

Declaration Sheet

Award Title: *BSc(Hons) Computer Science*

Declaration Sheet

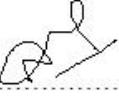
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Abstract

Gharko Pasal is an ecommerce website dedicated towards ‘Made in Nepal’ items. Thus, products that are only manufactured in Nepal are sold in this site. The system is being created to provide light of exposure to ‘Made in Nepal’ product in Nepalese market. It is focused on providing authentic and genuine product by selling genuine and authentic product from authentic merchants. System in this case study has various artifacts such as user management system, product management system, payment system, Realtime chat system and Recommendation system which are discussed briefly with critical observation in a presented report.

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1. Introduction

1.1. Project Briefing

Considering a market of ‘Made in Nepal’ products, it is seemed to be overshadowed by imported goods despite of being much cheaper and of higher quality. As of this sole reason this system is created and targeted towards local and homemade products, that are manufactured in Nepal but are rarely found in Nepal due to lack of exposure.

Gharko Pasal is a feature rich E-commerce website. E-commerce refers to the purchasing and selling of goods and services, as well as the transmission of payments and data, over an electronic network, most commonly the internet. This system is aimed to provide limelight and exposure to homemade products, such as but not limited to leather products line Shoes, bags, jackets; Woolen clothes, Watches, Carpets and every item that can be sold and made locally. International brands and items are restricted for sale in a website. It provides direct platform for local market that results in commission cut of mid agents thus items can be found in a cheaper price direct from a manufacturer. Daraz, Sastodeal, Hamrobazar etc. are some popular names in Nepalese E-commerce. But due to lack of transparency it is found that costumers are being scammed. To overcome this limitation presented system will allow only verified merchant to sell their item if they pass certain criteria of quality check. Globally, E-commerce amounted about 5.1 percent of overall retail sales in 2007, while it now accounts for 16.0 percent in 2019. (Chai, 2020) resulting rise in respective countries economy. If initiated as proposed this system might affect country economy but in a positive way.

Scrum methodology, known as iterative technique of software development, was practiced in order to meet a deadline. Gharko Pasal comes well equipped with artefacts such as, User management system, Realtime Chat system, Payment management system and Recommender system.

As the system consists of recommendation system and it addresses machine learning, Recommender system is based on content-based recommendation algorithm. It recommends items based on similarities of a product. It is based upon a supervised learning; it uses labeled dataset to train algorithms and make prediction of outcome.

1.2. Academic Questions

- Is there any e-commerce in Nepal targeted toward local brands?
- How imported items are affecting country economy?
- Does any e-commerce in Nepal check quality of an item and operates only with verified merchant?

1.3. Aims and Objectives

1.3.1. Aims

“Think Globally, Act Locally”, a popular slogan introduced by British scientist, planner and conservationist, Patrick Geddes (Groom, 2019) is a motivation behind this project as the system is being created to provide light of exposure to ‘Made in Nepal’ product in Nepalese market.

The main aim of this case study is to promote homemade and Local products. It is a platform to gain limelight for those thousands of local products that are being overshadowed by international brands. It is also focused on providing authentic and genuine product by selling genuine and authentic product from authentic merchants.

1.3.2. Objectives

- Creating an online store where item can be shipped direct from manufacturer to reduce a need of physical store
- Connecting both of the parties with a help of Realtime chat.
- Recommending item based on content-based recommender system.
- Using certain API to complete online payment procedure.

1.4. Artifacts

Artefacts are commonly known as the ‘Things’ that are to be created during a Software development Life Cycle. There are lists of artefacts in SDLC that a developer should produce till the end. User management System, Payment System, Realtime chat System and Recommender System are the artefacts of ‘Gharko Pasal’. These artefacts are well described here, and Functional Decomposition Diagram is also being provided to give much wider perception of a system.

FDD for Gharko Pasal

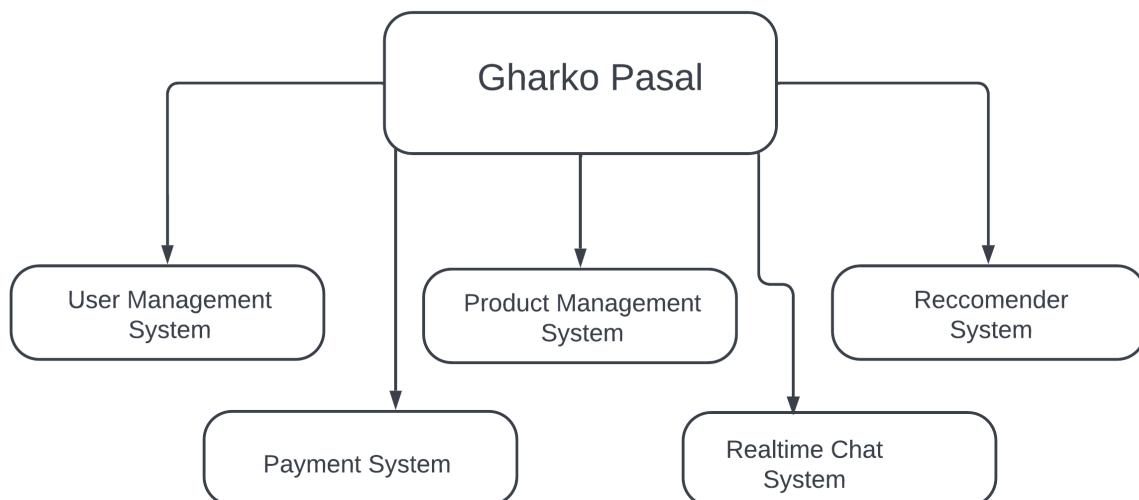


Figure 1: Functional Decomposition Diagram for Gharko Pasal

1.4.1. User management system

User management system is used to manage users. There are two types of users: administrator users and normal users. Admin can make various changes to a site such as adding product in a system, creating variation for products, removing products and much more. Normal users can visit and interact on a website. They can buy products, make comments about a product, and review product as well. Admins can also perform same tasks a normal user, but their ability to remove normal user from the system put them in a higher level of hierarchy. Django, a python framework for web development; was being used to create a user management system on backend whereas bootstrap was used on frontend. It also stores information such as users name, contact information, address as well as email addresses.

1.4.2. Product Management System

Similar to user management system, product management system is used to manage products instead of users. Admin can add and modify products, add, and modify products categories and variations. Admin user also has permissions to completely remove products from a cart. It stores products information such as product name, product id, product price, stocks, and available status. For an e-commerce website whose main idea is to sell product online product management is a crucial artefact.

1.4.3. Payment System

It is crucial artefact of any e-commerce website. E-sewa was proposed to be used as a payment system but it refused to provide API as certain criteria were not met as per their company policy. Thus, PayPal was used as a payment system. Payment is protected by Secure HTTPS connections and strong TLS configurations, Strong TLS configurations are the current industry standard for trusted communication channels, allowing your data to be securely transmitted across the internet. It also provides key pinning which ensure connection to native servers. Email confirmations and security pin are also added for higher security. SSL (Secure socket Layers) is used for encryption of data between server and user. (PayPal, 2022)

1.4.4. Realtime chat system

Sometimes product descriptions and images are not enough for a costumer to make a purchase. They need to communicate with merchant before purchasing a product. There are several means of communication such as phone call and an email. But having a built-in chat system takes interaction between both parties to a next level. Thus, real time chat system is integrated into a system. Same as user management system, Django is used for a backend and a bootstrap for a front end in order to successfully create an artefact.

1.4.5. Recommended System

Recommender system is based on content-based recommendation algorithm. It recommends items based on similarities of a product. For example, when visiting any online store and red cotton shirt is selected there might blue cotton shirt in recommendation or when warm jacket made up of leather is selected there might be leather jacket with wool inside on recommendation. It all happens because of content-based algorithm.

1.5. Scope and limitations

The main motivation of this case study is to create a functional e-commerce website that possess variety of artefacts which might help to bring exposure to homemade products as discussed in above section of a report. The scope of this system can be availability of Nepali product in Nepalese market which also might have potential to reach global. The case study is not restricted by regions.

As of limitation, password field has no specific criteria during registration process. It does not require any specific character or certain number of letters. Due to my lack of understanding I was unable to implement machine learning based recommended system which is also major limitation in the product. Other than recommendation system, developed system is fine.

1.6. Report Structure

Presented Report consists of following Structure:

Introduction: It includes project briefing, a general introduction about the system

Literature Review: Sources are being collected from several articles, journal, papers, reports to enhance the individual knowledge about the system and the idea of a system.

Project Methodology: This Section answers questions like why particular methodology was chosen and how it helped in software development life cycle.

Tools and technology: It consist of an information of tools and technology that were being used from beginning to end. Such as programming language, designing tool etc.

Artifacts Design: It provides a visual and graphical representation of a system as well as testcases

Conclusion: short summary of a case study and discoveries as well as conclusion of report can be found in this section.

Critical evaluation: It consists of findings and process, information about planning management and sources found and self-reflection of a such as what did he/she learn, and how it helped his/her self-development.

Evidence: Log sheets and Gantt Chart

2. Literature Review

Numerous of published information regarding specific field of case study from various books, articles, journals of academic merits are discussed in this certain section of a report. As it can be too comprehensive to include each and every detail from sources, key points from the certain topics such as what has already been done, what is widely recognized and its current states are being reviewed, compared and highlighted here. Moreover, own critical evaluation and argument related to a case study is also being presented within a section.

2.1. Growth of E-commerce

It is stated that the growth of e-commerce began to expand when the concept of “Think Globally” was introduced, an idea focused on broadening individual’s perspective to see thing from others point of view with genuine interest and no judgement. It assisted in guiding customers to one platform in a form of Electronic Store that provided wide range in products of people’s interest which was nearly impossible in case of physical stores.

These days, customers want each thing in one place as a consequence of their limited time. As the use of smart phones increased, popularity of e-commerce as well was also increased simultaneously. Later availability of cheaper smart phones gave them more fame. Electronic stores on e-commerce platforms are not always pricey, but rather provide a wide choice of products of various price ranges, as well as product categorization for each age group and gender.

Geographical barriers are also blurring, several brands despite of their origin, are available to other customers in their location, making process of buying more convenient. This characteristic of convenient purchasing has increased the desire for e-commerce. Governments have also begun to invest in such business scenarios since they help to attract a large amount of investment in the form of expansion in the ecommerce industry (Sherfudeen, et al., 2020).

