	PK	bigint(19)	No
SubCategory	subcategory_name	UK	varchar(50)	No
SubCategory	slug	UK	varchar(50)	No
SubCategory	description		longtext(4294967295)	No
SubCategory	subcatgory_image		varchar(100)	No
SubCategory	topcategory_name_id	FK	varchar(25)	No
TopCategory	topcategory_name	PK	varchar(25)	No
TopCategory	slug	UK	varchar(50)	No
Order	id	PK	bigint(19)	No
Order	order_number		varchar(20)	No
Order	first_name		varchar(50)	No
Order	last_name		varchar(50)	No
Order	phone		varchar(15)	No
Order	email		varchar(50)	No
Order	address_line_1		varchar(50)	No
Order	address_line_2		varchar(50)	No
Order	state		varchar(50)	No
Order	city		varchar(50)	No
Order	order_note		varchar(100)	No

Order	order_total		double(22)	No
Order	delivery_charge		double(22)	No
Order	status		varchar(10)	No
Order	ip		varchar(20)	No
Order	is_ordered		tinyint(3)	No
Order	created_at		datetime(8)	No
Order	updated_at		datetime(8)	No
Order	payment_id	FK	bigint(19)	Yes
Order	user_id	FK	bigint(19)	Yes
OrderProduct	id	PK	bigint(19)	No
OrderProduct	quantity		int(10)	No
OrderProduct	product_price		double(22)	No
OrderProduct	ordered		tinyint(3)	No
OrderProduct	created_at		datetime(8)	No
OrderProduct	updated_at		datetime(8)	No
OrderProduct	order_id	FK	bigint(19)	No
OrderProduct	payment_id	FK	bigint(19)	Yes
OrderProduct	product_id	FK	bigint(19)	No
OrderProduct	user_id	FK	bigint(19)	No
Payment	id	PK	bigint(19)	No
Payment	payment_id		varchar(100)	No
Payment	payment_method		varchar(100)	No
Payment	amount_paid		varchar(100)	No
Payment	status		varchar(100)	No
Payment	created_at		datetime(8)	No
Payment	user_id	FK	bigint(19)	No
Product	id	PK	bigint(19)	No
Product	product_name	UK	varchar(200)	No
Product	slug	UK	varchar(250)	No
Product	product_brand		varchar(100)	No
Product	product_description		longtext(4294967295)	No
Product	product_price		int(10)	No
Product	product_images		varchar(100)	No
Product	stock		int(10)	No
Product	is_available		tinyint(3)	No
Product	created_date		date(3)	No
Product	modified_date		date(3)	No
Product	product_subcategory_id	FK	bigint(19)	No
Product	product_topcategory_id	FK	varchar(25)	No
ProductGallery	id	PK	bigint(19)	No
ProductGallery	image		varchar(255)	No

ProductGallery	product_id	FK	bigint(19)	No
ReviewRating	id	PK	bigint(19)	No
ReviewRating	subject		varchar(100)	No
ReviewRating	review		longtext(4294967295)	No
ReviewRating	rating		double(22)	No
ReviewRating	ip		varchar(20)	No
ReviewRating	status		tinyint(3)	No
ReviewRating	created_at		datetime(8)	No
ReviewRating	updated_at		datetime(8)	No
ReviewRating	product_id	FK	bigint(19)	No
ReviewRating	user_id	FK	bigint(19)	No
Slider	id	PK	bigint(19)	No
Slider	image		varchar(100)	No
Slider	title		varchar(50)	No
Variation	id	PK	bigint(19)	No
Variation	variation_category		varchar(50)	No
Variation	variation_value		varchar(100)	No
Variation	is_active		tinyint(3)	No
Variation	created_date		datetime(8)	No
Variation	product_id	FK	bigint(19)	No