2.2. Use of Machine Learning in E-commerce

Machine learning, a sort of Artificial Intelligence in which computers are able to enhance and adjust their processes on their own without any human supervision, has shown to be exceptionally useful for individuals who offer items or services online. E-commerce is believed to be one of the first businesses to adapt machine learning to its full potential. Machine learning algorithms are now available for practically every aspect of e-commerce (Rath, 2020).

- Product Recommendation

It is an information filtering tool that employs machine learning techniques to suggest the most relevant content to users in which they might be interested in. It is based on a principle of analyzing

patterns in user behavior data. Popular sites such as Netflix, Amazon, eBay, Shopify, and many other uses recommendation engines to improve their traffics. Netflix uses it for movie suggestions based on user behavior. Amazon, eBay, Shopify on other hand use it to recommend their products. As there might be various motives to use recommender system but a goal is common; to increase sales and engagement.

- Chatbot

Customer service is considered to play a vital role for any firm or institution in order to generate revenue and maintain a lasting customer. It is also a most resource hungry department of a company as thousands of staffs needed to be employed. There are two major complications with traditional method of customer service. First, it is nearly impossible for a staff member to answer all types of questions. Second, it is nearly impossible to provide 24/7 service. To overcome this drawback Chatbots are used in e-commerce which can drastically decrease resource consumption. On other hand chatbots can answer most types of solution if it is on their database and 24/7 service can also be easily provided. (Cui, et al., 2017)

- Fraud Detection

Scammers are successfully exploiting the resulting vulnerabilities, finding creative ways to target security throughout every stage of businesses' interactions with customers as a result of the convergence of on-site and online buying. As a result of a growing customer shift away from in-store sales and toward online purchases, online retailers are particularly vulnerable. They face an excessive workload of transactions, orders, and deliveries. Card Testing Fraud, Chargeback Fraud, Refund Fraud, Loyalty Fraud are some of the common anomalies in ecommerce. With a help of Machine learning algorithms, AI can reject transaction in case of unfamiliar behavior and mark them for additional investigation. Thousands of variables are extracted from each transaction, and billions of data sets are analyzed with a help of machine learning algorithms to keep sales secured (Pallathadka, et al., 2021).

2.3. Barriers in developing countries

For emerging countries, e-commerce is expected to be a new determinant of economic development. It is believed as a result of the opportunities provided by Internet technologies, which are also a requirement for ecommerce, ecommerce might grow quickly and assist developing countries in overcoming their problems of exclusion from the global economy and improving the terms of their participation. Despite having many positive sides, some critical barriers are found that can directly poses negative impact to a prosperity of e-commerce in a developing country. These barriers are briefly discussed here:

- Lack of Education and IT infrastructure

Most of the developing country's IT infrastructure is either insufficient or non-existent. There are numerous regions where there is no internet and others where 3G internet service is still available as the world transitions to 5G. Thus, majority are unable to get internet-based services like e-commerce. Majority of population were also found to be lacking knowledge about new available technologies. Courses taught were only related to same field instead of knowledge oriented and lacked IT aspects (Khahro & Hassan, 2021) .

- Low-income group, Expensive Internet

Poverty prevents individuals from receiving an education, training, or benefiting from the usage of technology. According to a data publish by world bank, most of the developing countries were found to be low-income countries with an average annual income less than USD 1026 (The World Bank, 2020). Average cost of internet was found to be 29 \$/month -299\$/month and individuals must pay separately for gadget. In such case scenario, where population is hardly able to fulfil their basic needs of survival, development of internet-based technology is beyond imagination.

Country	GNI per capita* ▾	2022 Population
Yemen	940	31,154,867
Mali	870	21,473,764
Ethiopia	850	120,812,698
Rwanda	830	13,600,464
Guinea Bissau	820	2,063,367
Burkina Faso	780	22,102,838
Uganda	780	48,432,863
Gambia	750	2,558,482
Chad	700	17,413,580
Togo	690	8,680,837
Eritrea	600	3,662,244
Niger	600	26,083,660
Sudan	590	45,992,020
Liberia	580	5,305,117
Sierra Leone	540	8,306,436
Afghanistan	530	40,754,388
DR Congo	530	95,240,792
Central African Republic	520	5,016,678
Madagascar	520	29,178,077
Mozambique	490	33,089,461

Figure 2 GNI per capita of developing countries (World Population Review, 2022)

- Total Negligence

Majority of population were deeply attached in conventional way of shopping and found to have limited vision of productive opportunities result they do not want to switch to any other alternatives (Khahro & Hassan, 2021).

2.4. Initial Research

2.4.1. Based on Journal of Contemporary Issues in Business and Government

eCommerce

Electronic commerce is referred to as e-commerce. It refers to the use of electronic media and the internet to transact products and services. E-commerce refers to a company's use of the internet and IT, such as electronic data interchange (EDI). There are six types of e-commerce business such as Business-to-Business (B2B), Business-to-Consumer (B2C), Consumer-to-consumer (C2C), Consumer-to-business (C2B), Business-to-administration (B2A), Consumer-to-administration (C2A). One of the most important benefits of ecommerce to businesses is cost reduction, which keeps sellers interested in selling online and faster buying process. Many vendors have to pay a lot of money to keep their physical store running. Security, Site Crash, Late delivery and lack of privacy are considered as some of its demerits. (jain, et al., 2021)

2.4.2. Based on Journal, Knowledge-Based Systems

Recommender System

Recommendations are executed in two ways: either collaborative filtering or content-based filtering. Collaborative filtering techniques build a model based on a user's previous behavior as well as comparable decisions made by other users to anticipate items (or ratings for items) that users may be interested in [16]. Content-based filtering techniques recommend more items with similar attributes based on a number of distinct characteristics of an item. Both approaches can be used to form hybrid recommender systems. Other unique strategies, such as social networks and semantic information, can be included into recommendation systems. Content based recommendation is based on the idea that things with similar characteristics should be ranked similarly. Text documents are the most common information source for content-based filtering systems. (Wang, et al., 2018)

2.4.3. Based on a report published on Seoul National University

Realtime Chat

In a modern world, more communities are using internet chat as a platform for discussing issues and making choices. Because of its ease of use and familiarity, online chat has become popular for community debate, as it allows more people to participate without being limited by geography. Online chat is also socially engaging, with research indicating that the dynamics of online chat discussions are like those of face-to-face conversations. The synchronous structure of online chat, on the other hand, may feel too quick making it difficult for participants to maintain track of the conversation and follow up on a missed one, limiting its efficacy in discussing critical community issues. (Seoul National University, 2020)

2.4.4. Based on International Research Journal of Engineering and Technology (IRJET)

Payment System

In modern world, online purchasing with a credit card or a debit card is widely used ecommerce application. The convenience of buying and selling things over the Internet is the primary cause for the expansion of e-commerce transactions. This study by Sheng-Uei Guan, Feng Hua, and colleagues proposes a multi-agent mediated electronic payment architecture. Its goal is to provide an agent-based strategy that can accommodate a variety of e-payment systems. The system demonstrates high scalability thanks to a layered payment structure and a well-defined standard payment interface. (Kalbande, 2019)

2.5. Similar Research

2.5.1. Similar System

- **Daraz**

Daraz is a south Asian most popular online marketplace which is successfully operating in Pakistan, Bangladesh, Sri Lanka, Myanmar, and Nepal. connecting thousands of businesses with millions of buyers. Daraz delivers more than 5 million shipments each month across the region, it

provides fast and hassle-free access to more than 49 million items in over 99 categories. For its customers and vendors, Daraz is a marketplace, a mall, and a whole community on itself. It aims to improve level of ecommerce in South Asia by creating a consistent ecosystem that includes end-to-end solutions in e-commerce, shipping, payment infrastructure, and financial services. Alibaba Group acquired Daraz in 2018, Daraz combines Alibaba's worldwide leadership and experience in technology, electronic commerce, phone payments, and logistics to accelerate growth in its regions by being a part of Alibaba ecosystem (Daraz, 2022).

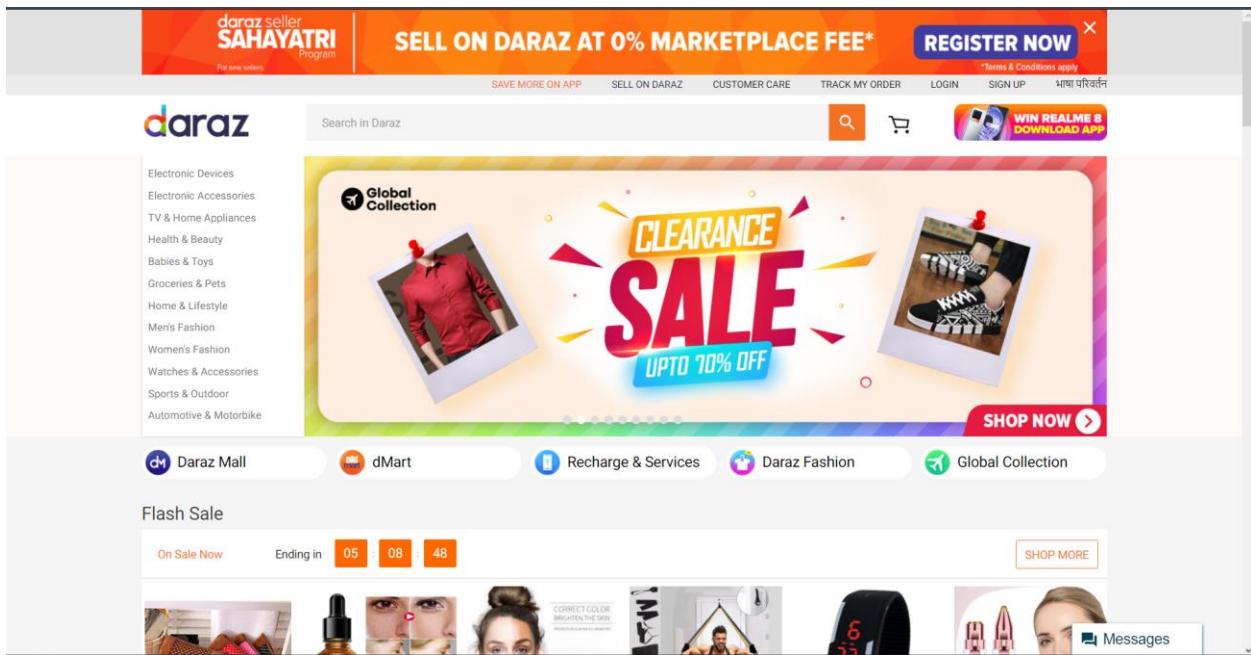


Figure 3: Home page of Daraz

- eBay

eBay is a popular multi-national online shopping site known for its auctions and direct-to-consumer sales. It's also very popular among internet retailers used as a sales channel (eBay, 2021).

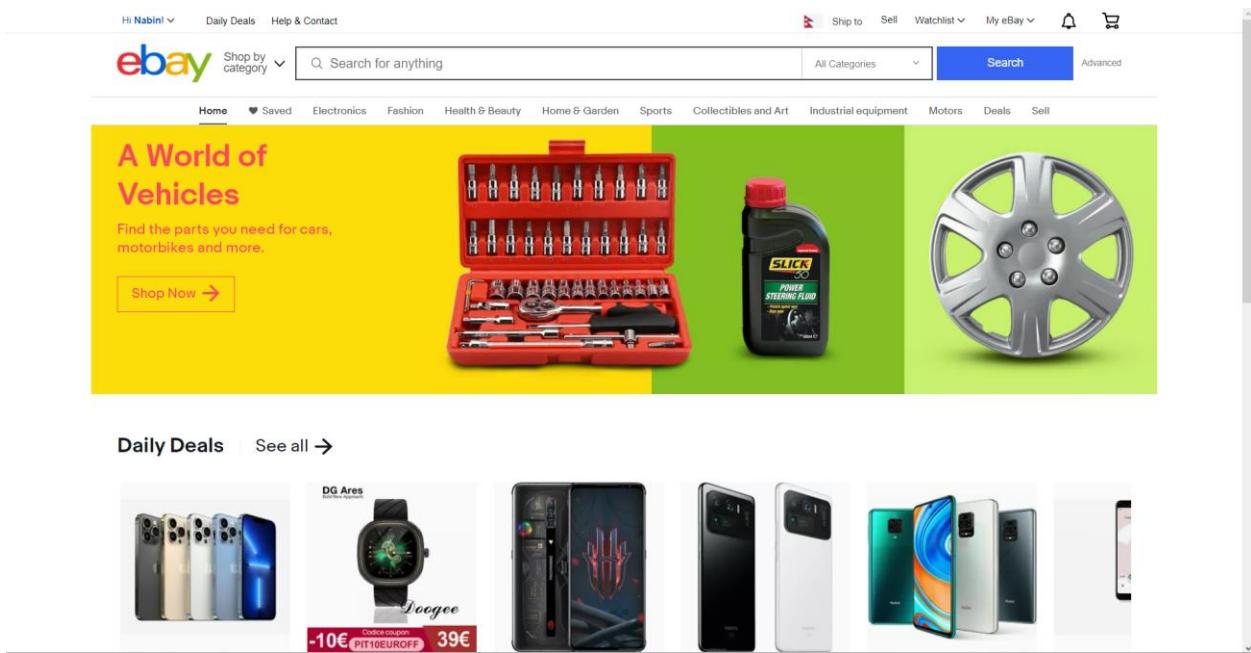


Figure 4: Homepage of eBay

2.5.2. Similarities between the above-mentioned system and proposed system

- All of them are Ecommerce system.
- Content Management Capabilities
- Integrated with easy-to-use checkout.
- Multiple payment options such as credit card, Visa, Mastercard etc.
- The ability to scale & add new eCommerce features
- Available for both Mobile and PC devices.

2.5.3. Difference between above mentioned system and proposed system

eBay	Daraz	Gharko Pasal
------	-------	--------------

• Both used and new product can be sold.	• Used items cannot be sold	• Only made in Nepal unused items are sold
• Offers bidding/auction on items.	• No Bidding System	• No Bidding system
• Supports Realtime chat	• Does not support Realtime chat	• Supports Realtime chat
• Real state cannot be sold	• Real state cannot be sold	• Real state cannot be sold
• Complementary Item Recommendations is usedInvalid source specified.	• No specific Recommendation system is mentioned.	• Content based Recommender System will be used

Figure 5: Table of differences

2.6. Chosen Recommended System

2.6.1. Content Based Recommendation System

It assists users to suggest goods that are comparable to those that have previously been scored positively. It's based on the idea that things with similar characteristics should be ranked similarly. Text documents are the most common information source for content-based filtering systems. The elements are described using a collection of descriptors or terms, most often Term Frequency (TF) and Inverse Document Frequency (IDF). It recommends items based on similarities of a product. When viewing red cotton shirt in some online store there might blue cotton shirt in recommendation or when warm jacket made up of leather is viewed there might be leather jacket on recommendation. It all happens because of content-based algorithm (Wang, et al., 2018).

2.6.2. Why Content Based Recommendation System?

- It does not require any specific data about its user as suggestions are specific to a certain user. As a result, substantial number of users can be scaled easily.

- Content based recommendation algorithm can recognize a user's individual preferences and make recommendations for specialized things that only a few other users might be interested in.

2.6.3. Underlying Math behind system

The elements are described using a collection of descriptors or terms, most often Term Frequency (TF) and Inverse Document Frequency (IDF).

Term Frequency: The proportion of the current document's word frequency to the total number of words in the document. It denotes the frequency with which a word appears in a document and assigns a higher weight when the frequency is higher, therefore it is divided by the length of the document to normalize.

$$Tf(t) = \frac{\text{Occurrence of } t}{\text{Total number of } t}$$

Inverse Document Frequency

The ratio of the total number of documents to the frequency of documents containing the word. It denotes the rarity of the word; as the number of times the word appears in a document decrease, the IDF rises. It aids in giving rare terms in documents a higher ranking.

$$Idf(t) = \log_{10} \frac{\text{Total Number of Document}}{\text{Number of document with } t}$$

Finally, the TF-IDF is a metric for determining how essential a word is to a document in a corpus of documents. The importance of a word rises in direct proportion to the number of times it appears in the document, but this is counterbalanced by the term's frequency in the corpus.

When TF-IDF value for tags are defined, keyword vector for each item can be made. The recommender will then provide recommendations based on the items that are most identical.

(Wang, et al., 2018)

3. Project Methodology

3.1. Agile Methodology

Agile Methodologies are a collection of software development methodologies that are iterative and incremental in nature. Agile techniques attempt to produce the proper product through small cross-functional self-organizing teams that supply small pieces of functionality on a regular basis, allowing for frequent customer input and course correction as needed. (Balaziuk, et al., 2020).

3.1.1. Why Agile Methodology?

- It is quick and easy to adapt changes

Agile teams are not only encouraged to adapt to change, but they are also expected to embrace it. Agile understands that client needs evolve over time, and that teams must be adaptable to meet those changes. Working in timed iterations reduces the need for a time-consuming requirement change, review, and approval process. Any maintenance or update item is added to the backlog and assigned to a future sprint based on importance and requirement.

- Dates of delivery can be predicted

The standard waterfall project strategy takes a long time and makes it difficult to anticipate a release date. Agile iterations are time-boxed, and at the end of each sprint, working products are ready to be released.

- Higher quality of product

In this methodology, all features of a product are not implemented at once. Instead, They are implemented one by one as following each sprint. As it is depended on continuous integration developer's work is shared on respiratory multiple times, which enables to test issue on a regular basis. Thus, the higher quality of product. Regular sprint meeting also helps to increase quality of product.

- Risks are reduced

Sprint development ensures a short interval between feature development meaning one can have extra time, changes are also easy to adapt as per various need. It also follows iterative development process; thus, risks are reduced drastically.

3.1.2. How agile helped in project development?

Agile methodology-based SCRUM is being used as a development manifesto. Here is how agile was implemented during system development.

- Regular sprint meetings were conducted
- Gantt-chart was built for project planning
- Project was divided into various milestones to reduce burden
- Various testings were performed on timely routine that helped in identification and minimization of issues.

3.1.3. Scrum

It is a subset of Agile and a methodology practiced throughout a project. Scrum allows for a considerable boost in productivity and a shorter time to benefits. Scrum methods allow firms to quickly adjust to changing needs and generate a product that is in line with changing corporate goals.

Scrum was practiced throughout a project in a duration of six months. Product Backlogs were created for all the tasks and were being worked accordingly as a part of the project. Several sprint meetings were conducted in the presence of supervisor and readers. Feedbacks were provided on a timely basis regarding the system for improvisation as well as development was tracked. Goal of each sprint was the four subsystems. And as per rule of scrum, Sprint Retrospective were held to ensure what went wrong and what can be improvised on previous sprint. It helped to adapt changes for upcoming sprints by not repeating previous mistakes.

How was Scrum practiced in system development?

Here is how scrum was practiced in system development.

- Organizing the backlog

List of all the prioritized tasks throughout the project was created in a form of backlog and practiced accordingly. Product s were being created at beginning of a project where sprint backlogs were created after each sprint. It can be considered as decision making artifact.

- Sprint Planning

The tasks to be performed were discussed with a supervisor during sprint planning. Sprint backlogs were made during this phase. There were sprint plannings after each sprint completion till product development was completed.

- Sprint

It is an amount of time separated to complete certain portion of a work. Each subsystem were developed in each sprints. As main system consists of four sub systems a single sprint a month long and there were 4-5 sprints. Considering a total duration which is about five month long.

- Sprint Review

There were meetings held on each Sunday with allocated supervisor and workflow of a sprints were discussed. Additional changes might be made, or additional functionality might be removed depending upon evaluation of a supervisor.

- Sprint Retrospective

Sprint Retrospectives were held to ensure what went wrong and what can be improvised on previous sprint which can be avoided and adapted in an upcoming sprint.