5.6. Overall System Diagram

5.6.1. ERD Diagram

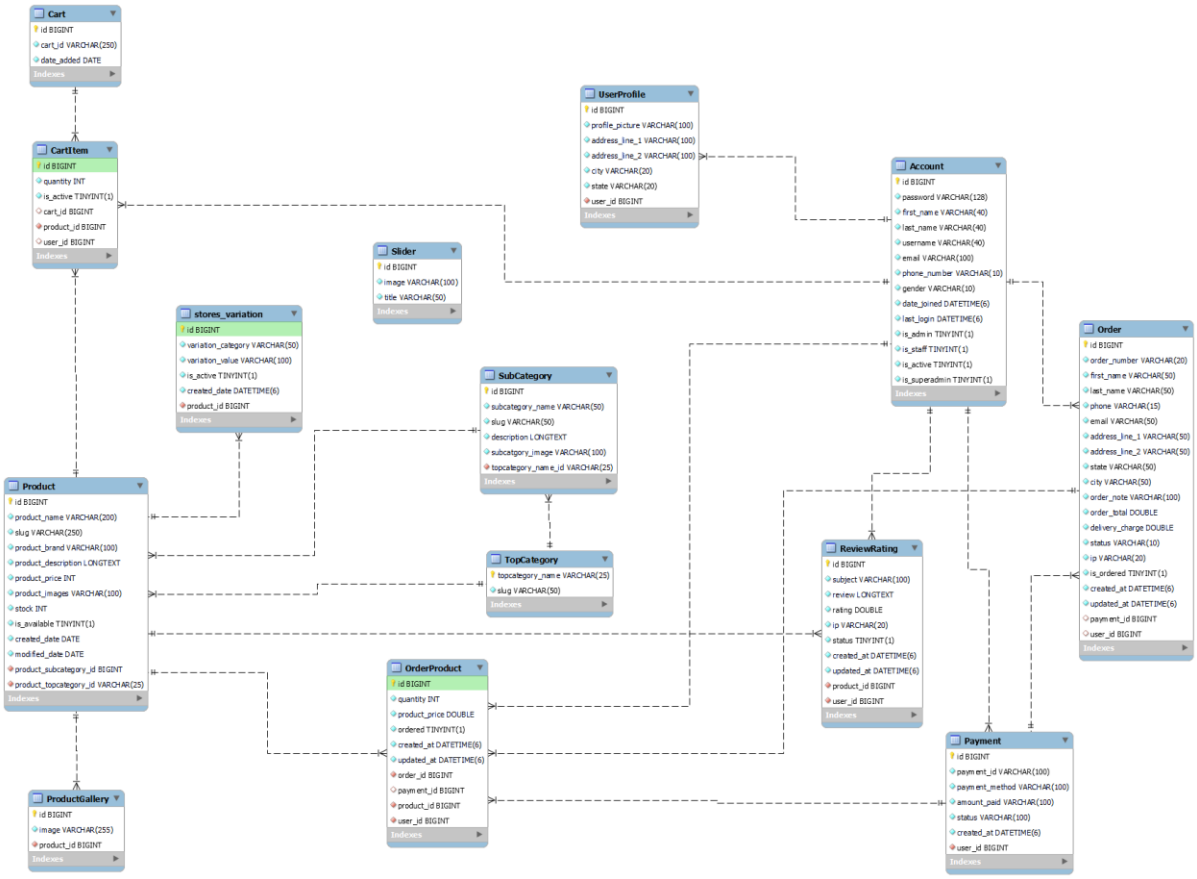


Figure 36: Overall ERD of NFG

5.6.2. Sequence Diagram

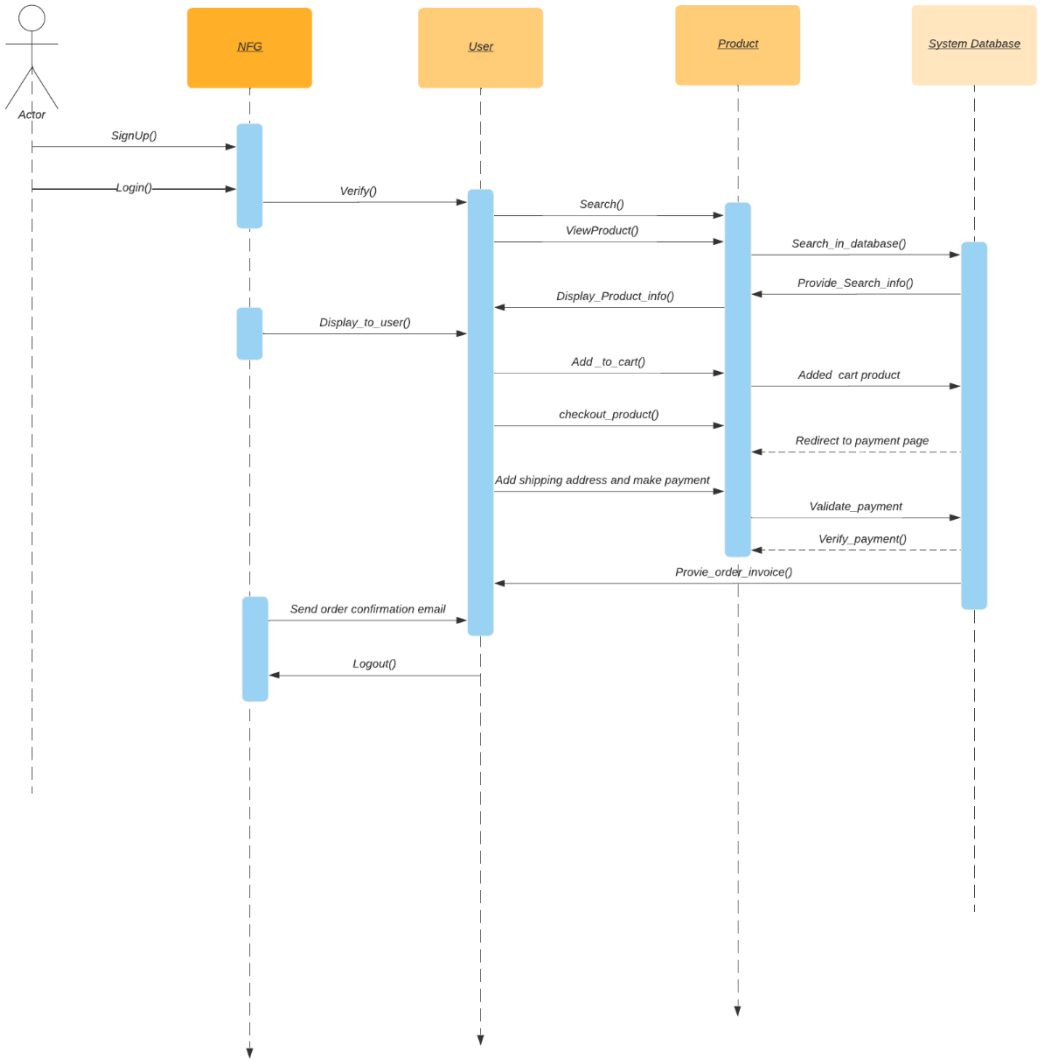


Figure 37: Overall Sequence diagram of NFG

5.6.3. Class Diagram

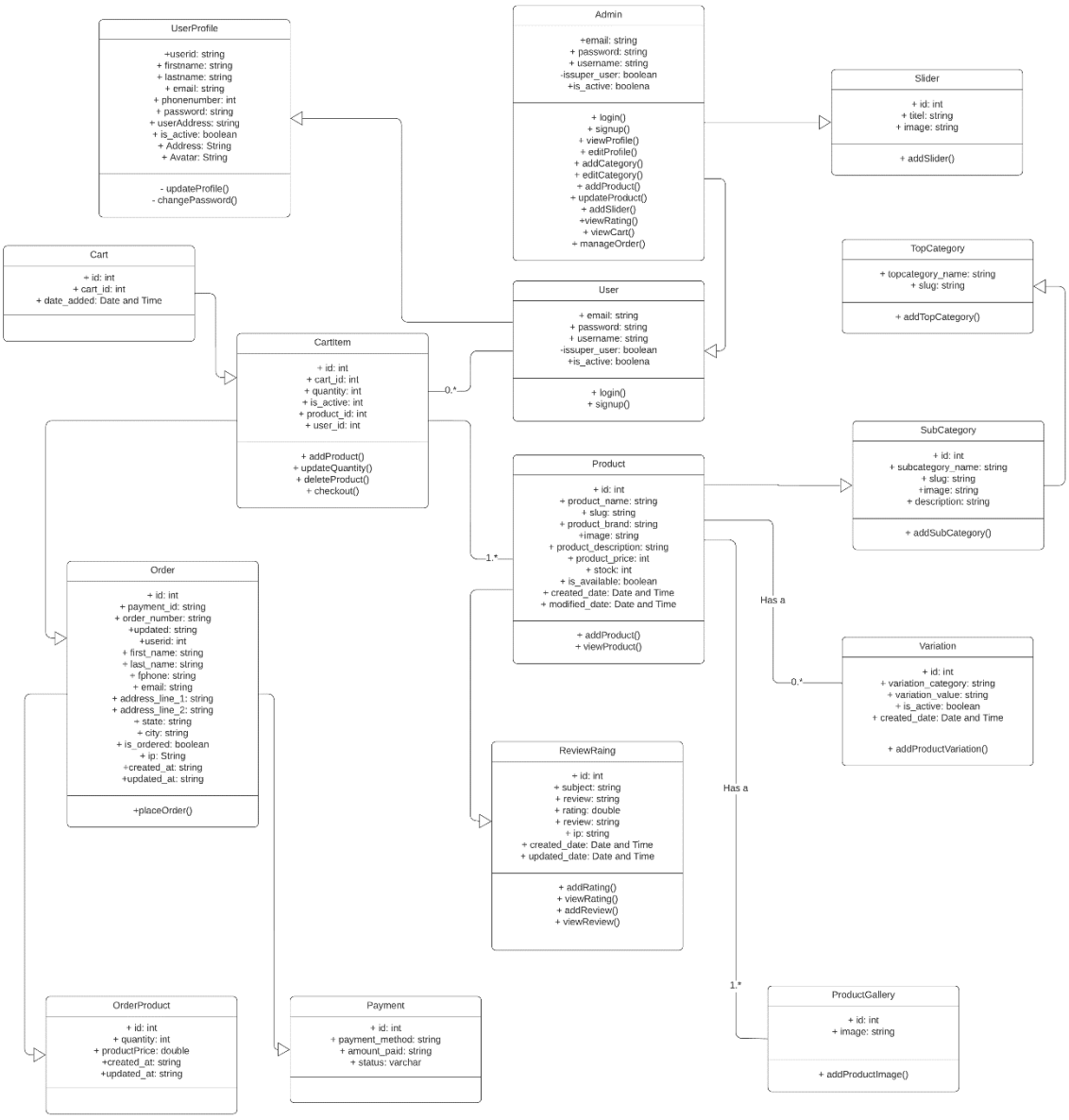


Figure 38: Overall Class diagram of NFG

5.6.4. Activity Diagram

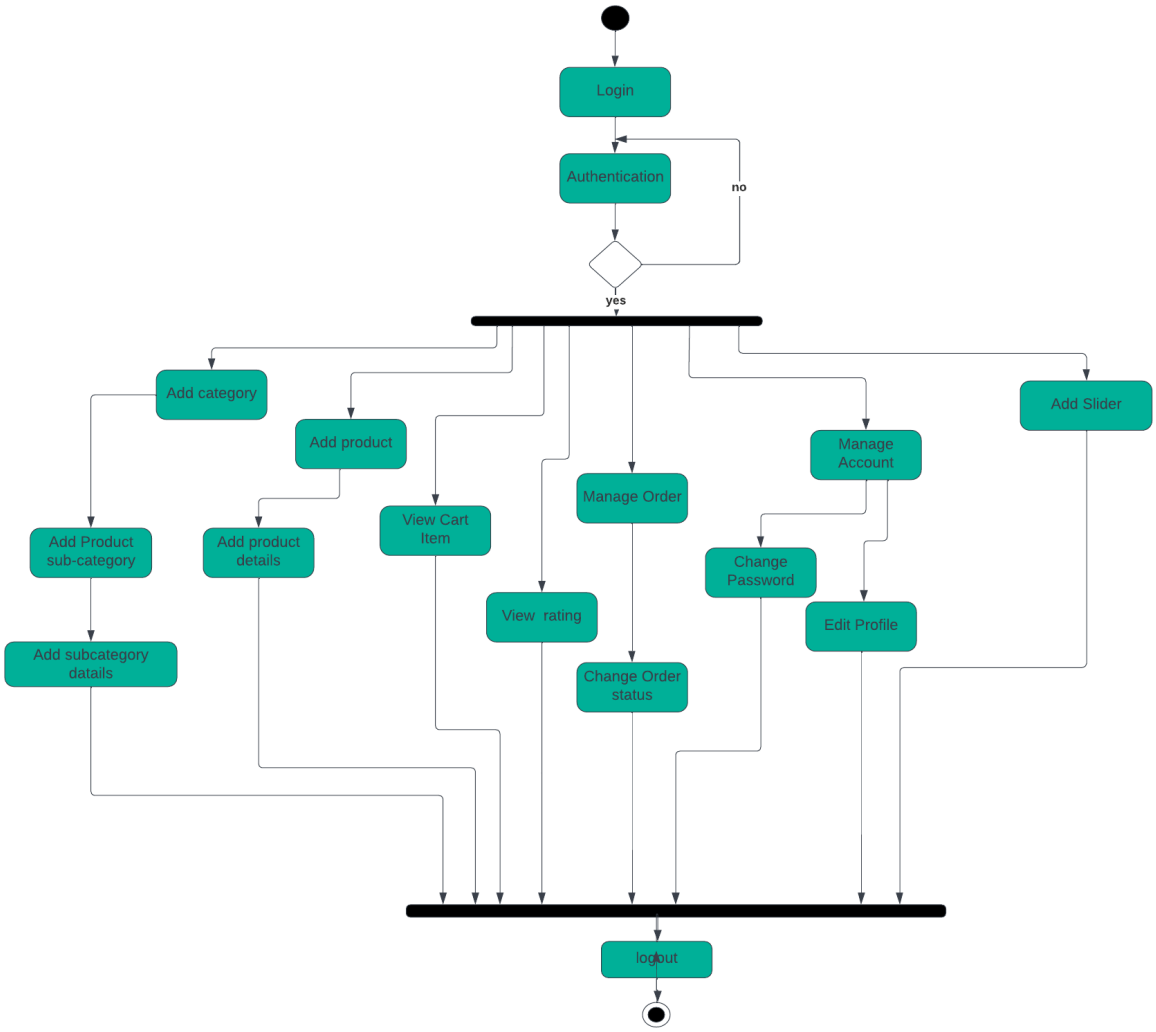


Figure 39: Overall Activity diagram of NFG for admin

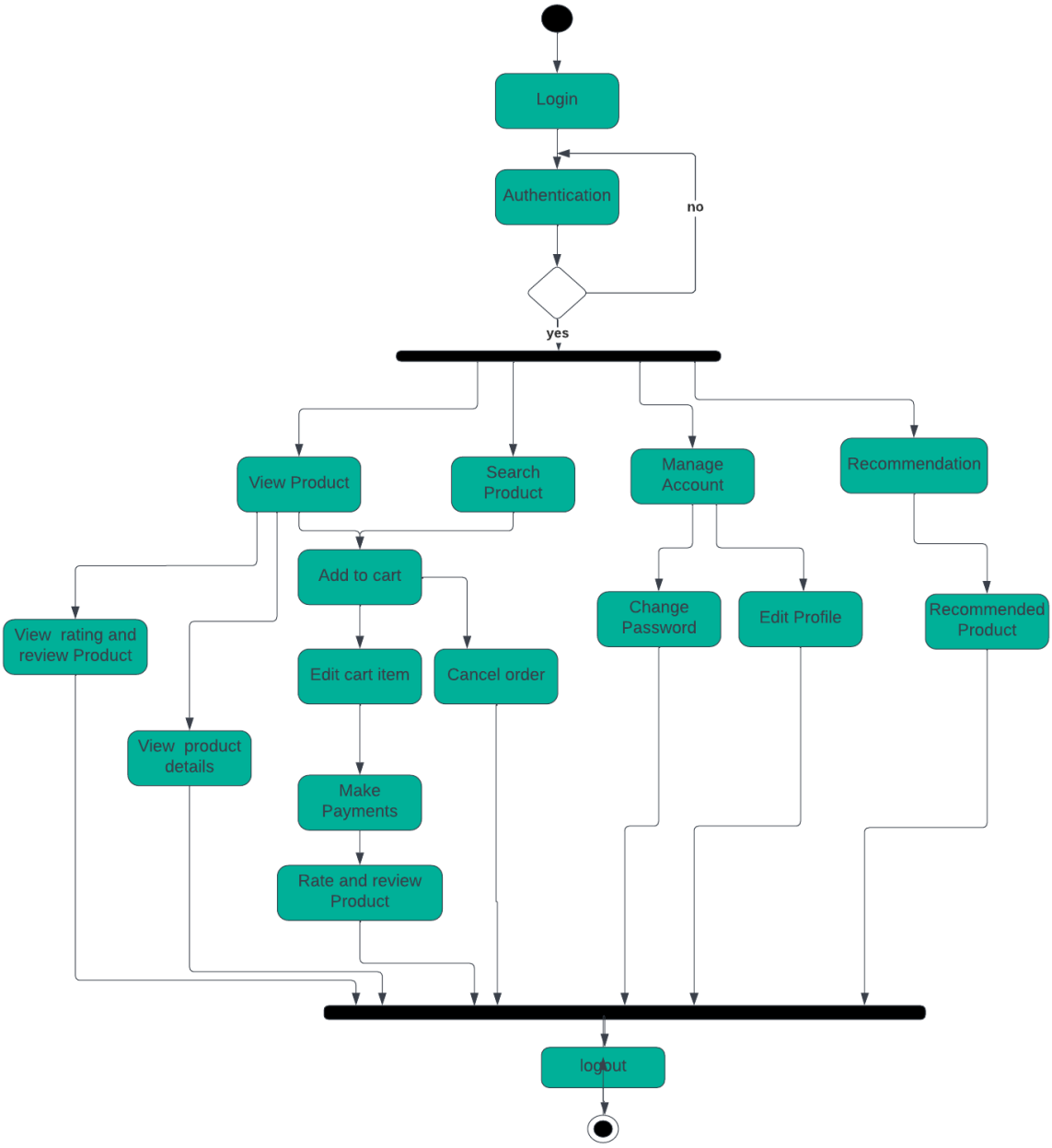


Figure 40: Overall Activity diagram of NFG for user

5.6.5. Use Case Diagram

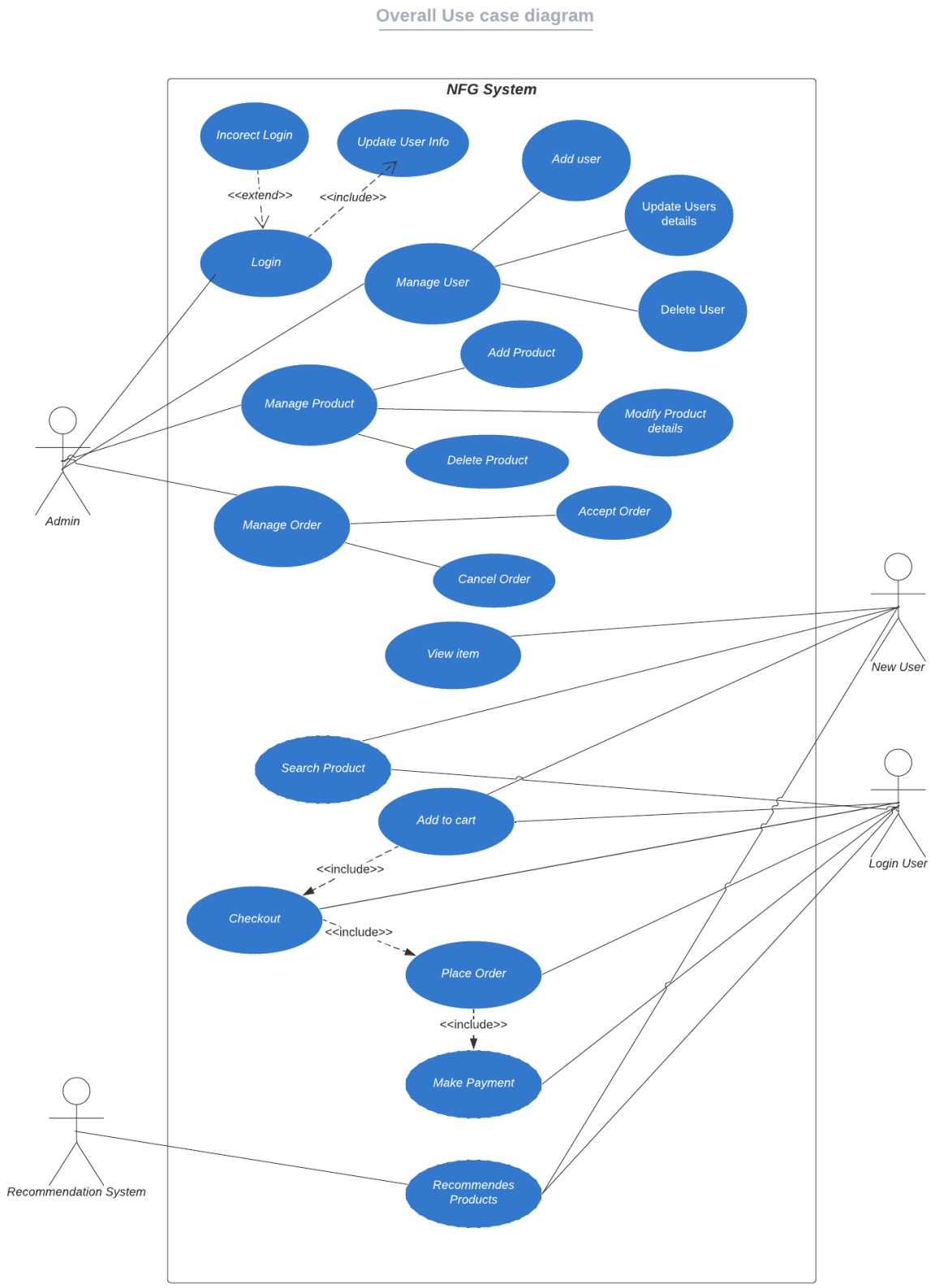


Figure 41: Overall Use case diagram of NFG

5.7. Recommender Model

The recommendation model is one of the important parts of this system. For this we going to use item base collaborative filtering to recommend similar kinds of products that are bought and highly rated by the users. Item based collaborative filtering is a kind of recommendation system that look over the similar kinds of product based on the whether user had positively interacted with product. To build the recommendation system for our system we start with collecting the suitable data.

5.7.1. Data Collection

As our system is ecommerce website try to sell the wearable clothes. We need to collect only certain category of data. We found suitable data in Kaggle which consist of the fashion related data from the website Myntra. It consists of the around forty-four thousand data and all the data is not suitable for our system. It consists of the multiple level of category of product where our system only has the two level of category. So, we need to clean the data and process the data based on our model.

```
In [1]: import numpy as np
        import pandas as pd
        import warnings
        warnings.filterwarnings("ignore")

In [2]: df = pd.read_csv("styles.csv", error_bad_lines=False)
        df.head()
```

```
b'Skipping line 6044: expected 10 fields, saw 11\nSkipping line 6569: expected 10 fields, saw 11\nSkipping line 7399: expected
10 fields, saw 11\nSkipping line 7939: expected 10 fields, saw 11\nSkipping line 9026: expected 10 fields, saw 11\nSkipping lin
e 10264: expected 10 fields, saw 11\nSkipping line 10427: expected 10 fields, saw 11\nSkipping line 10905: expected 10 fields,
saw 11\nSkipping line 11373: expected 10 fields, saw 11\nSkipping line 11945: expected 10 fields, saw 11\nSkipping line 14112:
expected 10 fields, saw 11\nSkipping line 14532: expected 10 fields, saw 11\nSkipping line 15076: expected 10 fields, saw 12\nS
kipping line 29906: expected 10 fields, saw 11\nSkipping line 31625: expected 10 fields, saw 11\nSkipping line 33020: expected
10 fields, saw 11\nSkipping line 35748: expected 10 fields, saw 11\nSkipping line 35962: expected 10 fields, saw 11\nSkipping l
ine 37770: expected 10 fields, saw 11\nSkipping line 38105: expected 10 fields, saw 11\nSkipping line 38275: expected 10 field
s, saw 11\nSkipping line 38404: expected 10 fields, saw 12\n'
```

Out[2]:

	id	gender	masterCategory	subCategory	articleType	baseColour	season	year	usage	productDisplayName
0	15970	Men	Apparel	Topwear	Shirts	Navy Blue	Fall	2011.0	Casual	Turtle Check Men Navy Blue Shirt
1	39386	Men	Apparel	Bottomwear	Jeans	Blue	Summer	2012.0	Casual	Peter England Men Party Blue Jeans
2	59263	Women	Accessories	Watches	Watches	Silver	Winter	2016.0	Casual	Titan Women Silver Watch
3	21379	Men	Apparel	Bottomwear	Track Pants	Black	Fall	2011.0	Casual	Manchester United Men Solid Black Track Pants
4	53759	Men	Apparel	Topwear	Tshirts	Grey	Summer	2012.0	Casual	Puma Men Grey T-shirt

```
In [3]: df = df[['id', 'masterCategory', 'gender', 'subCategory', 'articleType', 'baseColour', 'season', 'year', 'usage', 'productDisplay
        df
```

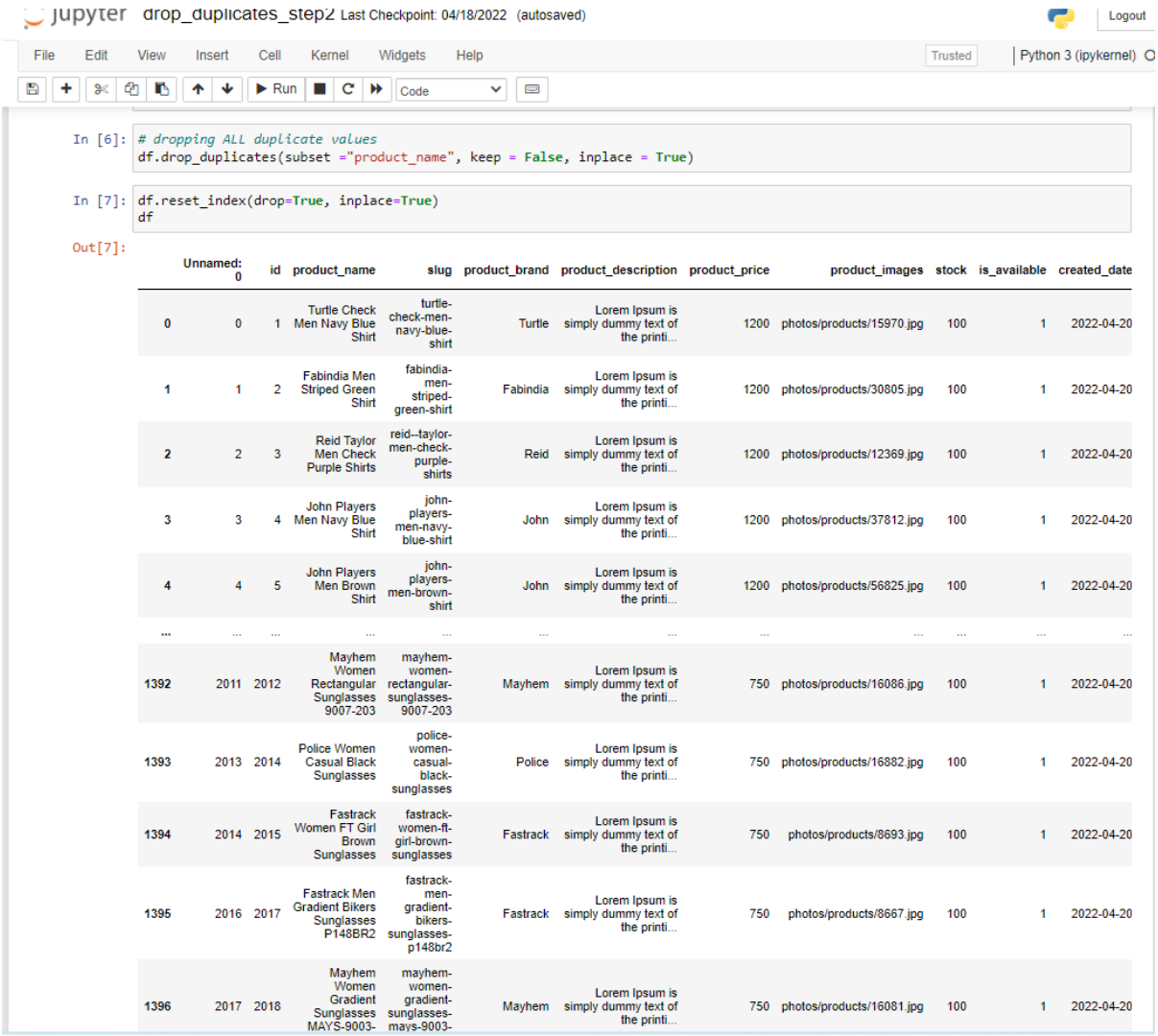
Out[3]:

	id	masterCategory	gender	subCategory	articleType	baseColour	season	year	usage	productDisplayName
0	15970	Apparel	Men	Topwear	Shirts	Navy Blue	Fall	2011.0	Casual	Turtle Check Men Navy Blue Shirt
1	39386	Apparel	Men	Bottomwear	Jeans	Blue	Summer	2012.0	Casual	Peter England Men Party Blue Jeans
2	59263	Accessories	Women	Watches	Watches	Silver	Winter	2016.0	Casual	Titan Women Silver Watch
3	21379	Apparel	Men	Bottomwear	Track Pants	Black	Fall	2011.0	Casual	Manchester United Men Solid Black Track Pants
4	53759	Apparel	Men	Topwear	Tshirts	Grey	Summer	2012.0	Casual	Puma Men Grey T-shirt
...	...	...	...	...	...	...	...	...	...	...
44419	17036	Footwear	Men	Shoes	Casual Shoes	White	Summer	2013.0	Casual	Gas Men Caddy Casual Shoe
44420	6461	Footwear	Men	Flip Flops	Flip Flops	Red	Summer	2011.0	Casual	Lotto Men's Soccer Track Flip Flop
44421	18842	Apparel	Men	Topwear	Tshirts	Blue	Fall	2011.0	Casual	Puma Men Graphic Stellar Blue Tshirt
44422	46694	Personal Care	Women	Fragrance	Perfume and Body Mist	Blue	Spring	2017.0	Casual	Rasasi Women Blue Lady Perfume
44423	51623	Accessories	Women	Watches	Watches	Pink	Winter	2016.0	Casual	Fossil Women Pink Dial Chronograph Watch ES3050

44424 rows × 10 columns

Figure 42: Show data in using pandas dataframe

Similarly, we our data-based model have some important field of data like product brand and product descriptions which is missing in the above dataset. So, we make brand column using the first name of product and similarly, we fill the product description column with some random text. As our AI model is dependent on the product name and rating, we just fill others remaining column with random values and reshape the data based on database model. Later we drop the duplicate data and reindex the data.



	Unnamed: 0	id	product_name	slug	product_brand	product_description	product_price	product_images	stock	is_available	created_date
0	0	1	Turtle Check Men Navy Blue Shirt	turtle-check-men-navy-blue-shirt	Turtle	Lorem Ipsum is simply dummy text of the printi...	1200	photos/products/15970.jpg	100	1	2022-04-20
1	1	2	Fabindia Men Striped Green Shirt	fabindia-men-striped-green-shirt	Fabindia	Lorem Ipsum is simply dummy text of the printi...	1200	photos/products/30805.jpg	100	1	2022-04-20
2	2	3	Reid Taylor Men Check Purple Shirts	reid--taylor-men-check-purple-shirts	Reid	Lorem Ipsum is simply dummy text of the printi...	1200	photos/products/12369.jpg	100	1	2022-04-20
3	3	4	John Players Men Navy Blue Shirt	john-players-men-navy-blue-shirt	John	Lorem Ipsum is simply dummy text of the printi...	1200	photos/products/37812.jpg	100	1	2022-04-20
4	4	5	John Players Men Brown Shirt	john-players-men-brown-shirt	John	Lorem Ipsum is simply dummy text of the printi...	1200	photos/products/56825.jpg	100	1	2022-04-20
...	...	...	...	...	...	...	...	...	...	...	...
1392	2011	2012	Mayhem Women Rectangular Sunglasses 9007-203	mayhem-women-rectangular-sunglasses-9007-203	Mayhem	Lorem Ipsum is simply dummy text of the printi...	750	photos/products/16086.jpg	100	1	2022-04-20
1393	2013	2014	Police Women Casual Black Sunglasses	police-women-casual-black-sunglasses	Police	Lorem Ipsum is simply dummy text of the printi...	750	photos/products/16882.jpg	100	1	2022-04-20
1394	2014	2015	Fastrack Women FT Girl Brown Sunglasses	fastrack-women-ft-girl-brown-sunglasses	Fastrack	Lorem Ipsum is simply dummy text of the printi...	750	photos/products/8693.jpg	100	1	2022-04-20
1395	2016	2017	Fastrack Men Gradient Bikers Sunglasses P148BR2	fastrack-men-gradient-bikers-sunglasses-p148br2	Fastrack	Lorem Ipsum is simply dummy text of the printi...	750	photos/products/8667.jpg	100	1	2022-04-20
1396	2017	2018	Mayhem Women Gradient Sunglasses MAYS-9003-	mayhem-women-gradient-sunglasses-mays-9003-	Mayhem	Lorem Ipsum is simply dummy text of the printi...	750	photos/products/16081.jpg	100	1	2022-04-20

Figure 43: Drop the duplicate data

5.7.2. Model Development

For the Item based collaborative model development we use cosine similarity to calculate the similarity of product and use K-nearest Neighbor to calculate the nearest distance and to provide the recommendation based on that. Before directly going to build the model

development. At this point we have imported our csv data of product and rating in the databased. So, we need to load the data from the data base.

```
In [1]: import warnings
        warnings.simplefilter(action='ignore')
```

```
In [15]: import pandas as pd
         import pymysql
         connection = pymysql.connect(host='127.0.0.1',port=int(3306),user='root',password='root',db='newnfg')
         ratings = pd.read_sql_query("SELECT * from stores_reviewrating", connection)
         products = pd.read_sql_query("SELECT * from stores_product", connection)
         products
         ratings
```

Out[15]:

	id	subject	review	rating	ip	status	created_at	updated_at	product_id	user_id
0	1	Test Title	Test Review	5.0	127.0.0.1	1	2022-04-20 17:55:14.809929	2022-04-20 17:55:14.809929	1	2
1	2	Test Title	Test Review.....	4.5	127.0.0.1	1	2022-04-20 00:00:00.000000	2022-04-21 00:00:00.000000	871	2
2	3	Test Title	Test Review	5.0	127.0.0.1	1	2022-04-20 00:00:00.000000	2022-04-20 00:00:00.000000	1	3
3	4	Test Title	Test Review	4.0	127.0.0.1	1	2022-04-20 00:00:00.000000	2022-04-20 00:00:00.000000	1	4
4	5			5.0	127.0.0.1	1	2022-04-20 00:00:00.000000	2022-04-22 11:13:12.516906	1	5
...	...	...	...	...	...	...	...	...	...	...
8264	8270	Test Title	Test review	4.5	127.0.0.1	1	2022-04-23 15:05:43.219107	2022-04-23 15:05:43.219107	789	9
8265	8271	Test Title	Test review.....	5.0	127.0.0.1	1	2022-04-23 15:07:52.935106	2022-04-23 15:07:52.935106	789	10
8266	8272	Test Title	Test review	5.0	127.0.0.1	1	2022-04-23 15:09:35.684478	2022-04-23 15:09:35.684478	789	11
8267	8273	Test Title	Test review	5.0	127.0.0.1	1	2022-04-23 15:11:17.643776	2022-04-23 15:11:17.643776	789	12
8268	8274	Test Title	Test review	5.0	127.0.0.1	1	2022-04-23 15:15:32.361951	2022-04-23 15:15:32.361951	789	7

8269 rows × 10 columns

```
In [16]: ratings.columns
```

```
Out[16]: Index(['id', 'subject', 'review', 'rating', 'ip', 'status', 'created_at',
                'updated_at', 'product_id', 'user_id'],
               dtype='object')
```

```
In [17]: ratings1=ratings.drop(columns =['subject', 'review', 'ip', 'status', 'created_at','updated_at'])
```

```
In [18]: ratings1
```

Out[18]:

	id	rating	product_id	user_id
0	1	5.0	1	2
1	2	4.5	871	2
2	3	5.0	1	3
3	4	4.0	1	4

Figure 44: Load data from the database

Now, we merge the product and rating database based on the product id and remove the remove the unnecessary columns. Then, we set the popularity threshold where rating must be greater or equal to three to recommend the product. Due to the small number of user and rating, we limit the popularity threshold only with three.

```
In [11]: import matplotlib.pyplot as plt

         plt.rc("font", size = 15)
         ratings1.rating.value_counts(sort = False).plot(kind = 'bar')
         plt.title('Rating Distribution\n')
         plt.xlabel('Rating')
         plt.ylabel('count')
         plt.show()
```

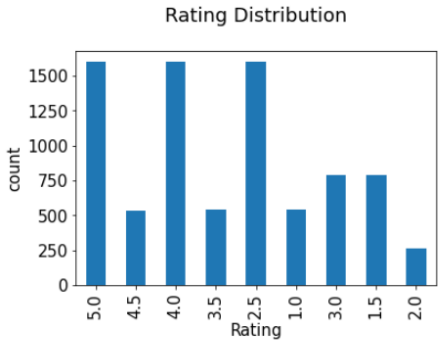


Figure 45: Rating distribution of clothes

```
In [20]: popularity_threshold = 3
         rating_popular_product = rating_with_totalCount.query('totalCount >= @popularity_threshold')
         # rating_popular_product = rating_with_totalCount
         rating_popular_product .head()
```

Out[20]:

	product_id	product_name	rating	user_id	totalCount
0	1	Turtle Check Men Navy Blue Shirt	5.0	2	6
1	1	Turtle Check Men Navy Blue Shirt	5.0	3	6
2	1	Turtle Check Men Navy Blue Shirt	4.0	4	6
3	1	Turtle Check Men Navy Blue Shirt	3.5	5	6
4	1	Turtle Check Men Navy Blue Shirt	2.5	6	6

```
In [21]: rating_popular_product.shape
Out[21]: (8266, 5)
```

Figure 46 Set popularity threshold of product based on rating

After that we convert our data product name and rating from every user to sparse matrix where we fill the missing rating with zero. To find the nearest neighbor we use unsupervised algorithms with “sklearn.neighbours”. We use cosine similarity to calculate the similarity between rating vectors and use “brute” algorithm for to calculate the nearest neighbors in given bellow model.

```
In [22]: from scipy.sparse import csr_matrix

         product_features_df = rating_popular_product.pivot_table(index='product_name',columns='user_id',values='rating').fillna(0)
         # Convert to csr matrix
         product_features_df_matrix = csr_matrix(product_features_df.values)

         # Pivot Table
         product_features_df.head()
```

Out[22]:

user_id	2	3	4	5	6	7	8	9	10	11	12
product_name											
ADIDAS Men Badge PO Black Sweaters	0.0	5.0	4.0	3.5	2.5	1.0	0.0	0.0	0.0	0.0	0.0
ADIDAS Men Badge PO Grey Sweaters	0.0	5.0	4.0	3.5	2.5	1.0	0.0	0.0	0.0	0.0	0.0
ADIDAS Men Bayern Munchen Red Jersey	0.0	5.0	4.0	3.5	2.5	1.0	0.0	0.0	0.0	0.0	0.0
ADIDAS Men Black Jersey	0.0	5.0	4.0	3.5	2.5	1.0	0.0	0.0	0.0	0.0	0.0
ADIDAS Men Check Black Sweaters	0.0	5.0	4.0	3.5	2.5	1.0	0.0	0.0	0.0	0.0	0.0

```
In [23]: from sklearn.neighbors import NearestNeighbors

         model_knn = NearestNeighbors(metric = 'cosine', algorithm = 'brute')
         model_knn.fit(product_features_df_matrix)
Out[23]: NearestNeighbors(algorithm='brute', metric='cosine')

In [24]: product_features_df.shape
Out[24]: (1073, 11)

In [25]: product_features_df.index[5]
Out[25]: 'ADIDAS Men Frnt Str Black Sweaters'

In [26]: import numpy as np

         query_index = np.random.choice(product_features_df.shape[0])
         print(query_index)
         distances, indices = model_knn.kneighbors(product_features_df.iloc[query_index,:].values.reshape(1, -1), n_neighbors = 6)

         1014
```

Figure 47: Sparce Matrix and recommendation model.

5.7.3. Implementation of AI in the system

After we dump the recommendation model in pickle file. We make the recommendation function and read the pickle file using the python “Joblib” libraries. Similarly, in product details page we call recommendation function and pass the current product name. Where recommendation function returns the list of six nearest product that is similar to that product based on rating. Which is display in the product details page.

```
def recommendation(product_name):
    filename = 'model_pickle.pkl'
    mdl = joblib.load(filename)
    df = pd.read_csv("complete.csv")
    df = df.set_index("product_name")
    distances, indices = mdl.kneighbors(df.loc[product_name,:].values.reshape(1, -1), n_neighbors = 6)
    ind = indices.flatten()
    dist = distances.flatten()
    recommendated_product = []
    for i in range(0, len(distances.flatten())):
        if i == 0:
            pass
        else:
            recommendated_product.append(df.index[ind[i]])
    return recommendated_product


def product_details(request, subcategory_slug, product_slug):
    try:
        single_product = Product.objects.get(
            product_subcategory__slug=subcategory_slug, slug=product_slug)
        # cart__cart_id here cart is the foreign key of CartItem. We will access the cart first with the help of that we will access the cart id
        in_cart = CartItem.objects.filter(cart__cart_id=_cart_id(
            request), product=single_product).exists()
        # return HttpResponse(in_cart)
        # exit()
    except Exception as e:
        raise e

    product_name = single_product.product_name
    obj_list = []
    print(product_name)
    try:
        products = recommendation(product_name)
        print(products)
        for i in products:
            obj = Product.objects.get(product_name = i)
            obj_list.append(obj)

    except:
        print("something went wrong")
```

Figure 48: Implementation of recommendation system in NFG

5.7.4. Testing of Recommendation model

For testing of model, we pass the Product name “Forever New Women Stone Cream Jacket” in recommendation function. Which return the list of nearest products that is similar to that product based on rating with the distance and index value of products.

```
In [26]: import numpy as np

         query_index = np.random.choice(product_features_df.shape[0])
         print(query_index)
         distances, indices = model_knn.kneighbors(product_features_df.iloc[query_index,:].values.reshape(1, -1), n_neighbors = 6)

         1014

In [27]: product_features_df.index[query_index]

Out[27]: 'United Colors of Benetton Women Solid Coffee Brown Wallets'

In [28]: def function(product_name):
             distances, indices = model_knn.kneighbors(product_features_df.loc[product_name,:].values.reshape(1, -1), n_neighbors = 6)
             return distances, indices

In [42]: product_name = input("Enter a Product name: ")

         Enter a Product name: Forever New Women Stone Cream Jacket

In [43]: #product_name = "sOliver Men Solid Purple Sweater"
         distances, indices = function(product_name)
         ind = indices.flatten()
         dist = distances.flatten()

         recommendated_product = []
         for i in range(0, len(distances.flatten())):
             if i == 0:
         #         print('Recommendations for {0}:\n'.format(product_features_df.index[query_index]))
                 print(f'Recommendations for {product_name}:\n')

             else:
         #         print('{0}: {1}, with distance of : {2}'.format(i, product_features_df.index[indices.flatten()[i]], distances.flatten()
                 print(f'{i}: {product_features_df.index[ind[i]]}, with distance of : {dist[i]}')
                 recommendated_product.append(product_features_df.index[ind[i]])

         Recommendations for Forever New Women Stone Cream Jacket:

         1: Mod-acc Women Purple Handbag, with distance of : 0.10340894840558568
         2: Spice Art Women Spacious Brown Handbag, with distance of : 0.10340894840558568
         3: United Colors of Benetton Women Solid Maroon Handbags, with distance of : 0.10340894840558568
         4: United Colors of Benetton Women Grey Bag, with distance of : 0.10340894840558568
         5: Mod-acc Women Red Handbag, with distance of : 0.10340894840558568

In [44]: distances.flatten()

Out[44]: array([1.11022302e-16, 1.03408948e-01, 1.03408948e-01, 1.03408948e-01,
                1.03408948e-01, 1.03408948e-01])
```

Figure 49: Test of recommendation system in Jupyter notebook.

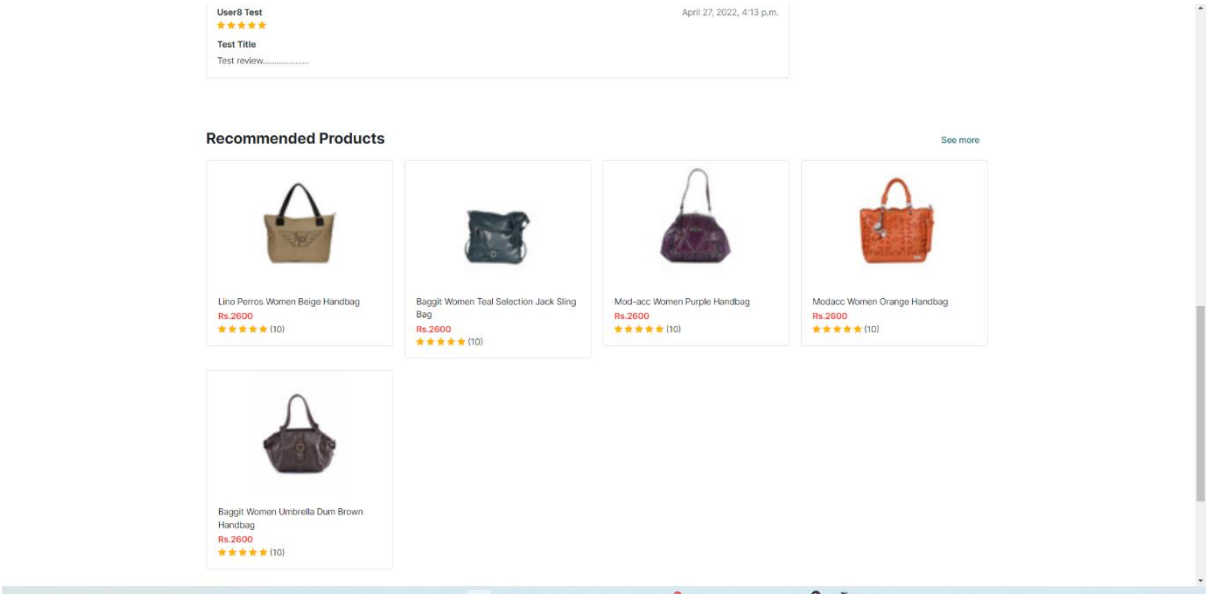


Figure 50: Test of recommendation system in product details page.

6. Testing

UI testing, often known as GUI testing, is a method of evaluating the features of any software with which a user will interact. This typically include checking the visual components for operation and performance. First, look at how the app handles keyboard, mouse, and other input device actions. The second step is to double-check that all visual elements are visible and functional. User interface testing assures that user interface operations are free of bugs. Observing and evaluating these interactions allows you to spot problems and flaws that might otherwise go unnoticed.

6.1. Invalid User Credential

S. No	Action	Input	Expected Output	Actual Output	Test Result
1	Enter re-type wrong.	First name: Samrat Last name: Bogati Email: Creaturegaming4@gmail.com Phone Number: 9800000000 Gender: Male Password: NFG!@#$1234 Re-type Password: NFG!@#$	Passwords must match.	Passwords must match.	Pass

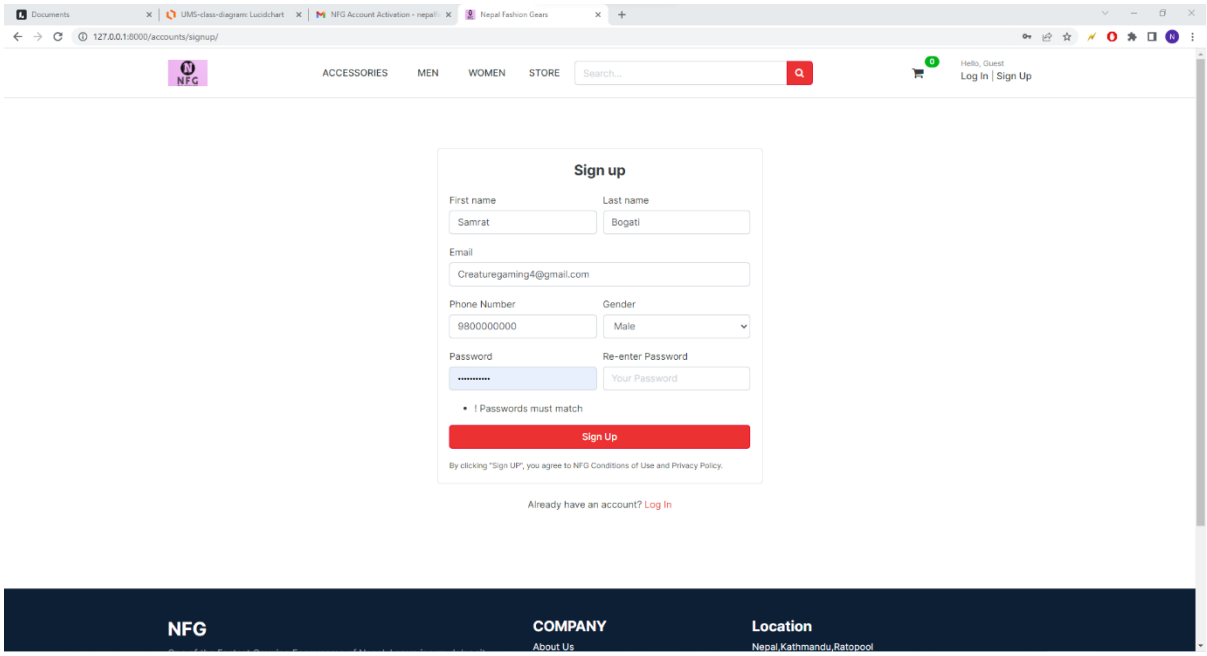


Figure 51: Passwords must match.