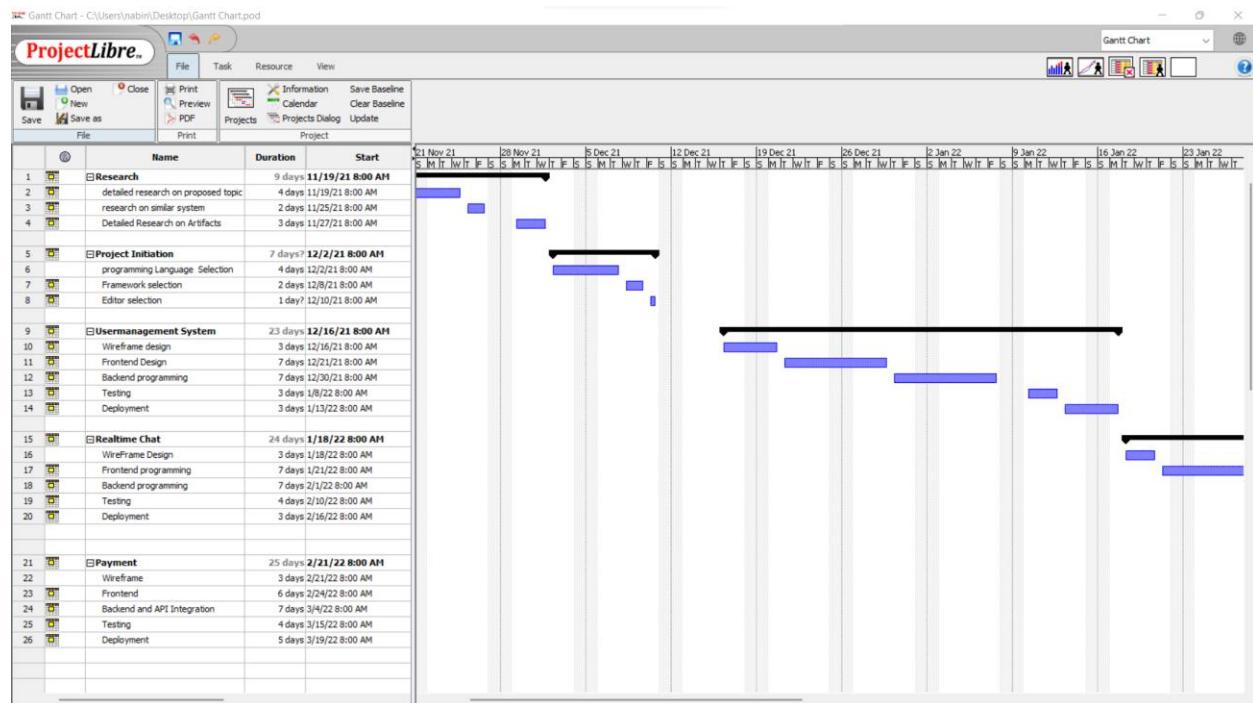
Why is Scrum practiced in this project?

- Scrum enables the development team to work parallelly rather than in sequence.
- Scrum allows for flexibility. Changes can be made into an ongoing project.
- Scrum relies on productivity through communication and planning, giving teams the ability to come up with new approaches to solve problems.

(Rubin, 2019)

Gantt chart

A Gantt chart is a graph that shows the quantity of work or production performed during various time periods in relation to the amount scheduled for those times. Gantt charts help organizations to organize their work, improve overall project visibility, and keep everyone on schedule.



Note: Detailed Gantt char is presented below in Evidence

4. Tools and Technologies used

4.1. Programming language and Frameworks

4.1.1. Programming Language: Python

It is programming language widely used for web development, machine learning and data analysis.

Reasons behind using python as a programming language

- Python is easy to learn and has simpler syntax.
- It has wide range of frameworks to get a desired job done and has vast online support community.
- Has vast support of libraries
- It is free and open source; thus, project can be used in multiple Operating Systems.

4.1.2. Frameworks used: Django (Backend)

Django is a high-level python programming language-based frame popular for web development securely.

Reasons behind using Django as a backend programming language

- As application is web-based Django is widely used for web development
- It supports built in Admin UI which is mainly being used in a system
- Provides access to huge built-in libraries and packages.
- It is well established that has big and supportive communities.
- It is well known for avoiding common securities breaches like clickjacking, cross-site-scripting, and SQL injection. Thus, it is also more secure

4.1.3. Frameworks used: Bootstrap (Frontend)

Bootstrap is a free and open-source CSS framework aimed at front-end web development that is responsive and mobile-first. It features fonts, forms, buttons, navigation, and other interface design templates built with HTML, CSS, and JavaScript.

Reasons behind using Bootstrap as a backend programming language

- It provides templates for almost every section of webpage thus it massively saves time and increase speed of a development
- Bootstrap is automatically responsive from device to device
- It has JavaScript's plugins means JavaScript can be used without actually writing a code and launch your queries.
- Follow grid-based system so it is easy to learn even for beginners
- It is cross platform and can be accessed from any OS

4.2. Tools

4.2.1. Visual Studio Code as IDE

Visual studio code was used as a code editor for following reasons:

- It is free to use and open source
- Its supports multiple programming languages
- It is feature rich, Syntax highlighting, bracket-matching, auto-indentation, box-selection, snippets, and more are all available in VS Code
- It has minimal user interface design and supports wide range of extensions

4.2.2. GitHub for version control

It is version control tools used for managing and tracking development process, as well as keeping backups.

Why GitHub?

- It was used to keep track to a project as well as backup
- Project collaboration was made easy with a supervisor as whole project can be found online in a repository.
- It is free and open source

Other Tools

Microsoft Office: For report Writing

Figma: For Wireframe

Project Libre: For making Gantt Chart

Use of any packet manager

Models packages are being used in Django based website. It contains essential fields and behavior of data being stored.

5. Artifacts Design

FDD for Gharko Pasal

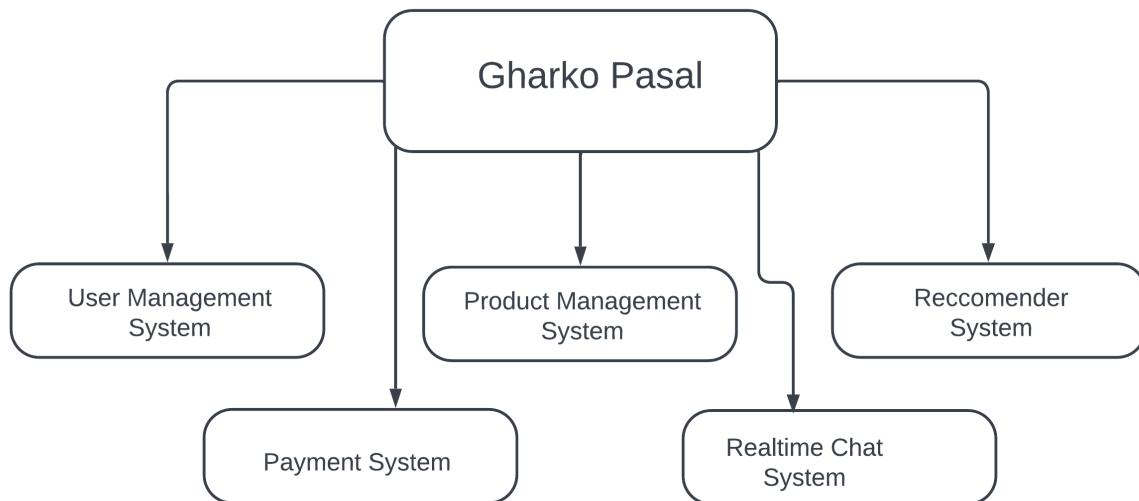
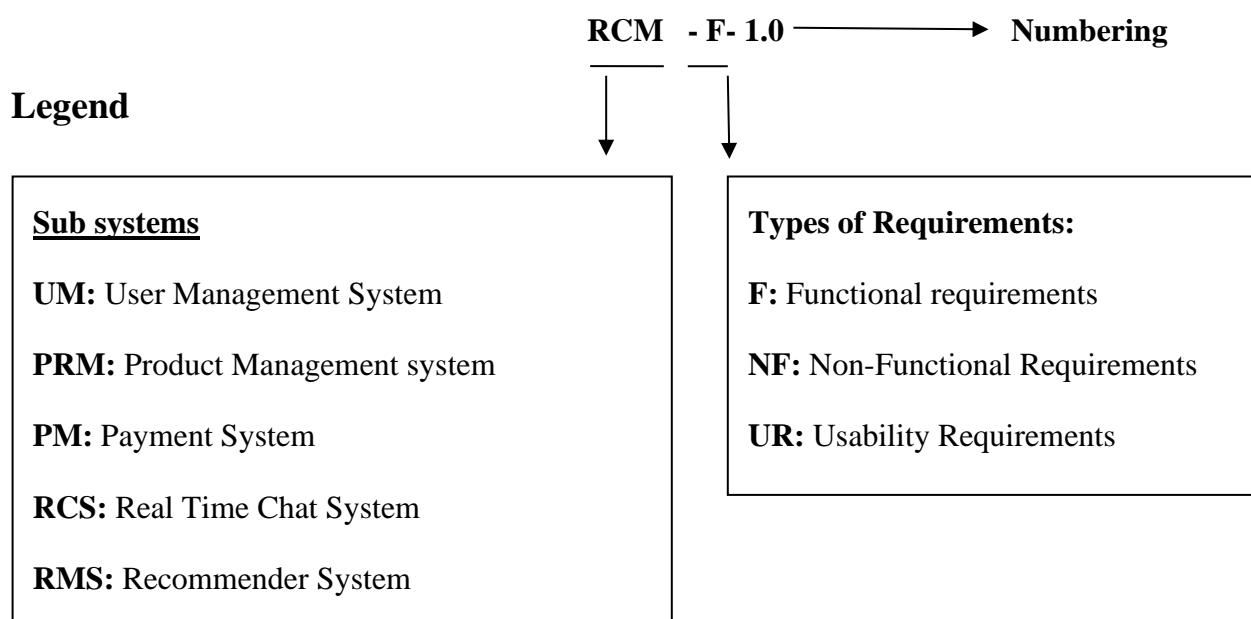


Figure 6: FDD diagram of Gharko Pasal

5.1. Software Requirement Specification table (SRS Tables)



5.1.1. User management system

SRS Table

Requirement Code	Requirement Specification	Testing ID
UMS-F-1.0	The system should allow user to register themselves	TC-01
UMS-NF- 1.1	Proper email address should be provided i.e., Email address must have '@'	TC-02
UMS-NF- 1.2	Both ‘Create Password’ and ‘Confirm Password’ must have same value	TC-03
UMS-NF- 1.3	Email address should not exist in a database	TC-04

UMS-NF- 1.4	Email verification should be sent to a respective email address in order to successfully create an account	TC-05
UMS-UR- 1.1	Error message should pop up all field left empty is invalid	TC-06
UMS-UR- 1.2	Alert message should pop up after sending email verification	TC-07
UMS-F-2.0	Admin user should be able to remove normal user	TC-08
UMS-F-2.1	Admin user should be able to ban/unban the normal user	TC-09

SRS Testing Table of UMS

TC ID	NAME	SRS ID	STEPS	Dataset	Expected	Act ual	Res ult
TC-01	Registration	UMS-F-1.0	Navigate to register in homepage and add details, then click “sign up”	FirstName: Nabin LastName: Rayamajhi Email: nabinrmc5@gmail.com Phone: 9803100579 Password: Adminus Confirm Password: Adminus	We have sent verification link to your email address		