2	Fail to enter the last name.	First name: Samrat Email: Creaturegaming4@gmail.com Phone Number: 9800000000 Gender: Male Password: NFG!@#$1234 Re-type Password: NFG!@#$ 1234	Please fill out the last name.	Please fill out the last name.	Pass

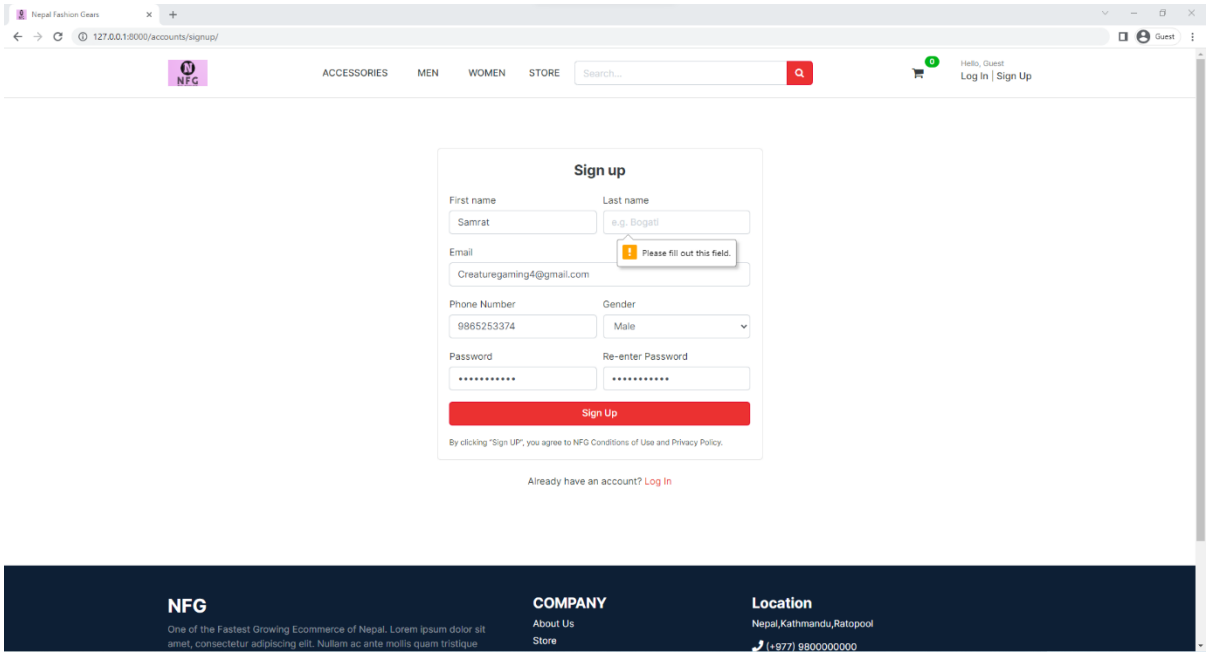


Figure 52: Please fill out the last name.

3	Enter the incorrect email.	First name: Samrat Last name: Bogati Email: Creaturegaming Phone Number: 9800000000 Gender: Male Password: NFG!@#$1234 Re-type Password: NFG!@#$ 1234	Please include @ in the email address.	Please include @ in the email address.	Pass

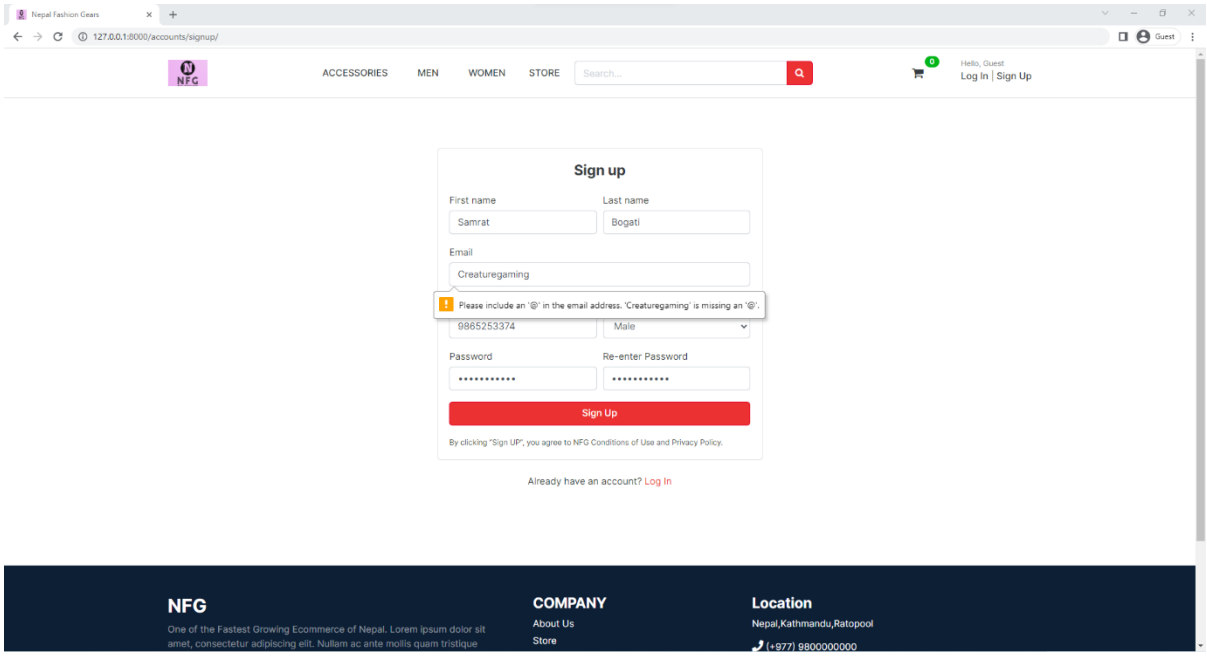


Figure 53: Please include @ in the email address.

4	Enter valid information.	First name: Samrat Last name: Bogati Email: Creaturegaming4@gmail.com Phone Number: 9800000000 Gender: Male Password: NFG!@#$1234 Re-type Password: NFG!@#$ 1234	Send verification email link in user email.	Send verification email link in user email.	Pass

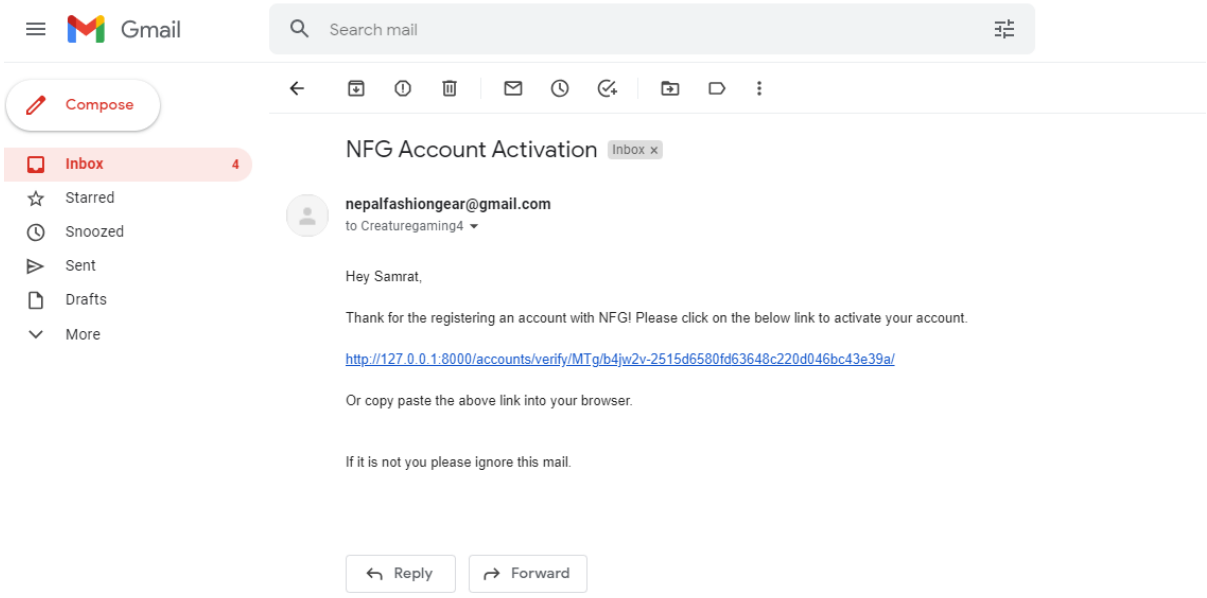


Figure 54: Send verification email link in user email.

5	Enter valid user information in login page.	Email: Creaturegaming4@gmail.com Password: NFG!@#$1234	Load page to home page with account and logout option in navigation bar.	Load page to home page with account and logout option in navigation bar.	Pass

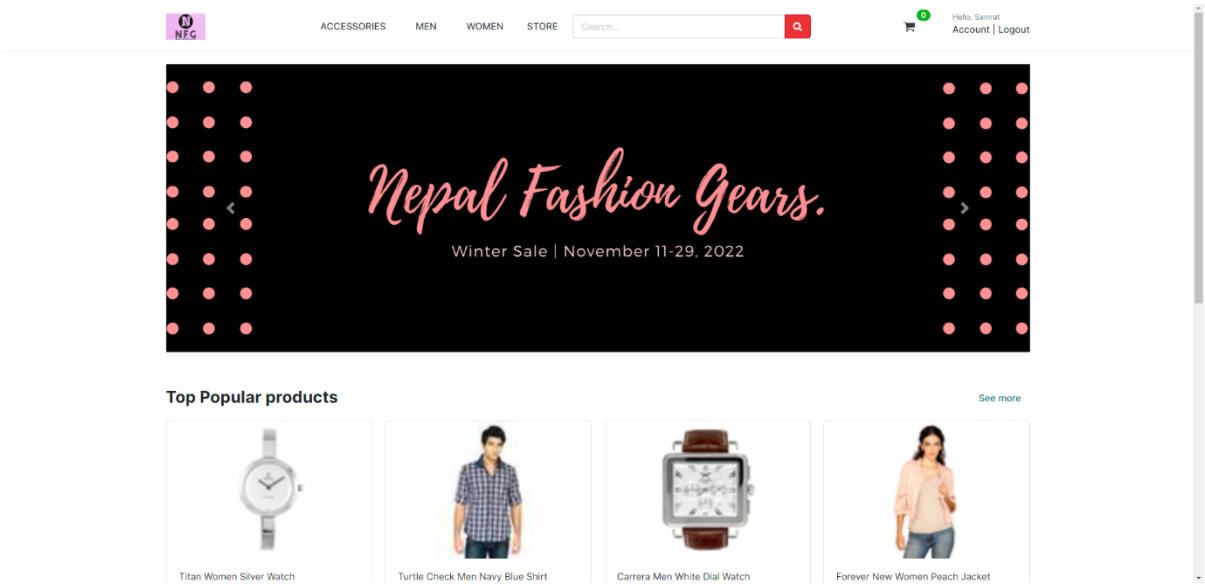


Figure 55: Home page with account and logout option in navigation bar.

6	Try to crate the account with use email address.	First name: Hari Last name: Sharma Email: Creaturegaming4@gmail.com Phone Number: 9700000000 Gender: Male Password: NFG!@#$1234 Re-type Password: NFG!@#$ 1234	Account with email already exist.	Account with email already exist.	Pass

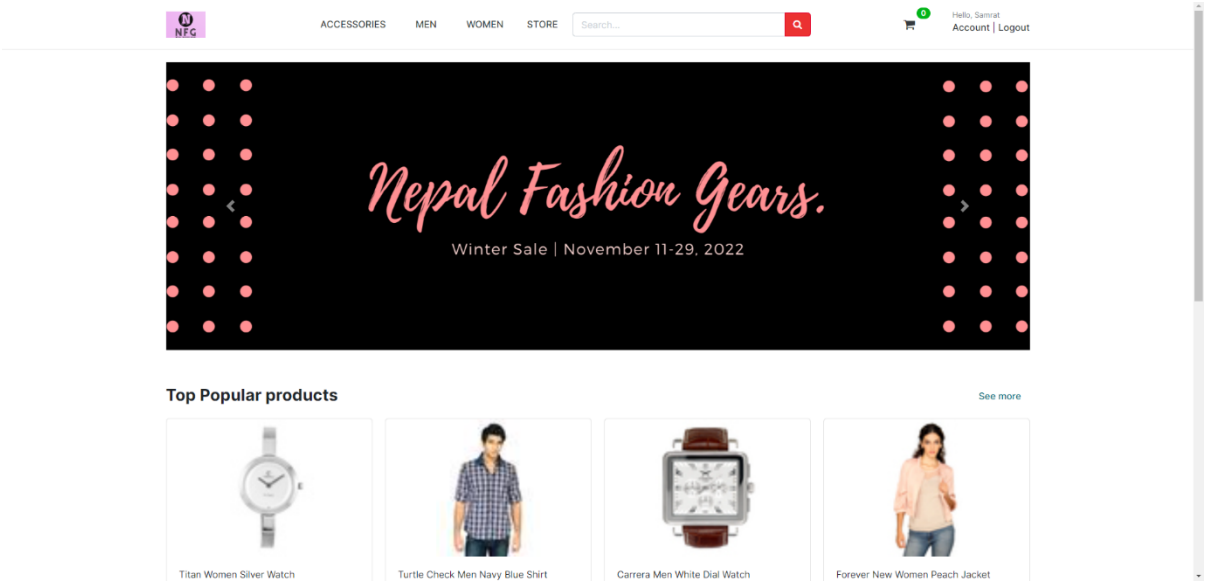


Figure 56: Account with email already exist.

7	Change the password through the change password page.	Current Password: NFG!@#$1234 Current Password: Hello1234 Re-type Password: Hello9090	New password and retype password does not match.	New password and retype password does not match.	Pass

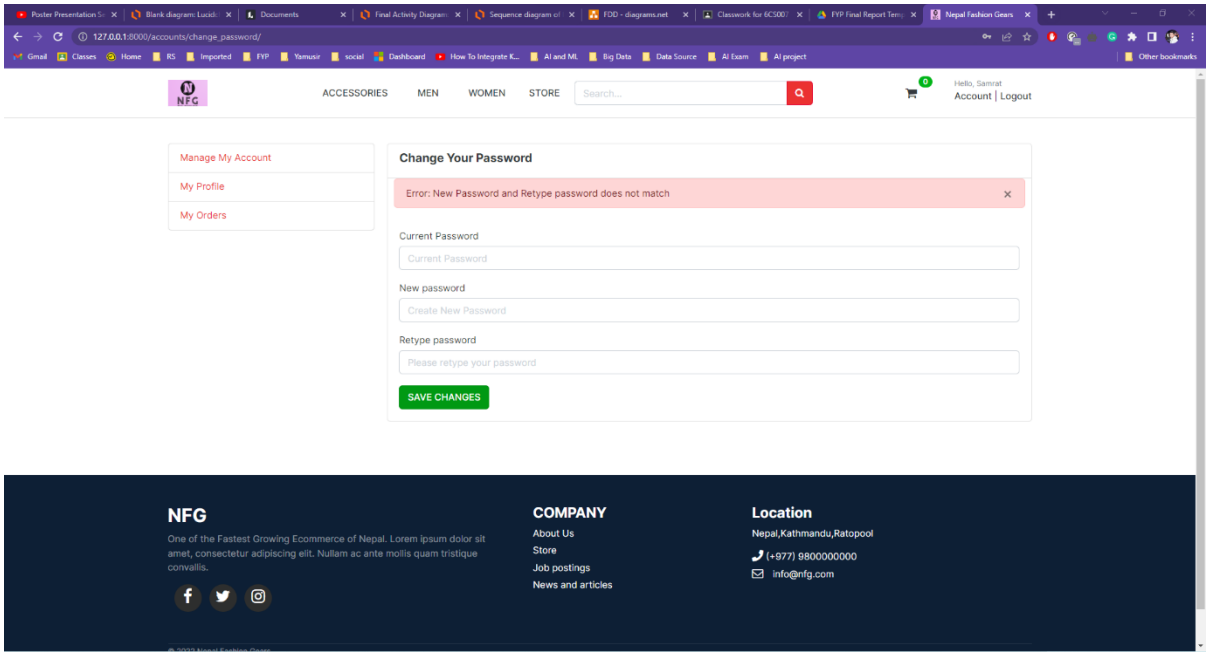


Figure 57: New password and retype password does not match.

8	Enter the valid Password.	Current Password: NFG!@#$1234 Current Password: Hello1234 Re-type Password: Hello1234	Password change successfully and redirect to login page.	Password change successfully and redirect to login page.	Pass

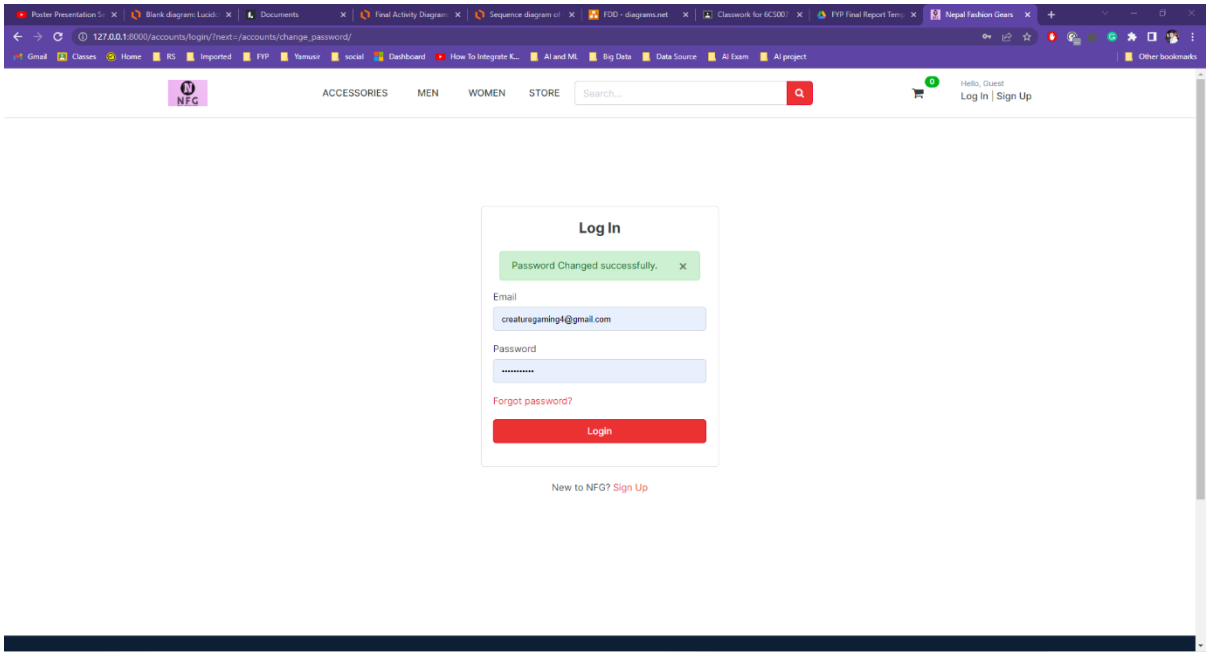


Figure 58: Password change successfully and redirect to login page.

9	Enter the valid user email in forget password page.	Email: Creaturegaming4@gmail.com	Password reset email is send to your email address.	Password reset email is send to your email address.	Pass

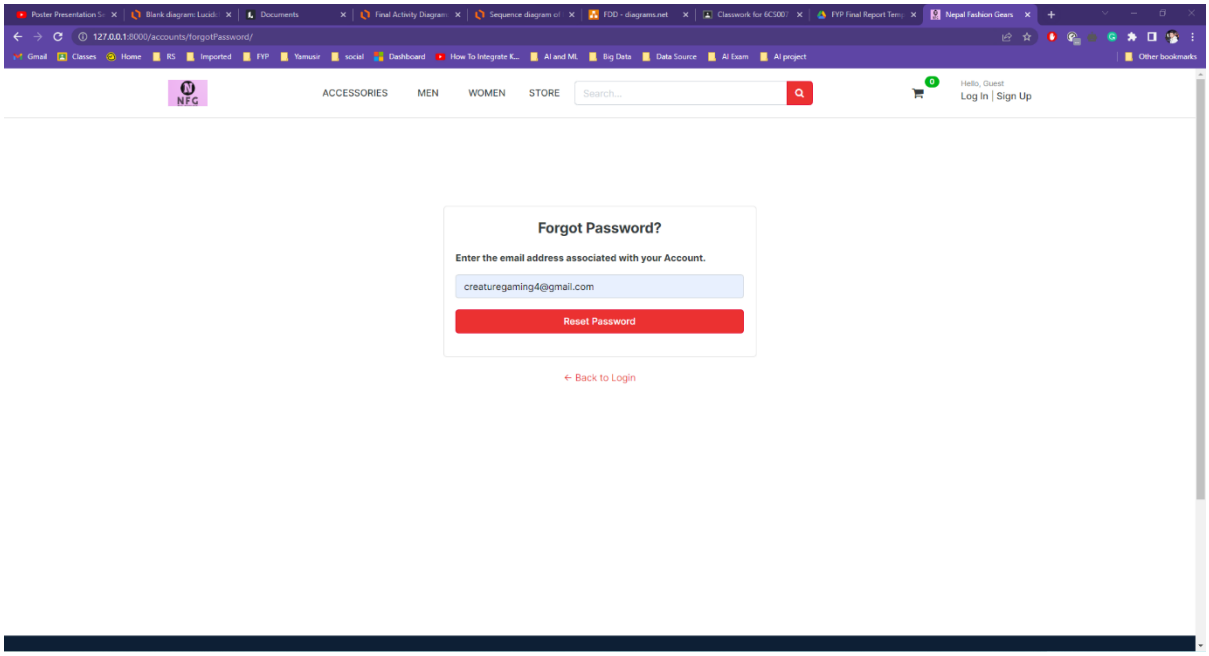


Figure 59: Forget password page

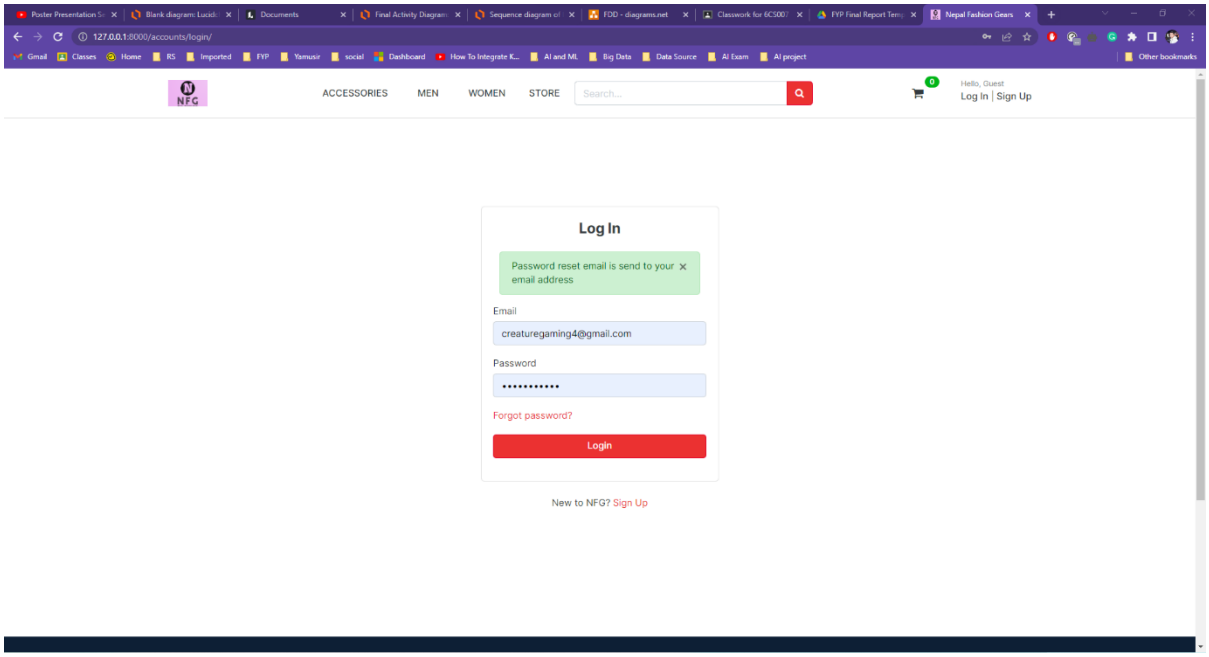


Figure 60: Password reset email is send to your email address.

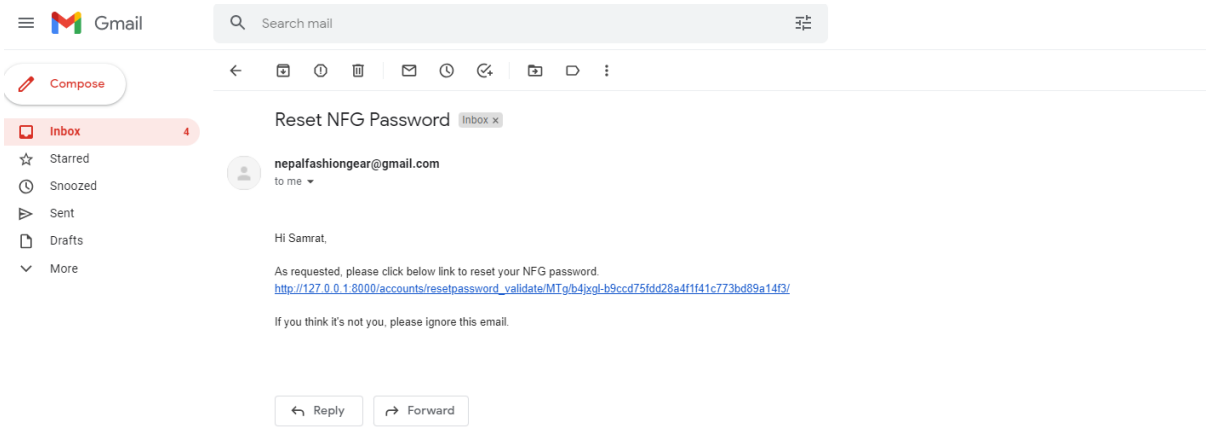


Figure 61: Password reset link

10	Type valid password in rest password page.	Create Password: NFG!@#$1234 Confirm Password: NFG!@#$ 1234	Password reset successfully and load login page.	Password reset successfully and load login page.	Pass

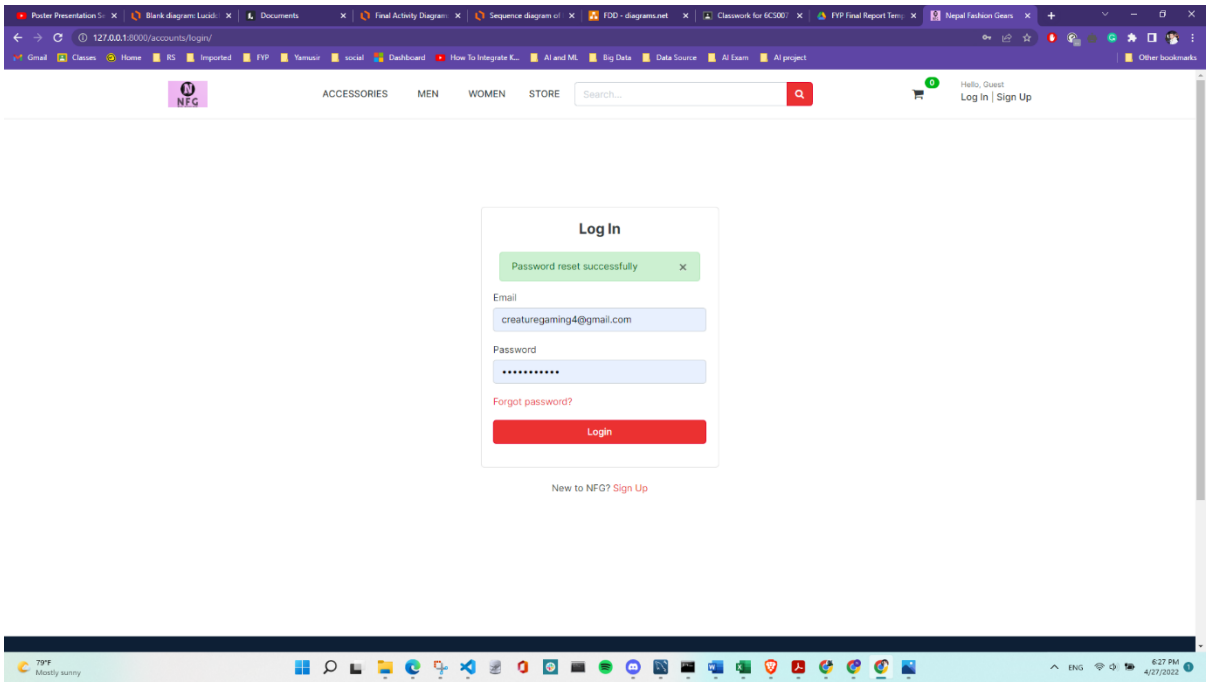


Figure 62: Password reset successfully and redirect to login page.

11	Click add to cart button in product details page.	Select color: Red Select Size: Large	Add product in cart page.	Add product in cart page.	Pass

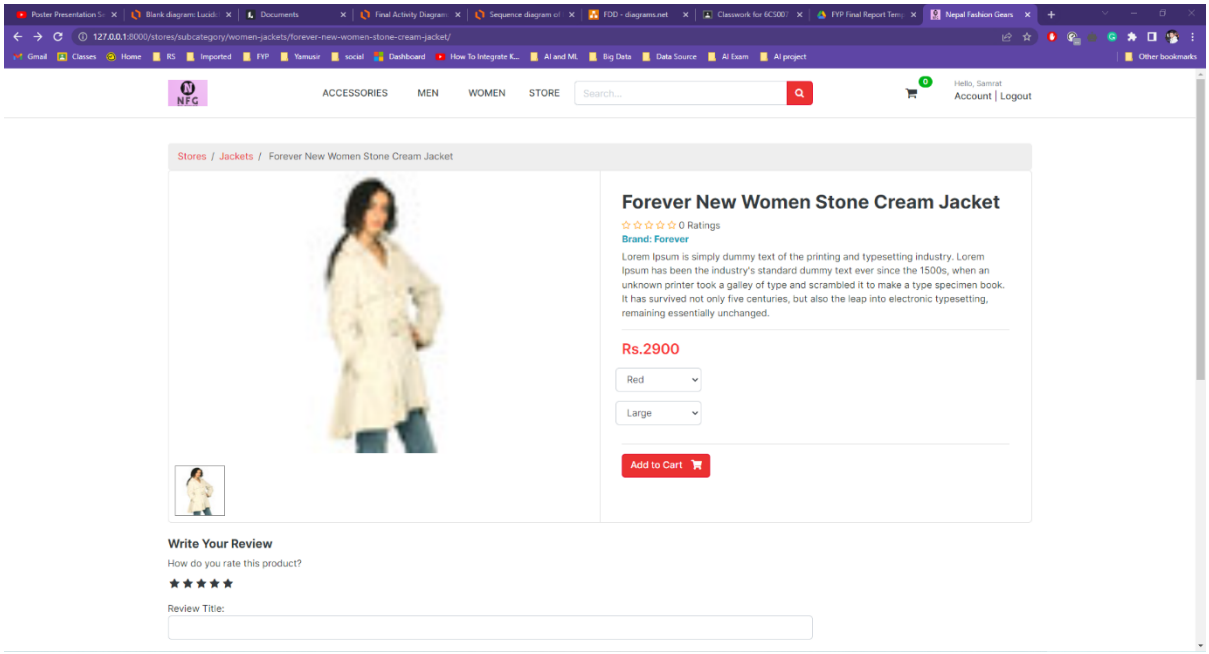


Figure 63Click add to cart button

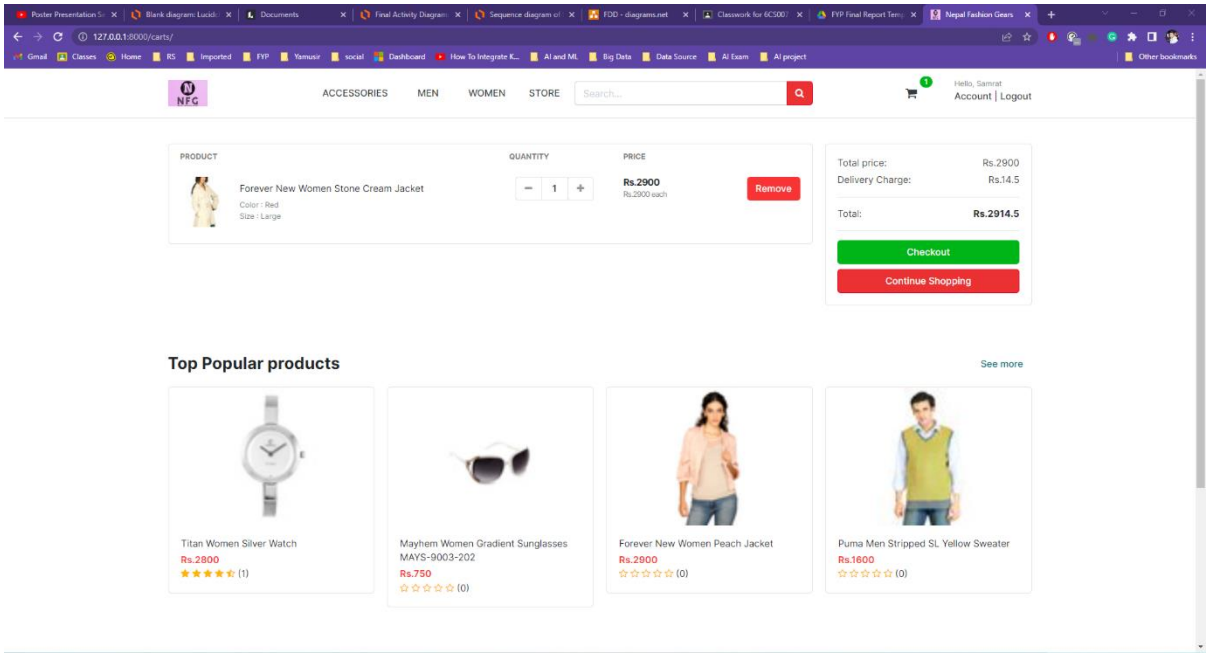


Figure 64: Add product in cart page

12	Click on checkout button.	Click on checkout button.	load checkout page.	load checkout page.	Pass

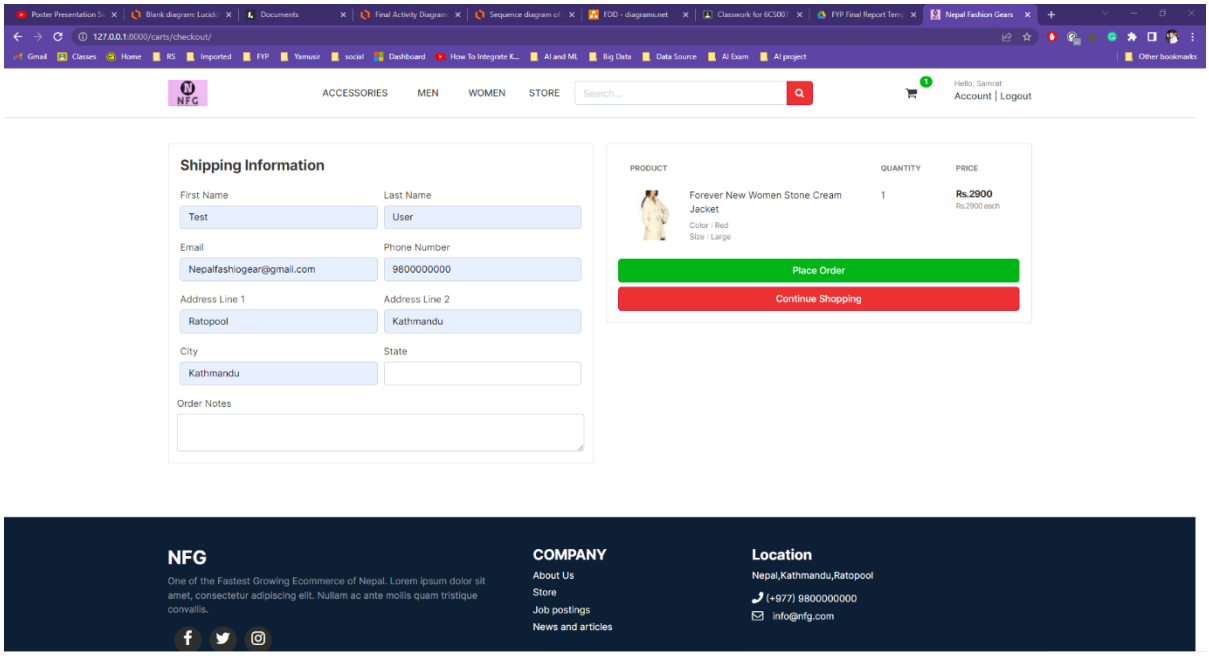


Figure 65: Checkout page.