TC-02	Email criteria	UMS -NF- 1.1	Navigate to register in homepage and add details with wrong email format, then click “sign up”	FirstName: Nabin LastName: Rayamajhi Email: nabinrmc5@gmail.com Phone: 9803100579 Password: Adminus Confirm Password: Adminus	Invalid email address		
TC-03	Password match	UMS -NF- 1.2	Navigate to register in homepage and add details but different password in ‘confirm password’, then click “sign up”	FirstName: Nabin LastName: Rayamajhi Email: nabinrmc5@gmail.com Phone: 9803100579 Password: Adminus Confirm Password: AnuAanun	Both password field should be same		
TC-04	Used email	UMS -NF- 1.3	Navigate to register in homepage and add details, then click “sign up”	FirstName: Nabin LastName: Rayamajhi Email: nabinrmc5@gmail.com Phone: 9803100579 Password: Adminus	Email address already taken		

				Confirm Password: Adminus			
TC-05	Send verification email	UMS -NF- 1.4	Navigate to register in homepage and add details, then click "sign up"	FirstName: Nabin LastName: Rayamajhi Email: n.rayamajhi01@gmail.com Phone: 9803100579 Password: Adminus Confirm Password: Adminus	Email verification send to respective email		
TC-06	All Empty Field	UMS -UR- 1.1	Navigate to register in homepage, then click "sign up" without adding details	NULL	Please enter your details		
TC-07	Alert Email verification	UMS -UR- 1.2	Navigate to register in homepage and add details, then click "sign up"	FirstName: Nabin LastName: Rayamajhi Email: n.rayamajhi01@gmail.com Phone: 9803100579	Alert		

				Password: Adminus Confirm Password: Adminus			
TC-08	User Remove	UMS -F- 2.0	Click on 'Account' in admin dashboard, select user and proceed to delete		User successfully deleted		
TC-09	Ban user	UMS -F- 2.1	Click on 'Account' in admin dashboard, click on user, it shows details and then check on 'inactive'.		User inactive		

5.1.2. Product Management System

SRS Table

Requirement Code	Requirement Specification	Testing ID
PRM-F-1.0	System should allow admin to create a product	TC-01

PRM-NF-1.1	Admin should add short description, product price, availability status of a product as well as image.	TC-02
PRM-NF-1.2	Product cannot be added without categories	TC-03
PRM-UR-1.1	Slug should be same as product name and must be added automatically	TC-04
PRM-F-2.0	System should allow admin to create a product category with short description	TC-05
PRM-F-3.0	System should allow admin to create a product variation such as 'blue-large shirt'	TC-06
PRM-UR-3.1	Variation category should be entered without value	TC-07
PRM-F-4.0	Admin should be able to remove cart items	TC-08

Testing Table

Requirement Code	Requirement Specification	Testing ID
PRM-F-1.0	System should allow admin to create a product	TC-01

PRM-NF-1.1	Admin should add short description, product price, availability status of a product as well as image.	TC-02
PRM-NF-1.2	Product cannot be added without categories	TC-03
PRM-UR-1.1	Slug should be same as product name and must be added automatically	TC-04
PRM-F-2.0	System should allow admin to create a product category with short description	TC-05
PRM-F-3.0	System should allow admin to create a product variation such as 'blue-large shirt'	TC-06
PRM-UR-3.1	Variation category should be entered without value	TC-07
PRM-F-4.0	Admin should be able to remove cart items	TC-08

Testing Table for SRS of product management system

TC ID	NAME	SRS ID	STEPS	Dataset	Expected	Actual	Result
TC-01	Create product	PRM-F-1.0	Select Product in Admin panel and	Product Name: Goldstar Shoes Slug: goldstar-shoes	Create product windows		

			create a product	Description: asdfgh Price: 2000 Stock: 20 Is_available: Yes Category : shoe			
TC-02	Add details	PRM-NF-1.1	Fill the information in ‘Create product’	Product Name: Goldstar Shoes Slug: goldstar-shoes Description: asdfgh Price: 2000 Stock: 20 Is_available: Yes Category : shoe	Product added successfully		
TC-03	Add details without category	PRM-UR-1.1	Fill the information in ‘Create product’ expect product categories	Product Name: Goldstar Shoes Slug: goldstar-shoes Description: asdfgh Price: 2000 Stock: 20 Is_available: Yes Category : NULL	Field missing error		
TC-04	Product name equals	PRM-UR-1.1	Select Product in Admin	Product Name: Goldstar Shoes Slug: giant-shoes	Field error		

	slug Name		panel and create a product and try to add different slug name	Description: asdfgh Price: 2000 Stock: 20 Is_available: Yes Category : shoe			
TC-05	Add category	PRM-F-2.0	Select Categories in Admin panel and create a category	Category Name: shoes Slug: shoes Description: dfghj	Added category		
TC-06	Add variation	PRM-F-3.0	Select Variations in Admin panel and click on variations	Product: Goldstar shoe Variation_category: color Value: Blue	Added variation		
TC-07	Variation category	PRM-UR-3.1	Select Variations in Admin panel and click on variations then add values	Product: Goldstar shoe Variation_category: color Value: NULL	Field Invalid error		
TC-08	Remove Cart item	PRM-F-4.0	From admin panel click	Product: goldstar	Cart item removed		

			on 'cart' and select desired item to remove.				
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5.1.3. SRS table of payment System

Requirement Code	Requirement Specification	Testing ID
PS-F-1.0	User Must Fulfil all the details in billing address	TC-01
PS-UR-1.0	If user try to place order without filling billing address, it should not be redirected to next page	TC-02
PS-NF-1.1	User should be redirected to next page to review their order before payment for one last time	TC-03
PS-F-2.0	One should be registered to PayPal account to make payments	TC-04
PS-UR-2.1	Alert message should be shown after successful transaction	TC-05

Testing Table of payment system

TC ID	NAME	SRS ID	STEPS	Dataset	Expected	Actual	Result
TC -01	Billing Details add	PS-F-1.0	Click on checkout from cart and add	First Name: Nabin Last Name: Rayamajhi Email: nabinrmc5@gmail.com	user should be able to place order		

			billing details	Phone: 98031000579 City : Kathmandu			
TC-02	Billing Details adding criteria	PS-UR-1.0	Click on checkout from cart and then try to place-order without filling information	First Name: NULL Last Name: Rayamajhi Email: NULL Phone: 98031000579 City : Kathmandu	user should not be able to place order, it throws invalid field error		
TC-03	Review orders	PS-NF-1.1	Click on place-order after filling billing details	Billing address ()	Billing information being displayed		
TC-04	Registered to PayPal	PS-F-2.0	Click on payment in review order windows		User should not be able to proceed without having PayPal account		
TC-05	Transaction Alert	PS-UR-2.1	Fill your login credentials then		Funds must be transferred to merchant		

			proceed to pay		account and alert should be shown.		
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5.1.4. SRS table of Realtime chat

Requirement Code	Requirement Specification	Testing ID
RS -F- 1.0	User must be logged in	TC-01
RS – F-2.0	User should be able to send message	TC-02
RS -F-3.0	User should be able to delete message	TC-03
RS – F-4.0	User Should be able to rate message	TC-04

5.2. Wireframe

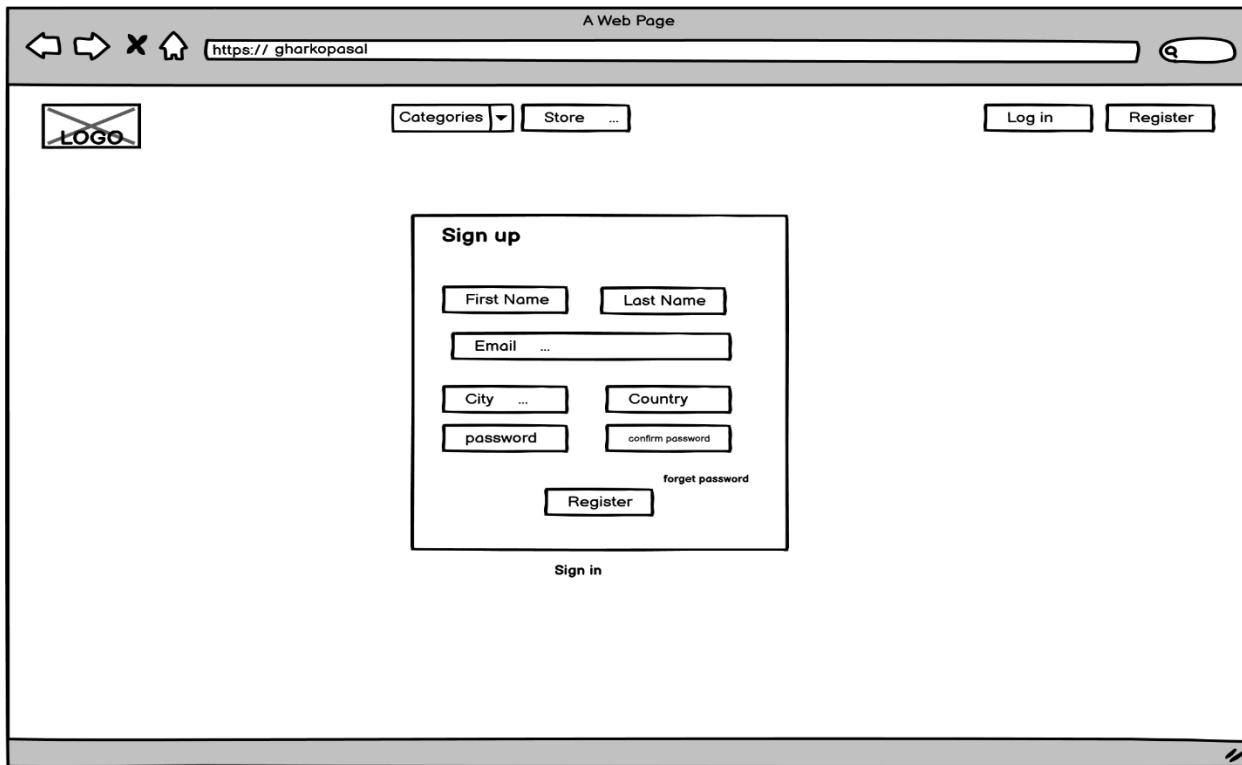


Figure 7: Wireframe of Register screen

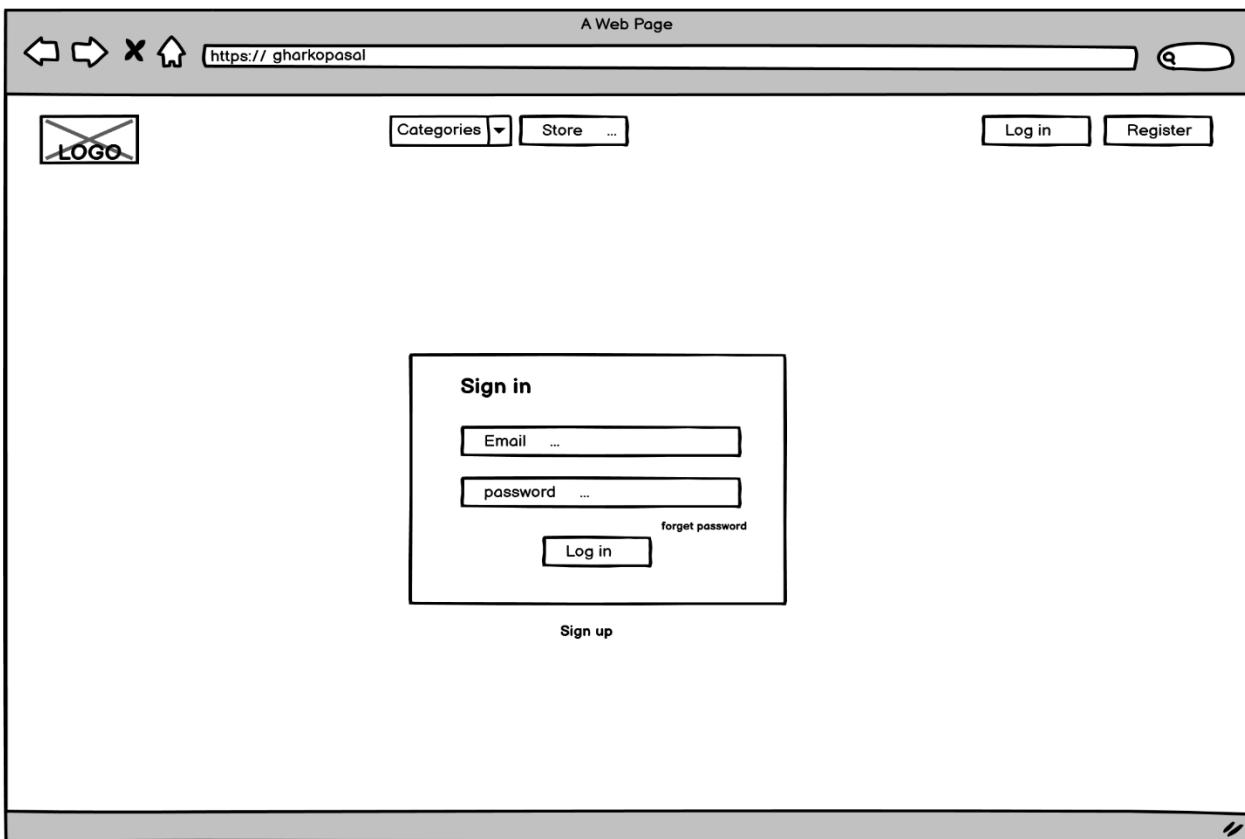


Figure 8: Wireframe of login screen

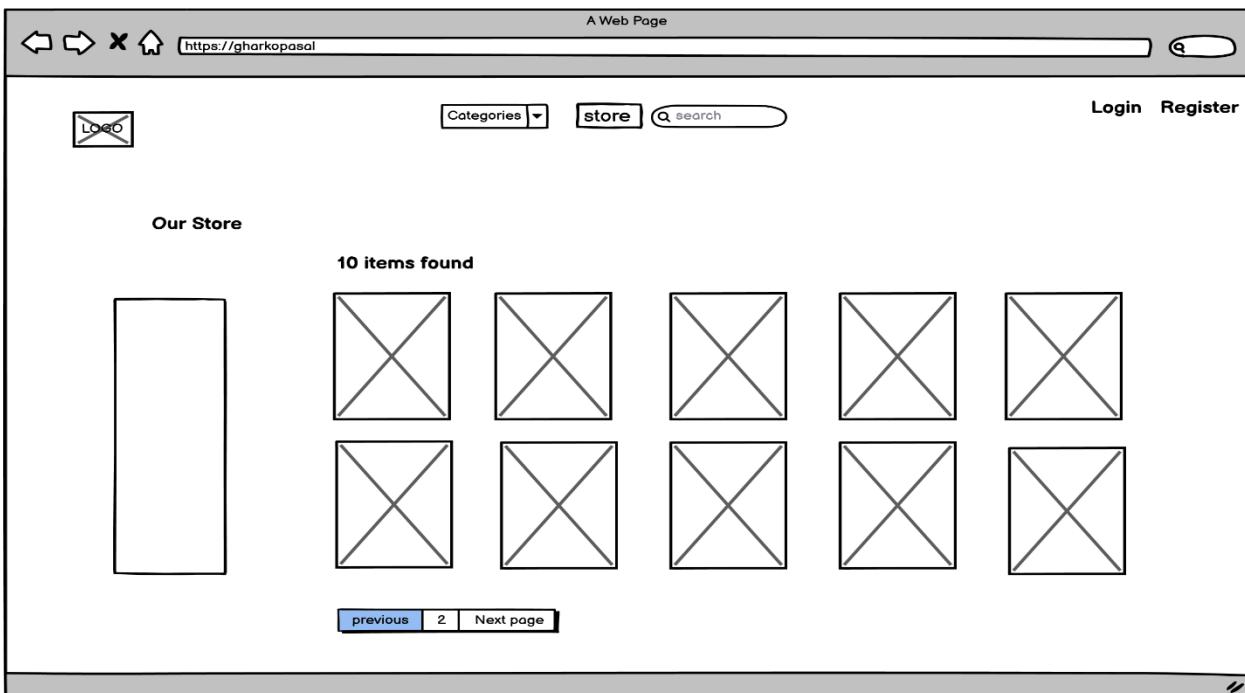


Figure 9: Wire frame of Store page before login

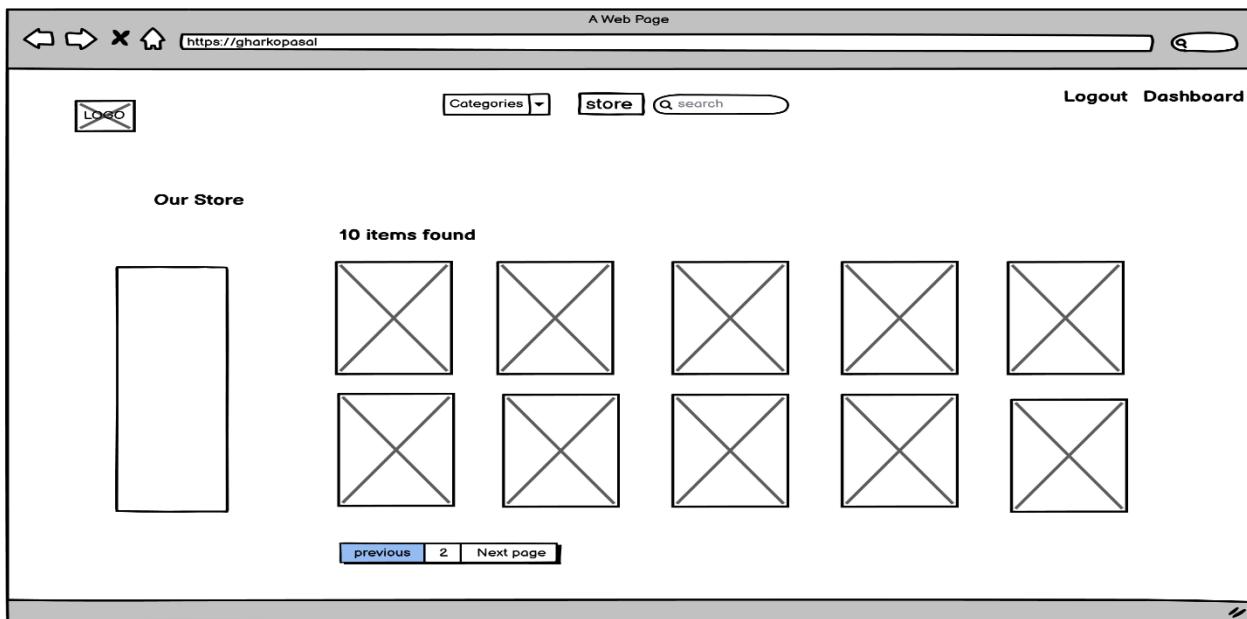


Figure 10: Wire frame of Store page after login