13	Click on place order button.	Click on place order button.	Load place order page.	Load place order page.	Pass

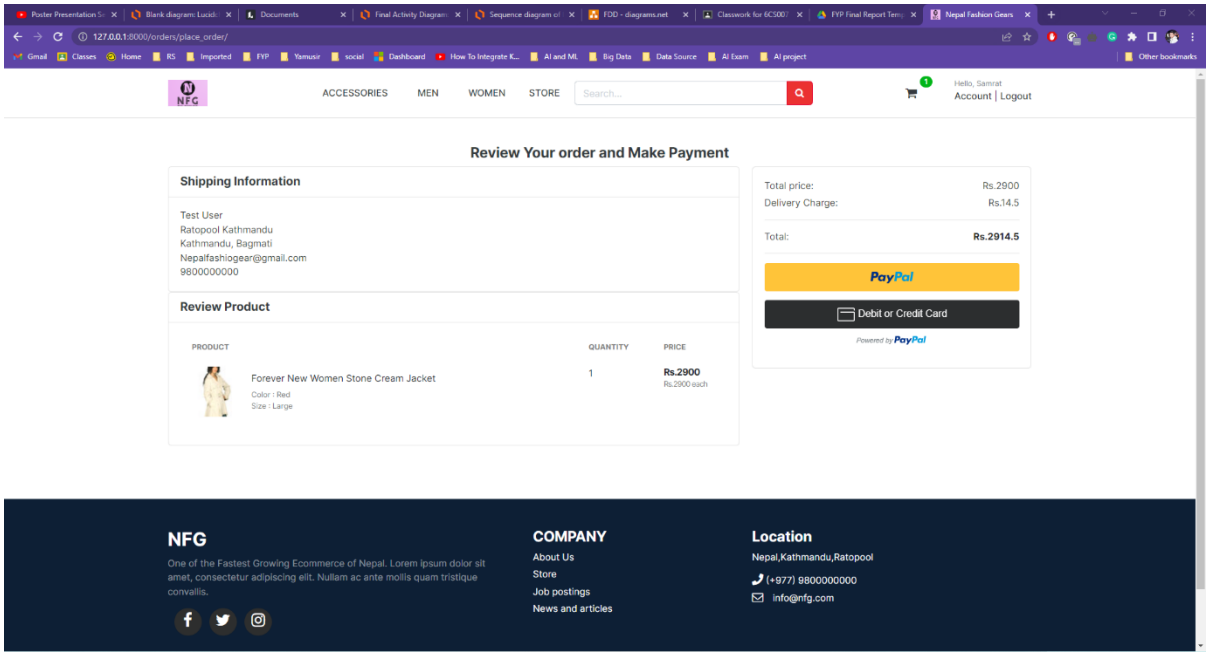


Figure 66: Place order page

14	Click on PayPal button.	Click on PayPal button.	Pop ups PayPal payment page.	Pop ups PayPal payment page.	Pass
15	Enter valid PayPal email and password.	Email Password	Payment success and show the invoice of product.	Payment success and show the invoice of product.	Pass

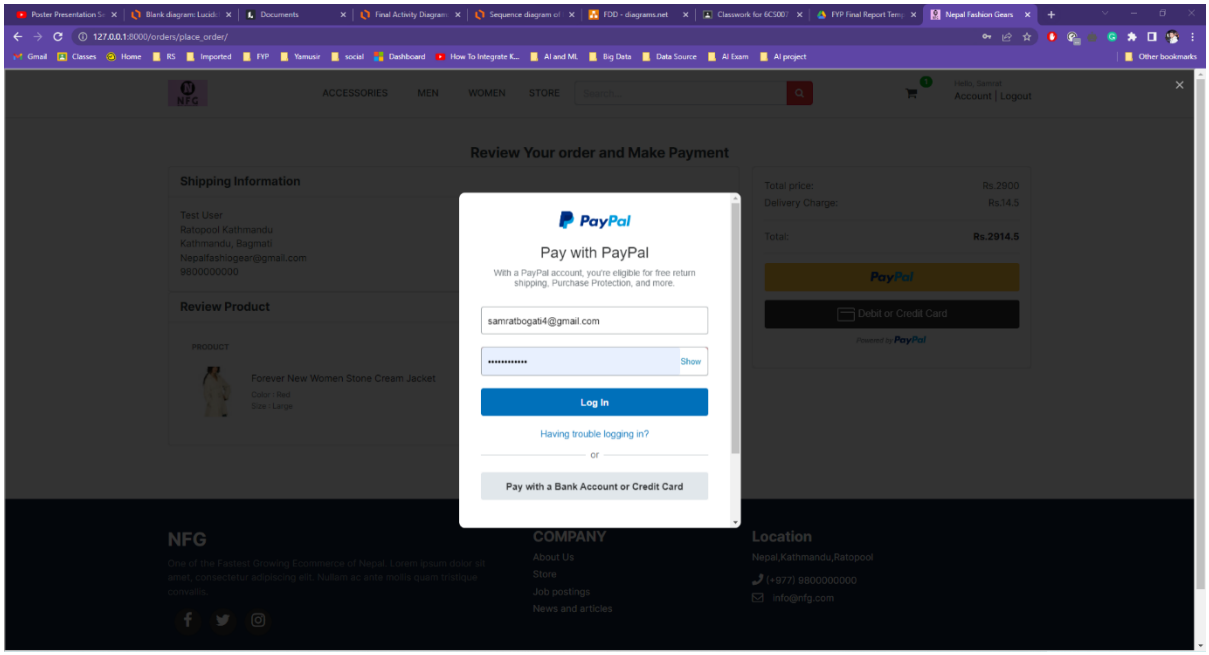


Figure 67: Pop ups PayPal payment page.

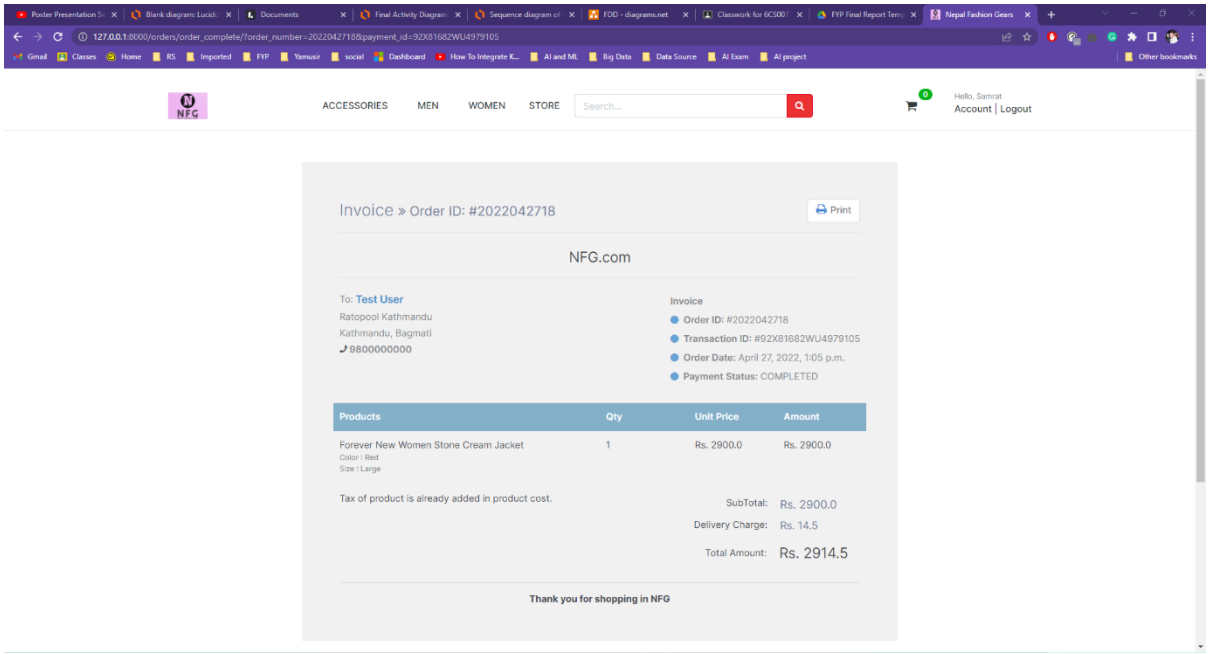


Figure 68: Payment success and show the invoice of product

7. Conclusion

The main aim of my system were:

- To create the AI engine that recommends products based on item similarity.
- Develop a user-friendly and accessible web application for clothing stores.

- To notify the user when they buy the products

Here, in this system users can create and log in at any time. User must verify their email address while creating an account. There use features like forget the password, where they must type their email address and the system, will send forget password link in their email address. Here, we use the Django session key to store the cart information so if the user adds the products in the cart before login system will show their cart information after login also. Moreover, once the user buys the product through the system, they have the option to review and rate the product based on their experience with the product. Where another user can see their review and rating of the products. They also get notified in their email address with the order number once they had buy the product successfully. In the recommendation part, we have implemented the item-based collaborative filtering and recommended the product on the product details page. On the product details page, the system passes the product name in the recommendation function. It will use cosine similarity to calculate the similarity between the product based on the rating and use a "brute" algorithm to calculate the nearest neighbors of the products. So, in this way our user gets the recommended product and overall system work.

7.1. Future Work:

Since this project is done overtime a period of two-semester, we do not have enough time to implement all the features that are provided by the present eCommerce system. The system fulfils all the basic requirements like creating an account, logging in, adding to a cart, making payments online, placing orders, etcetera to make the eCommerce system. However, the system lacks some features like cash on delivery, signing with social accounts, a direct buy option, saving multiple add of the user, and order tracking. Similarly, for admin, we can show the different graphs to monitor the sales of products and email marketing where users get newly added or top-rated products got informed in their email. Moreover, having a single recommendation that is item-based collaborative filtering gets some kind of problem like a cold start. Where due to the lack of rating in the product there will be no kind of recommendation for that product. To overcome this problem, we can use a multiple recommendation system or try the hybrid-based recommendation. At last, all of the above points can be done as the future work for this system.

8. Critical Evaluations of the project

Nepal Fashion Gear is a web based ecommerce application for wearable products that aims to provide personalized clothes to everyone throughout the country. Its goal is to provide an online platform where registered users may browse for items and add them to their shopping carts to complete the purchase process. Users may search for items and get relevant results without logging in.. Similarly, we can filter the searched result based on price and brand of products. Once users have bought the products and rate the products in Nepal Fashion Gear. Since, this is the inventory-based ecommerce system, having the only one admin to manage wearable product. Comparing with the other ecommerce of market it will focus on the particular category of the product that is fashion related item. It is going to easy for admin to manage the product and user can find the all the product of this category.

People nowadays are more concerned with their appearances, particularly when it comes to clothing, dressing differently depending on who they will be meeting and avoiding wearing the same outfit the next day. Based on user rating AI model will be recommended similar products which have been highly rated to the respective users. We created item-based collaborative filtering for this system and recommended the product on the product details page. The system uses the product name in the suggestion function on the product information page. It will utilize a "brute" technique to find the nearest neighbors of the items and will use cosine similarity to assess the similarity between the products depending on the rating. So, in this way our user gets the recommended product and overall system work.

Evidence of Project Management

8.1. Log sheet

Faculty of Science and Engineering
School of Mathematics and Computer Science

UNIVERSITY OF WOLVERHAMPTON

1

PROJECT MANAGEMENT LOG

First Name:	Samrat	Surname :	Bagati
Student Number:	2050208	Supervisor:	Mr. Aarush Thapa
Project Title:	Nepal Fashion Week (NFW)	Month:	October

What have you done since the last meeting

What do you aim to complete before the next meeting

1. Research on topic and web application.

Supervisor comments

1. Research on topic
2. Research on technology.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 10/10/2021

Supervisor Signature: _____ Date: 10/10/2021

Faculty of Science and Engineering
School of Mathematics and Computer Science

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2

PROJECT MANAGEMENT LOG

First Name: Samrat	Surname : Bagati
Student Number: 2050208	Supervisor: Mr. Aarush Thapa
Project Title: Nepal Fashion Gear (NFG)	Month: October

What have you done since the last meeting

1. Research on topic
2. Research on web application.

What do you aim to complete before the next meeting

1. Start proposal writing
2. Research on ecommerce system.

Supervisor comments

1. Selected topic is finilized.
2. Start writing proposal.
3. Research on ecommerce system.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 10/24/2021

Supervisor Signature: _____ Date: 10/24/2021

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3

PROJECT MANAGEMENT LOG

First Name: Samrat	**Surname :** Bogati
Student Number: 2050208	**Supervisor:** Mr. Aarush Thapa
Project Title: Nepal Fashion Gear (NFG)	**Month:** October

What have you done since the last meeting

1. Proposal writing has been started.
2. Research on ecommerce system.

What do you aim to complete before the next meeting

1. Show draft of the proposal to supervisor.
2. Research on system design
3. Research on Django Framework.
4. Finilized project Gantt chart

Supervisor comments

1. Done as Mentioned above.
2. Prepare Gantt chart,
3. Research on system design.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 10/31/2021

Supervisor Signature: _____ Date: 10/31/2021

Faculty of Science and Engineering
School of Mathematics and Computer Science

UNIVERSITY OF WOLVERHAMPTON

4

PROJECT MANAGEMENT LOG

First Name: Samrat	Surname : Bogati
Student Number: 2050208	Supervisor: Mr. Aayush Thapa
Project Title: Nepal Fashion Gear (NFG)	Month: November

What have you done since the last meeting

1. Research on system design
2. Project Gantt chart has been done.
3. Research on Django Framework.

What do you aim to complete before the next meeting

1. Submit Proposal draft.
2. Design wireframe of system.

Supervisor comments

1. Add research on a similar system in the proposal atleast 5.
2. Complete literature review of proposal.
3. List out features and prepare wireframe.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 11/14/2021

Supervisor Signature: _____ Date: 11/14/2021

Faculty of Science and Engineering
School of Mathematics and Computer Science

UNIVERSITY OF WOLVERHAMPTON

5

PROJECT MANAGEMENT LOG

First Name: Samrat	Surname : Bogati
Student Number: 2050208	Supervisor: Mr. Aarush Thapa
Project Title: Nepal Fashion Gear (NFG)	Month: November

What have you done since the last meeting

1. Submit Proposal draft
2. Design wireframe of overal system.

What do you aim to complete before the next meeting

1. Project setup for system and push code in github.

Supervisor comments

1. Proposal has been accepted.
2. Start the project development
3. Use project management tools.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 11/22/2021

Supervisor Signature: _____ Date: 11/22/2021

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School of Mathematics and Computer Science

UNIVERSITY OF WOLVERHAMPTON

6

PROJECT MANAGEMENT LOG	
First Name: Samrat	Surname : Bogati
Student Number: 2050208	Supervisor: Mr. Aarush Thapa
Project Title: Nepal Fashion Gear (NFG)	Month: December

What have you done since the last meeting

1. Project setup has been done.

What do you aim to complete before the next meeting

1. Start literature review and submit a draft.
2. Research on different types of ecommerce and how does work!

Supervisor comments

1. Done as mentioned above.
2. Start literature review.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 12/05/2021

Supervisor Signature: _____ Date: 12/05/2021

Faculty of Science and Engineering
School of Mathematics and Computer Science

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7

PROJECT MANAGEMENT LOG	
First Name: Samrat	Surname : Bogati
Student Number: 2050208	Supervisor: Mr. Aarush Thapa
Project Title: Nepal Fashion Gear (NFG)	Month: December

What have you done since the last meeting

1. Submit literature review draft.
2. Research on different types of recommendation system.

What do you aim to complete before the next meeting

1. Complete literature review.
2. Research on recommendation system.

Supervisor comments

1. Explain different types of recommendation system in detail.
2. Complete research on five similar system.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 12/12/2021

Supervisor Signature: _____ Date: 12/12/2021

Faculty of Science and Engineering
School of Mathematics and Computer Science

UNIVERSITY OF WOLVERHAMPTON

8

PROJECT MANAGEMENT LOG

First Name: Samrat	Surname : Bagati
Student Number: 2050208	Supervisor: Mr. Aarush Thapa
Project Title: Nepal Fashion Gear (NFG)	Month: December

What have you done since the last meeting

1. literature review has been done.
2. Research on recommendation system.

What do you aim to complete before the next meeting

1. List the different feature of system.
2. Start Artifact design.
3. Create the FDD of system and SRS of the sub-system.
4. Home page development.

Supervisor comments

1. Done as Mentioned above.
2. Create Artifact design.
3. Complete home page.
4. List out feature and deadline

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 12/26/2021

Supervisor Signature: _____ Date: 12/26/2021

Faculty of Science and Engineering
School of Mathematics and Computer Science

UNIVERSITY OF WOLVERHAMPTON

3

PROJECT MANAGEMENT LOG

First Name: Samrat Surname : Bogati

Student Number: 2050208 Supervisor: Mr. Aarush Thapa

Project Title: Nepal Fashion Week (NFW) Month: January

What have you done since the last meeting

1. Features of system has been listed.
2. Home page development.
3. FDD and SRS of system has been created.

What do you aim to complete before the next meeting

1. Draw ERD and class diagram of user management system.
2. User Authentication. ~~part complete~~.
3. Complete Artifact design.

Supervisor comments

1. Add all subsystem functionality in FDD.
2. ERD, Class diagram and Artifact design.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 1/23/2022

Supervisor Signature: _____ Date: 1/23/2022

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School of Mathematics and Computer Science

UNIVERSITY OF WOLVERHAMPTON

10

PROJECT MANAGEMENT LOG

First Name: Samrat Surname: Bogati

Student Number: 2050208 Supervisor: Mr Aarush Thapa

Project Title: Nepal Fashion Gear (NFG) Month: February

What have you done since the last meeting

1. Complete Artifact design.
2. ERD and class diagram has been drawn.
3. Complete User Authentication.

What do you aim to complete before the next meeting

1. Build the model for product Management System (PMS).
2. Draw ERD and class diagram of PMS.
3. Fix issues with the banner on the homepage.
4. Start Professionalism Report.

Supervisor comments

1. Add email verification and forget password option.
2. Complement implementation of product management system.
3. Complete ERD and class diagram.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 2/18/2022

Supervisor Signature: _____ Date: 2/18/2022

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Faculty of Science and Engineering
School of Mathematics and Computer Science

11

PROJECT MANAGEMENT LOG

First Name: Samrat Surname : Bogati

Student Number: 2050208 Supervisor: Mr. Aarush Thapa

Project Title: Nepal Fashion Week (NFW) Month: ~~February~~ March

What have you done since the last meeting

1. Build the model for product management system (PMS).
2. Draw ERD and class diagram of PMS.
3. Added email verification and forget password option.

What do you aim to complete before the next meeting

1. Build product variation model.
2. Create product detail page.

Supervisor comments

1. Done as mentioned above.
2. Implement product detail page.
3. Complete ecommerce workflow.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 3/13/2022

Supervisor Signature: _____ Date: 3/13/2022

Faculty of Science and Engineering
School of Mathematics and Computer Science

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17

PROJECT MANAGEMENT LOG

First Name: Samrat Surname : Bogati

Student Number: 2050208 Supervisor: Mr. Aarush Thapa

Project Title: Nepal Fashion Wear (NFW) Month: March

What have you done since the last meeting

1. Create product details page.
2. Build product variation model.

What do you aim to complete before the next meeting

1. ~~Start professionalism Report.~~ Add pagination and search functionality.
2. Create cart page.

Supervisor comments

1. Done as mentioned above.
2. User should able to checkout with the product.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 3/20/2022

Supervisor Signature: _____ Date: 3/20/2022

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School of Mathematics and Computer Science

UNIVERSITY OF WOLVERHAMPTON

13

PROJECT MANAGEMENT LOG

First Name: Samrat Surname : Bogati

Student Number: 2050208 Supervisor: Mr. Aarush Thapa

Project Title: Nepal Fashion Gears (NFG) Month: March

What have you done since the last meeting

1. Create a cart page.
2. Added pagination and search functionality.

What do you aim to complete before the next meeting

1. Build the model for order management and payment.
2. Create the user dashboard
3. Research on collaborative based recommendation system.

Supervisor comments

1. Done as mentioned above.
2. Seperate admin and user.
3. Complete remaining order management.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 3/27/2022

Supervisor Signature: _____ Date: 3/27/2022

Faculty of Science and Engineering
School of Mathematics and Computer Science

UNIVERSITY OF WOLVERHAMPTON

14

PROJECT MANAGEMENT LOG	
First Name: Samrat	Surname : Bogati
Student Number: 2050208	Supervisor: Mr. Aarush Thapa
Project Title: Nepal Fashion Gear (NFG)	Month: April

What have you done since the last meeting

1. Create user dashboard
2. Research on collaborative based recommendation system.
3. Build the model for order management.

What do you aim to complete before the next meeting

1. Create edit profile feature for user.
2. Collect the data for ~~sub~~system.
3. Build the recommendation model.

Supervisor comments

1. Done as mentioned above.
2. Complete user related feature.
3. Train recommendation model.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 4/19/2022

Supervisor Signature: _____ Date: 4/19/2022

Faculty of Science and Engineering
School of Mathematics and Computer Science

UNIVERSITY OF WOLVERHAMPTON

15

PROJECT MANAGEMENT LOG

First Name: Samrat	Surname : Bogati
Student Number: 2050208	Supervisor: Aarush Thapa
Project Title: Nepal Fashion Gear (NFG)	Month: April

What have you done since the last meeting

1. Create edit profile feature for user.
2. Build the recommendation model.
3. Collect data for system.

What do you aim to complete before the next meeting

1. Integrate the recommendation model in system.

Supervisor comments

1. Done as mentioned above.
2. Integrate recommendation system.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 4/21/2022

Supervisor Signature: _____ Date: 4/22/2022

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UNIVERSITY OF WOLVERHAMPTON

16

PROJECT MANAGEMENT LOG	
First Name: Samrat	Surname : Bogati
Student Number: 2050208	Supervisor: Aarush Thapa
Project Title: Nepal Fashion Gear (NFG)	Month: April

What have you done since the last meeting

1. Recommendation model is integrated in system.

What do you aim to complete before the next meeting

Supervisor comments

1. Overall work is ok to submit.
2. Prepare for viva.
3. Make your report good.

We confirm that the information given in this form is true, complete and accurate.

Student Signature: _____ Date: 4/25/2022

Supervisor Signature: _____ Date: 4/25/2022

8.2. Gantt chart

	Name	Duration	Start	Finish
1	**Initiation**	6 days	**11/17/21 8:00 AM**	**11/24/21 5:00 PM**
2	Reasearch in similar project and algorithm	3 days	11/17/21 8:00 AM	11/19/21 5:00 PM
3	Requirement Gathering	3 days	11/20/21 8:00 AM	11/24/21 5:00 PM
4	**Planning**	12 days	**11/25/21 8:00 AM**	**12/10/21 5:00 PM**
5	Create Shedule and Task aplan	2 days	11/25/21 8:00 AM	11/26/21 5:00 PM
6	Risk Factor management	3 days	11/27/21 8:00 AM	12/1/21 5:00 PM
7	Time Analysis	3 days	12/3/21 8:00 AM	12/7/21 5:00 PM
8	Project Flowchart	3 days	12/8/21 8:00 AM	12/10/21 5:00 PM
9	**User Management System**	42 days	**12/13/21 8:00 AM**	**2/8/22 5:00 PM**
10	Creating Wireframe	3 days	12/13/21 8:00 AM	12/15/21 5:00 PM
11	UI design	4 days	12/16/21 8:00 AM	12/21/21 5:00 PM
12	Frontend Development	8 days	12/22/21 8:00 AM	12/31/21 5:00 PM
13	Backend Development	10 days	1/1/22 8:00 AM	1/14/22 5:00 PM
14	Creating database for User	8 days	1/15/22 8:00 AM	1/26/22 5:00 PM
15	Testing	5 days	1/27/22 8:00 AM	2/2/22 5:00 PM
16	Deployment	4 days	2/3/22 8:00 AM	2/8/22 5:00 PM
17	**Product Management System**	33 days	**2/9/22 8:00 AM**	**3/25/22 5:00 PM**
18	Choosing the Algorithm	4 days	2/9/22 8:00 AM	2/14/22 5:00 PM
19	Collecting the required data for the Sytem	4 days	2/15/22 8:00 AM	2/18/22 5:00 PM
20	Train the model	10 days	2/19/22 8:00 AM	3/4/22 5:00 PM
21	Integrating the model in system	10 days	3/5/22 8:00 AM	3/18/22 5:00 PM
22	Testing	5 days	3/19/22 8:00 AM	3/25/22 5:00 PM
23	Deployment	4 days	3/19/22 8:00 AM	3/24/22 5:00 PM
24	**Order Management System**	18 days	**3/25/22 8:00 AM**	**4/19/22 5:00 PM**
25	Creating the Wireframe and Design	2 days	3/25/22 8:00 AM	3/28/22 5:00 PM
26	Frontend Development	3 days	3/29/22 8:00 AM	3/31/22 5:00 PM
27	Choosing the payment method	2 days	4/1/22 8:00 AM	4/4/22 5:00 PM
28	Integrating the payment gateway	5 days	4/5/22 8:00 AM	4/11/22 5:00 PM
29	Testing	3 days	4/12/22 8:00 AM	4/14/22 5:00 PM
30	Deployment	3 days	4/15/22 8:00 AM	4/19/22 5:00 PM