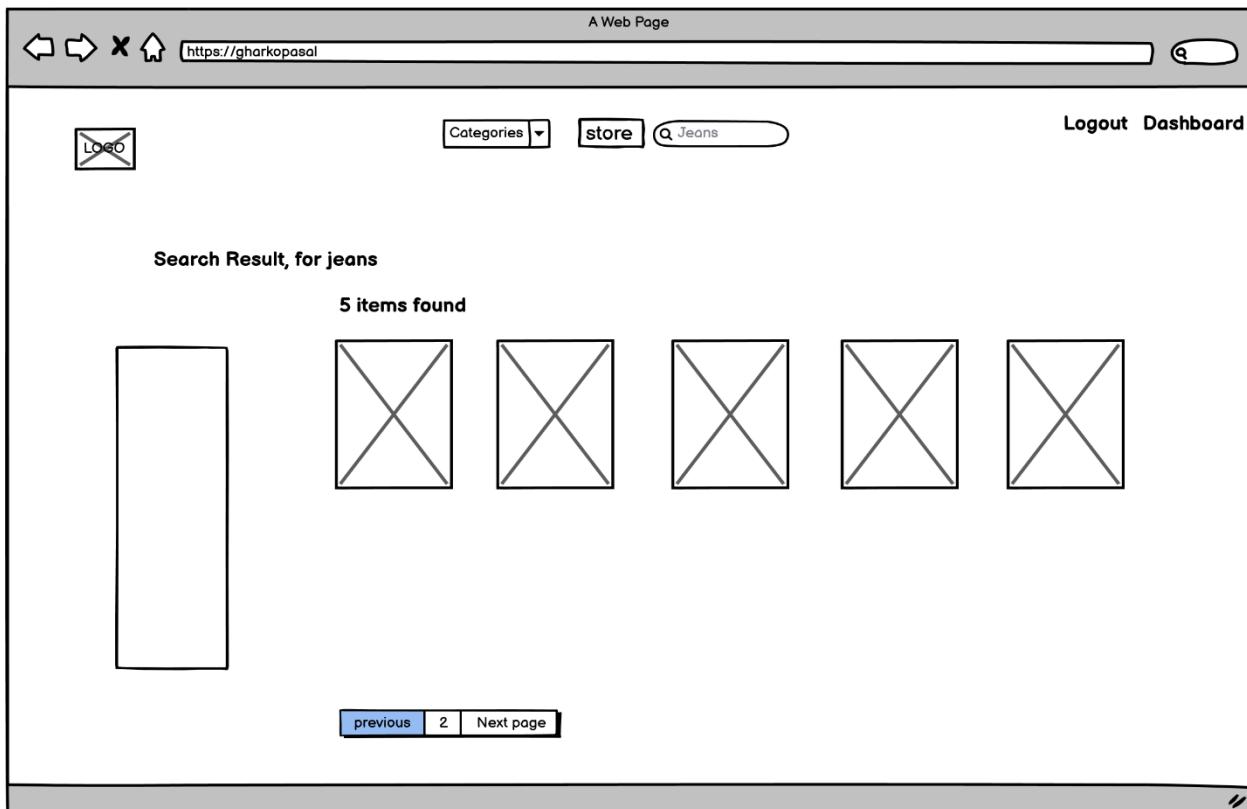


Figure 11: Wire frame of Search Result

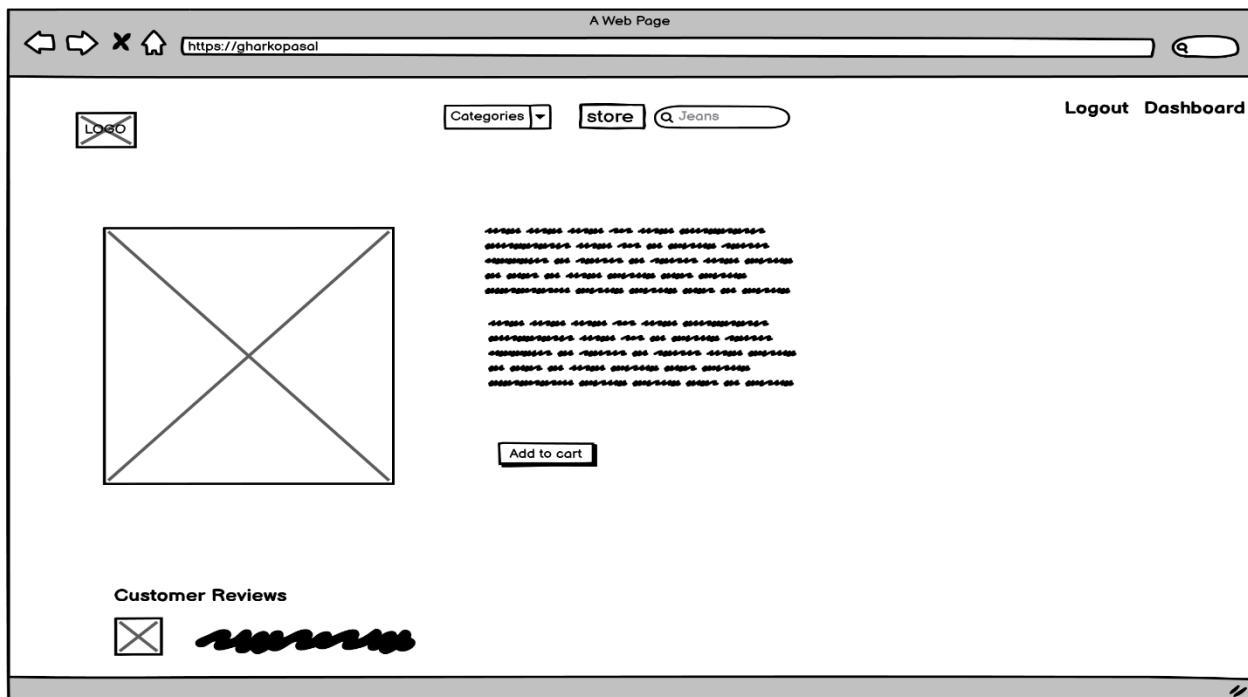


Figure 12: Wireframe of product detail

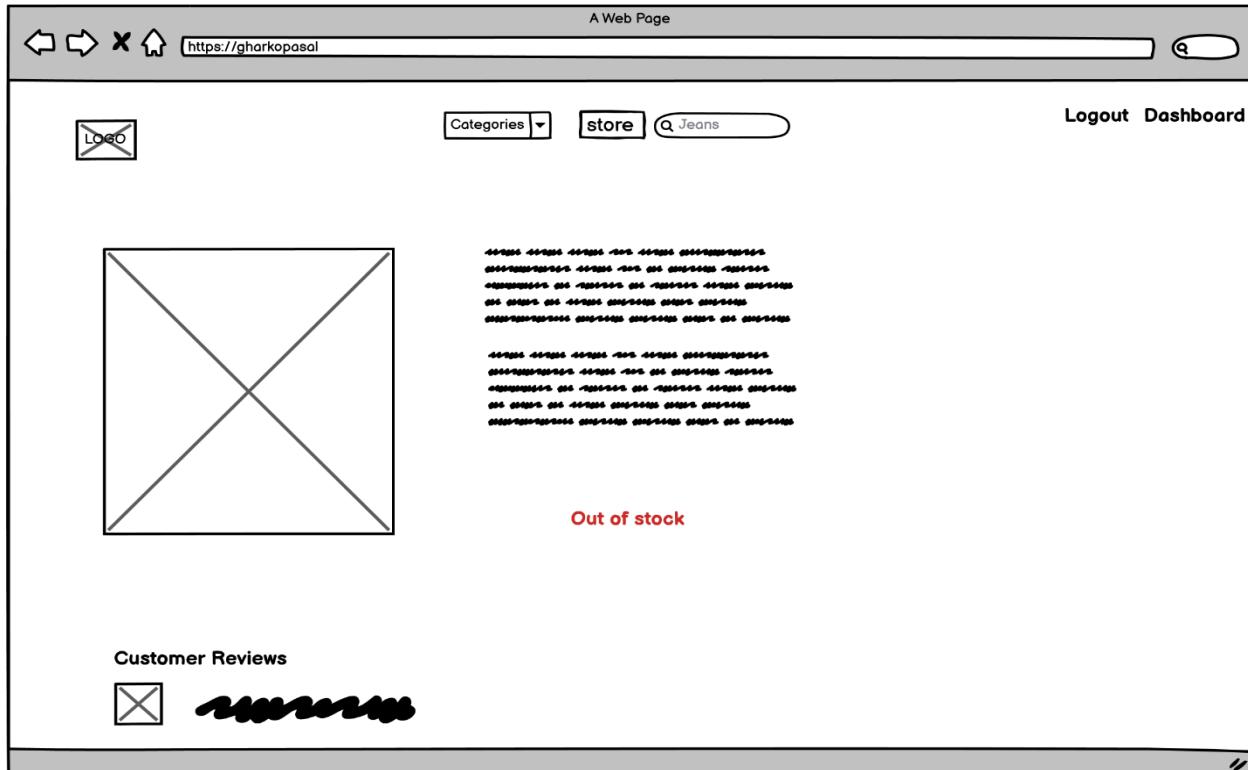


Figure 13: Wireframe of product detail page if item is out of stock

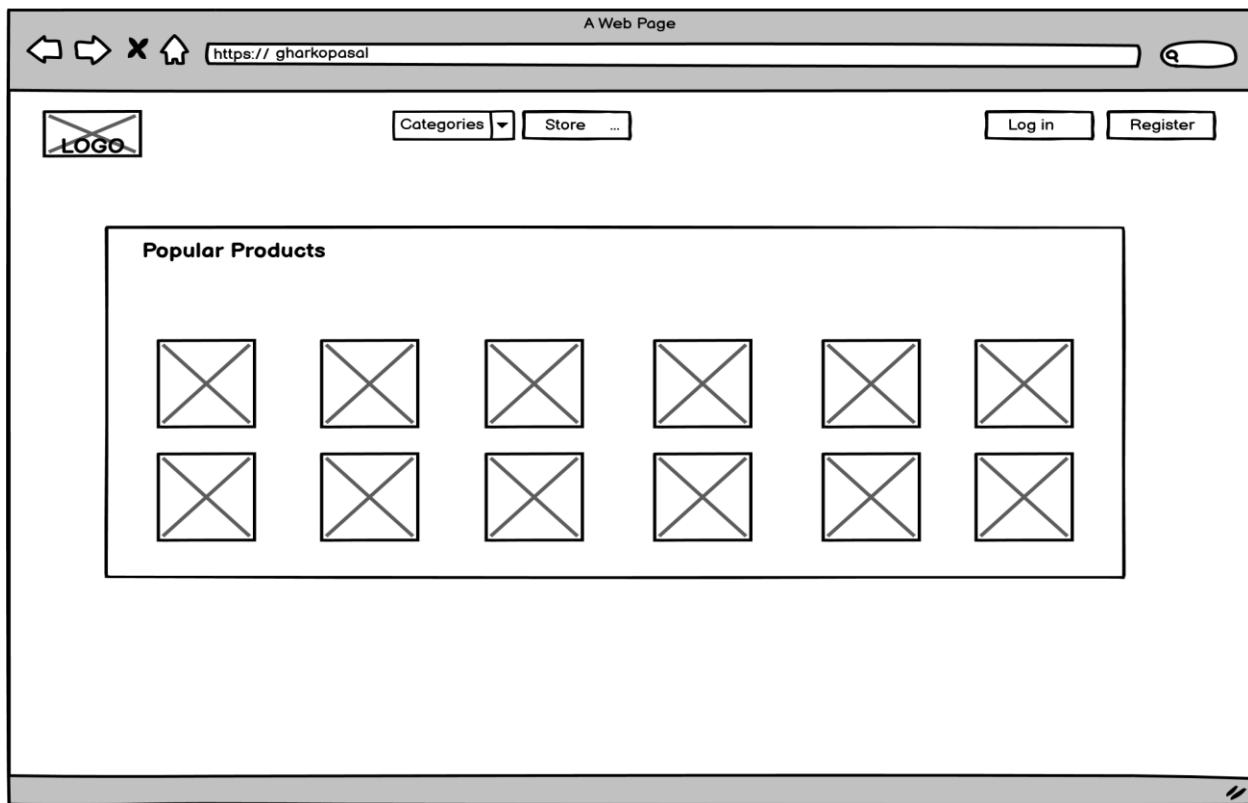


Figure 14: wireframe of recommended products