Figure 69: Gant chart 1

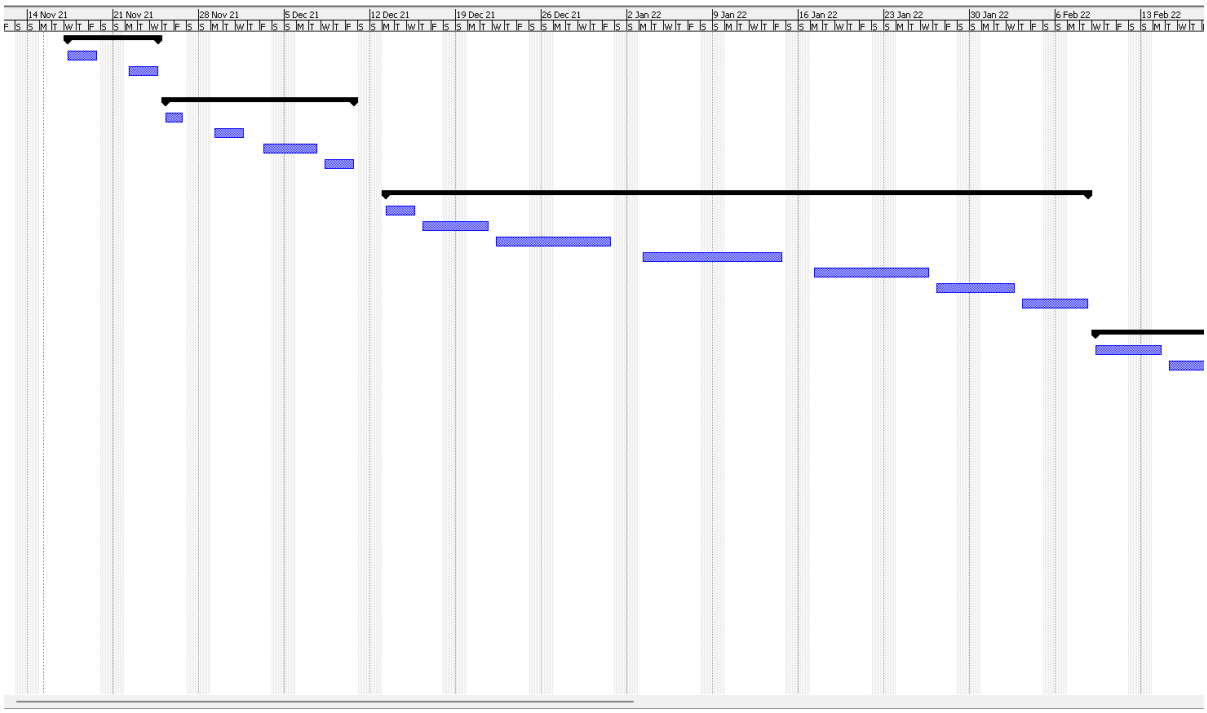

Figure 70 Gant chart 2

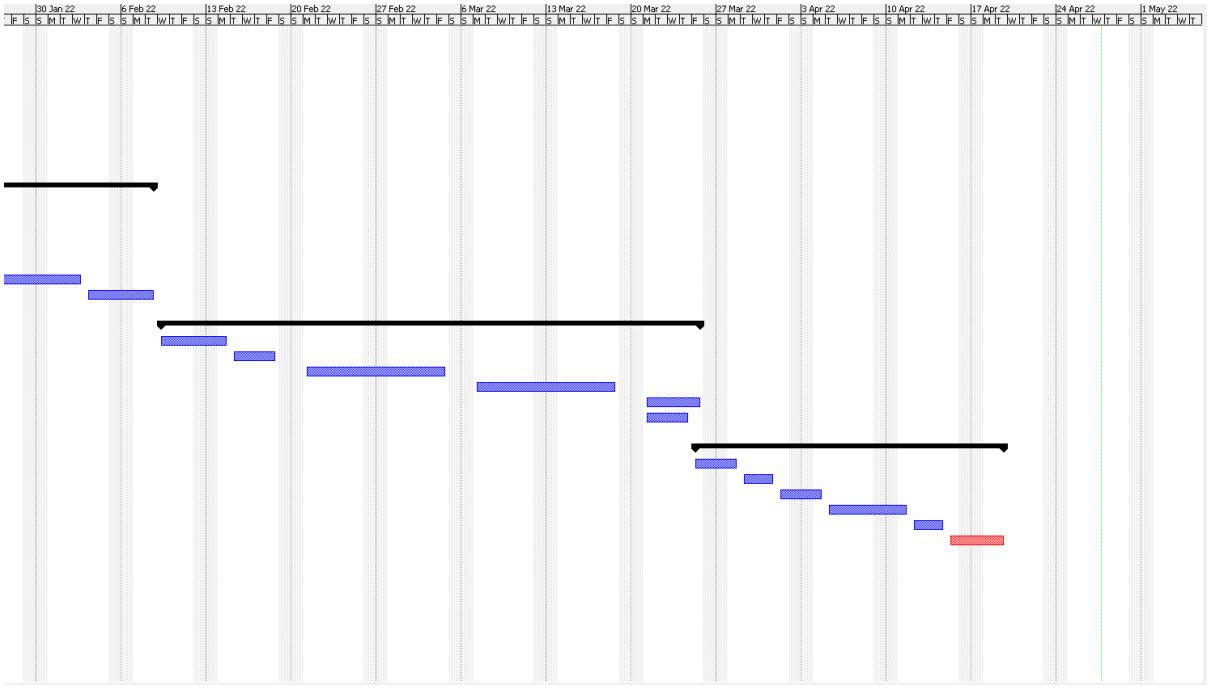

Figure 71 Gant chart 3

8.3. GitHub Commits

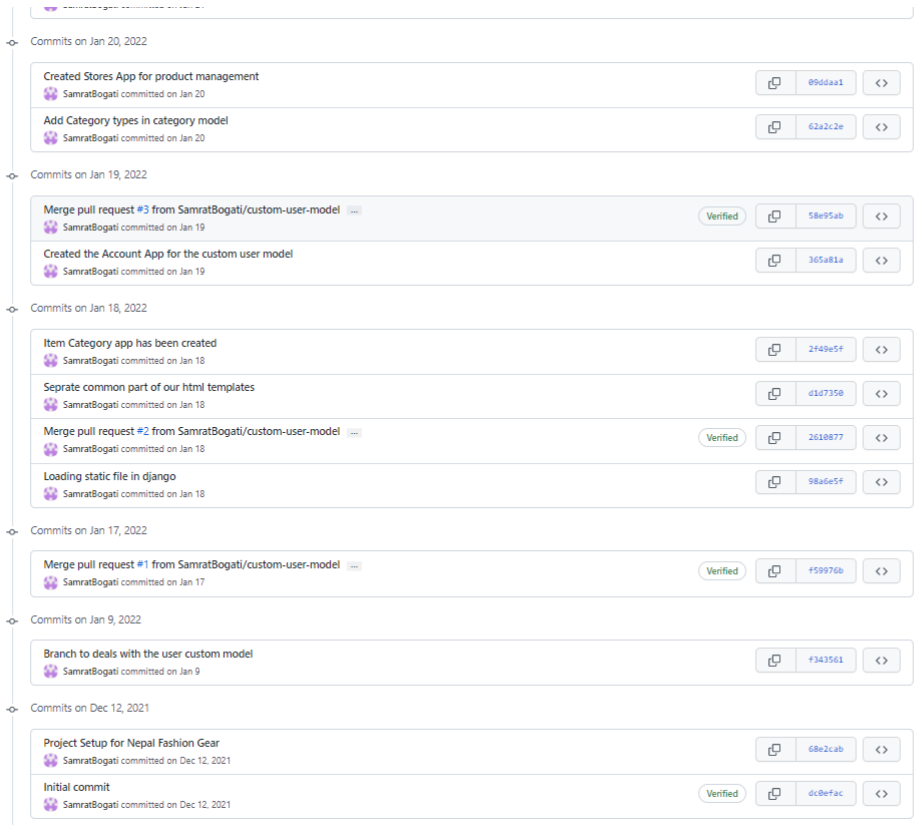

Figure 72: Git commit 1

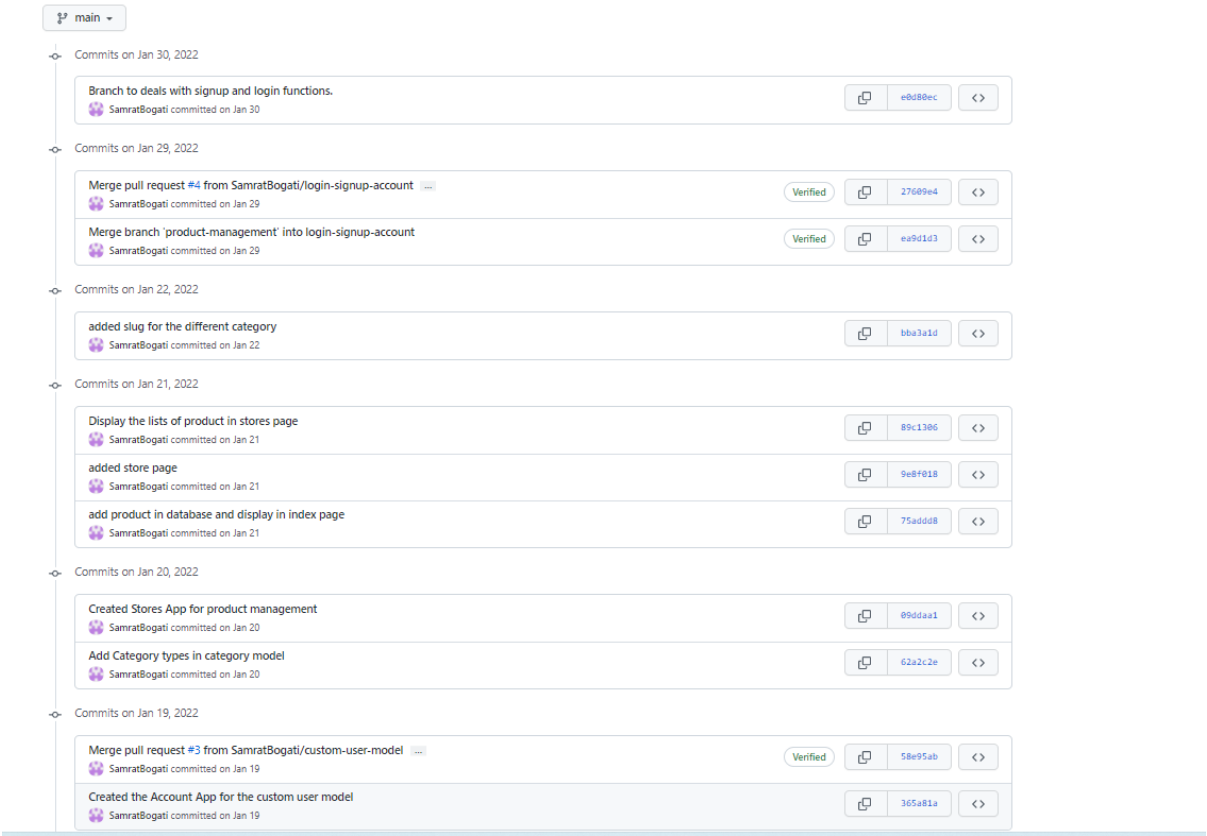

Figure 73: Git commit 2

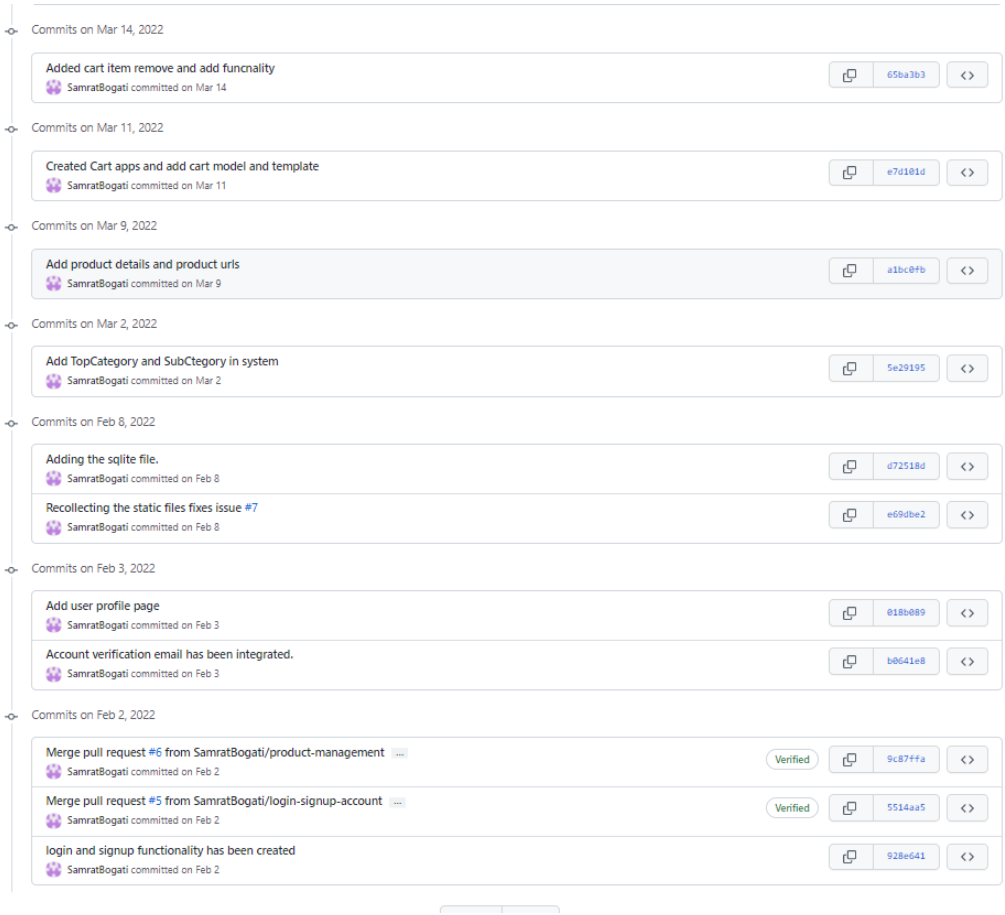

Figure 74: Git commit 3

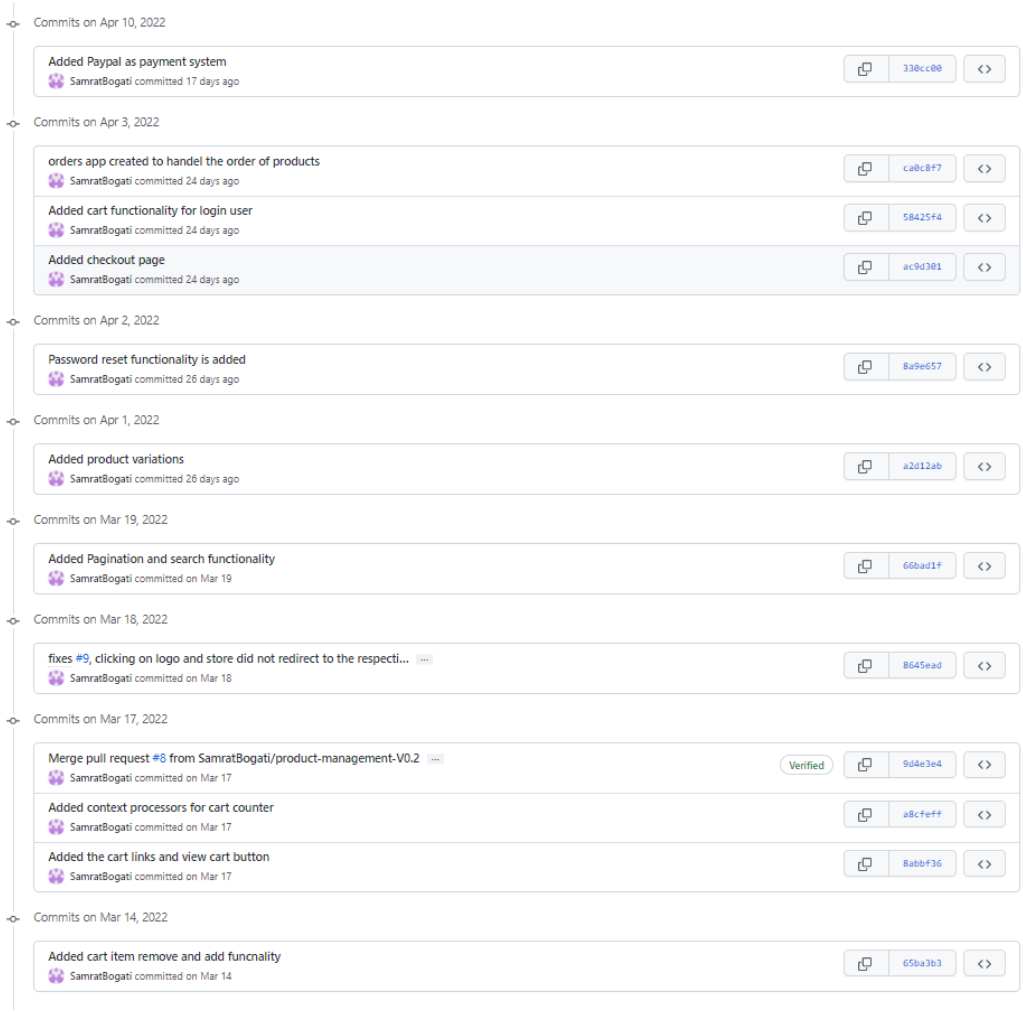

Figure 75: Git commit 4

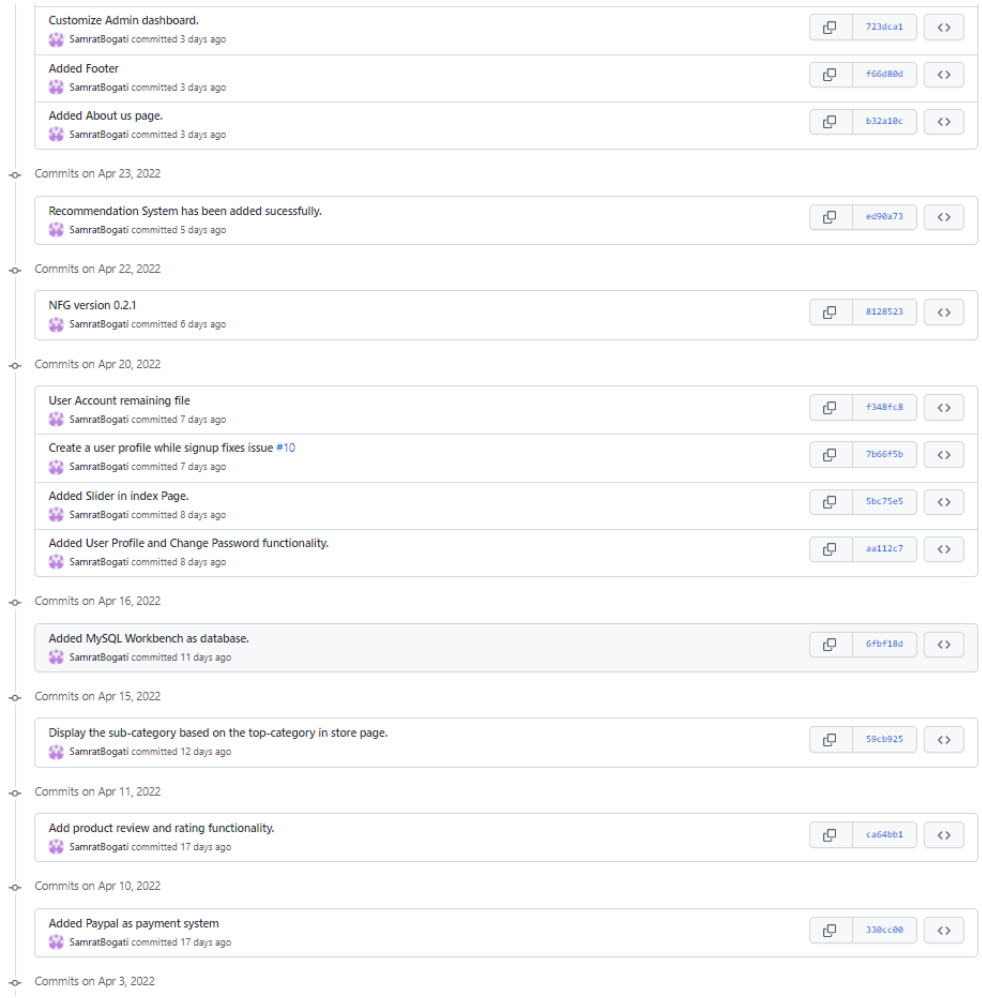

Figure 76: Git commit 5

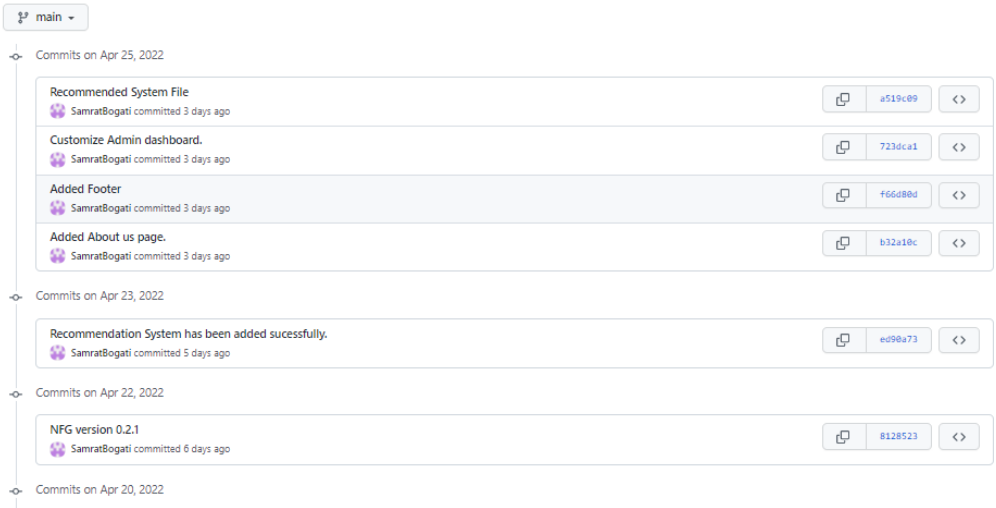

Figure 77: Git commit 6

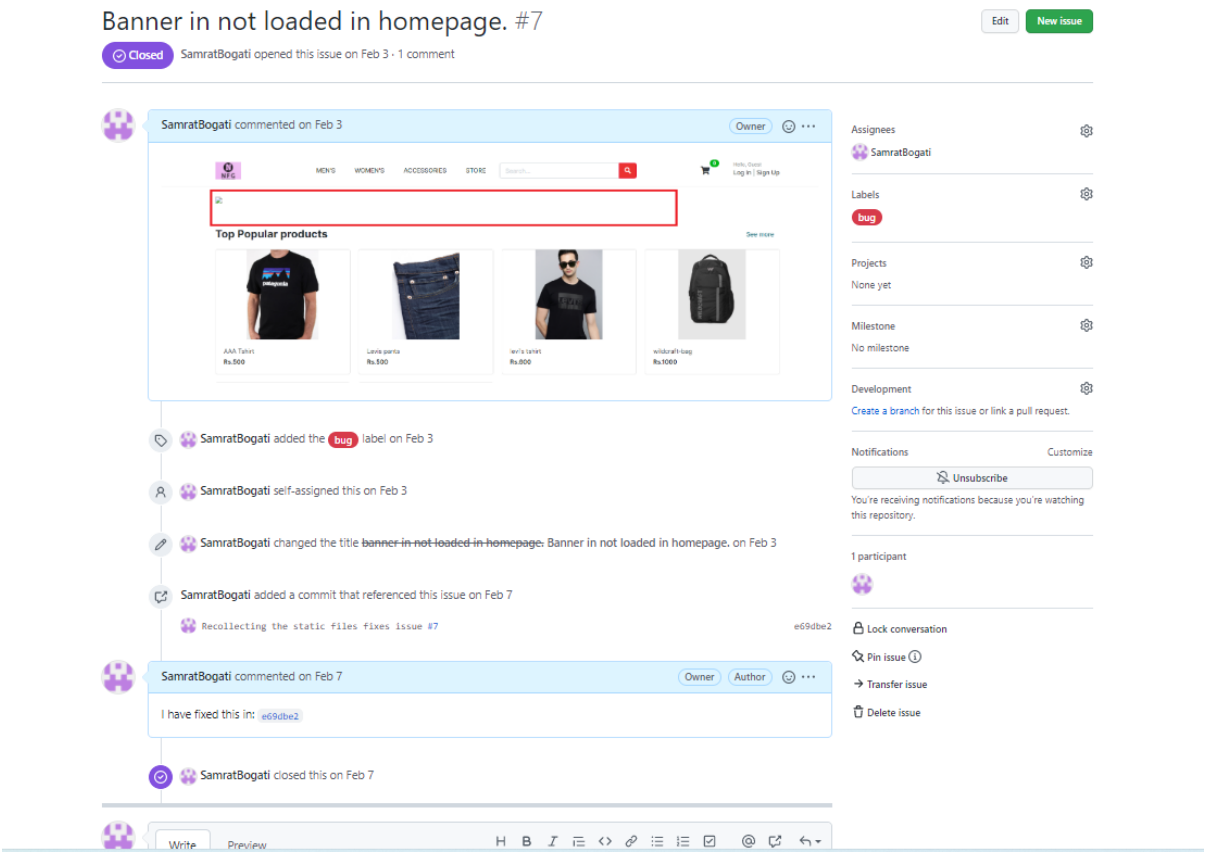

Figure 78: Git issue 1

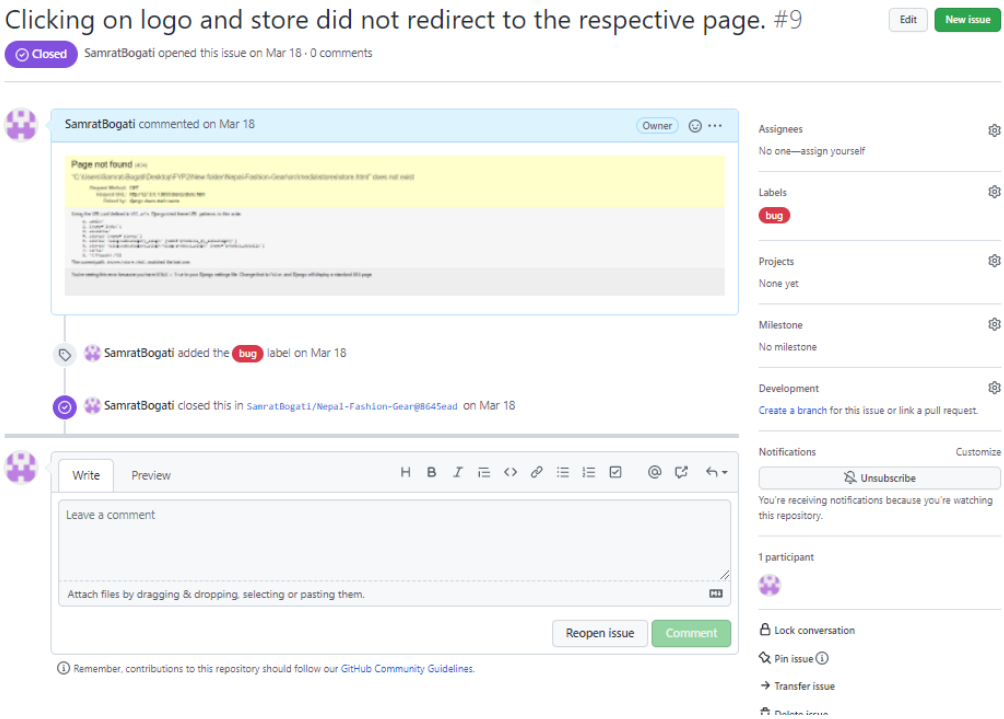

Figure 79: Git issue 2

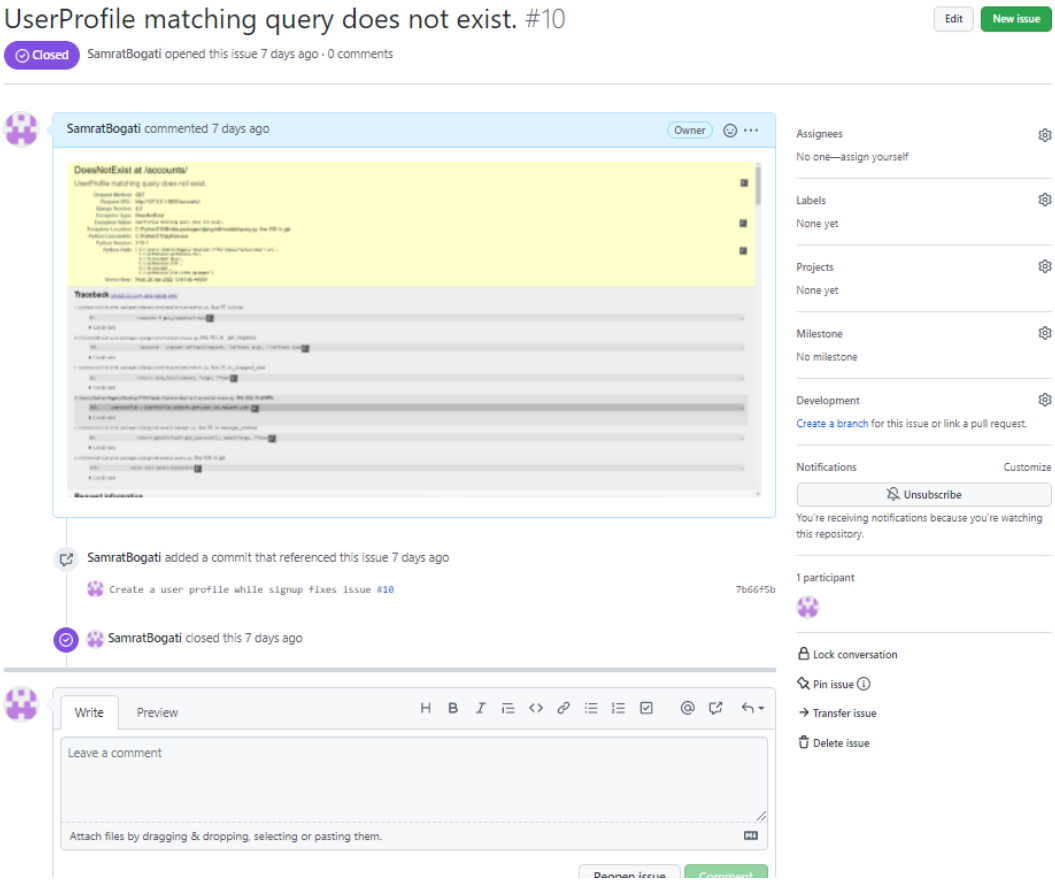

Figure 80: Git issue 3

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