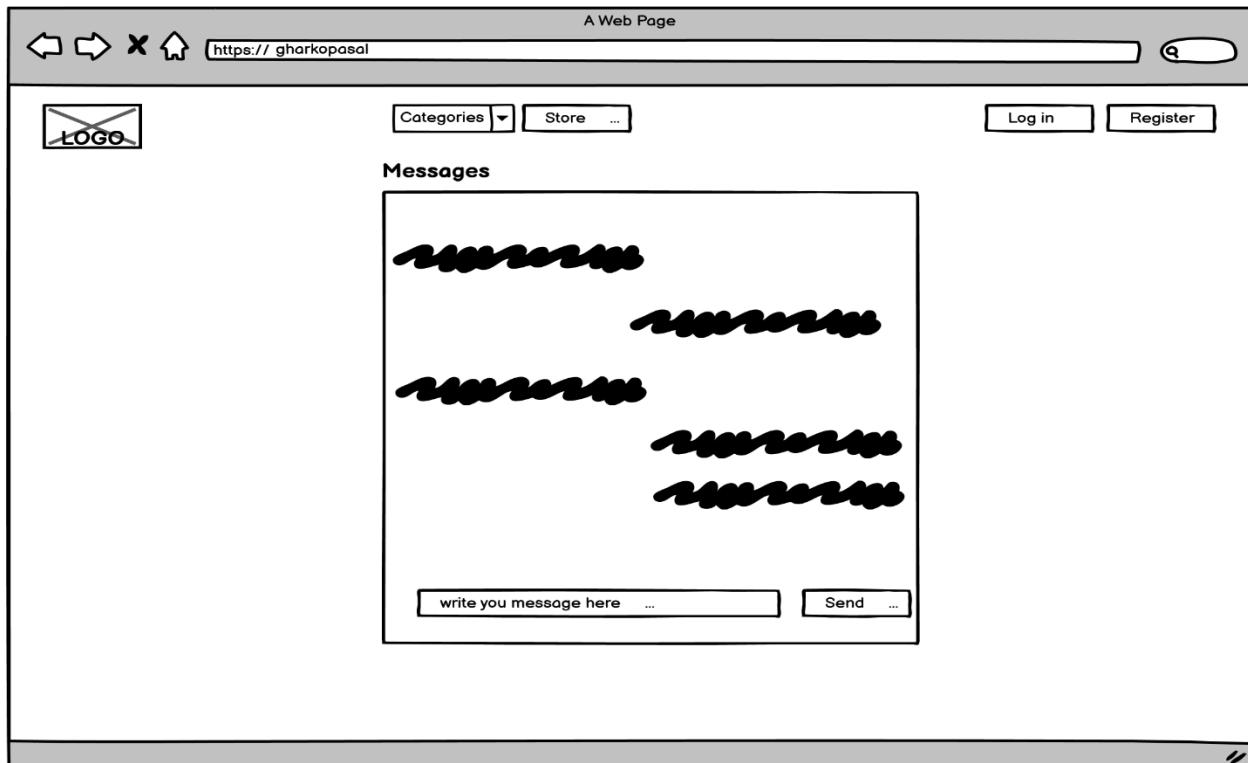


Figure 15: Wire frame of Realtime chat

5.3. Activity diagram

5.3.1. User management user and admin side diagram

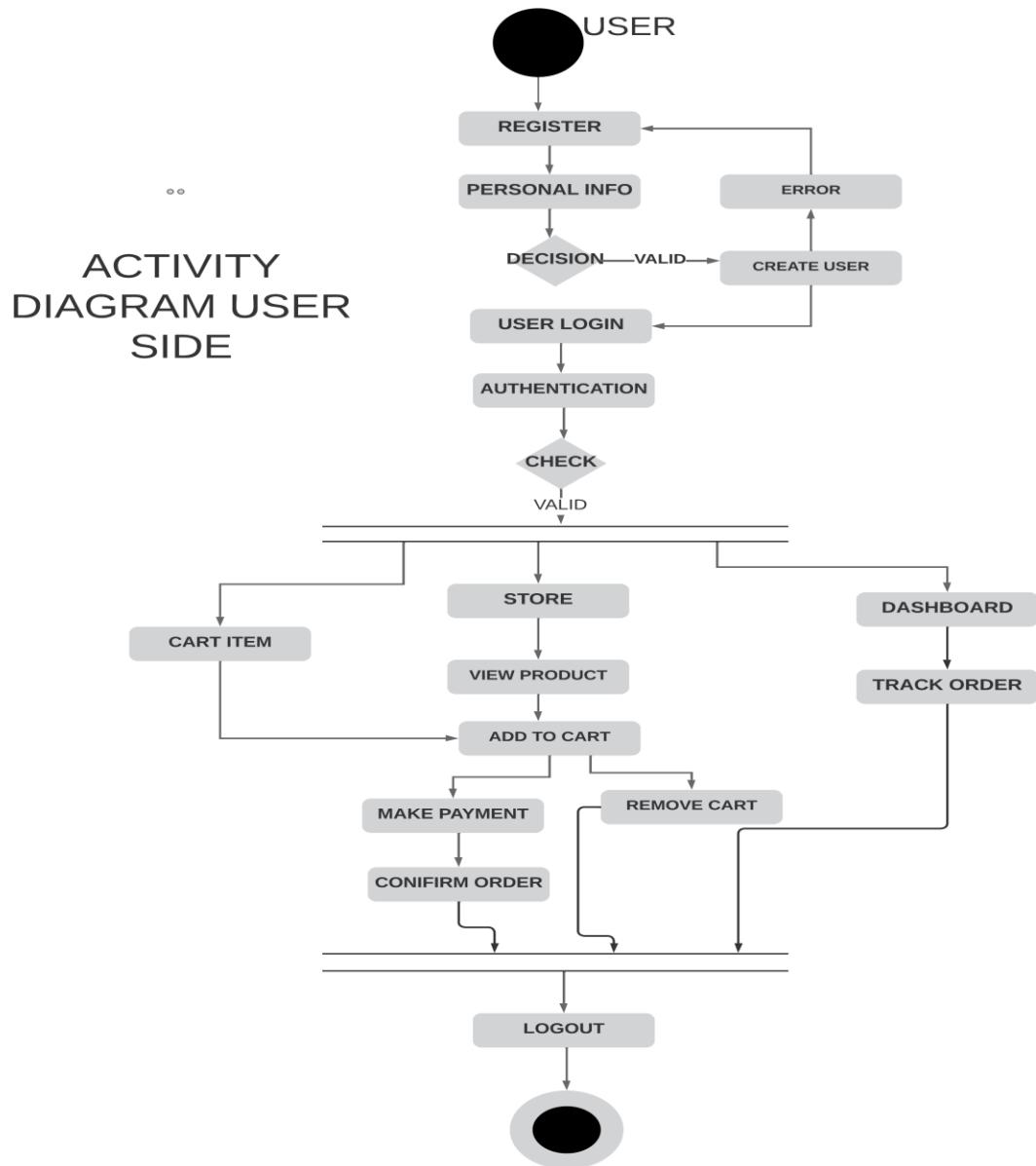


Figure 16:User management user side diagram

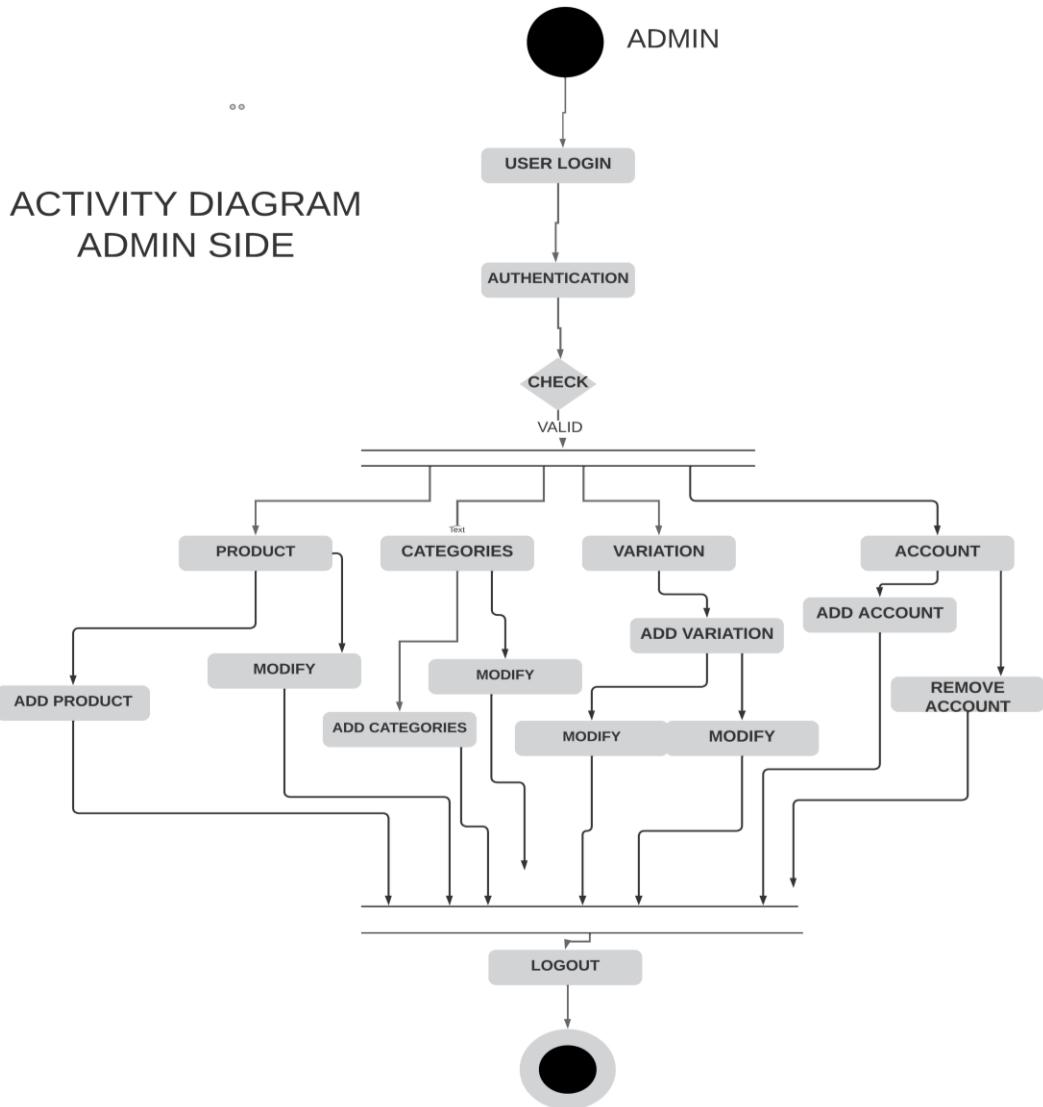


Figure 17: User management admin side diagram

5.3.2. Payment System

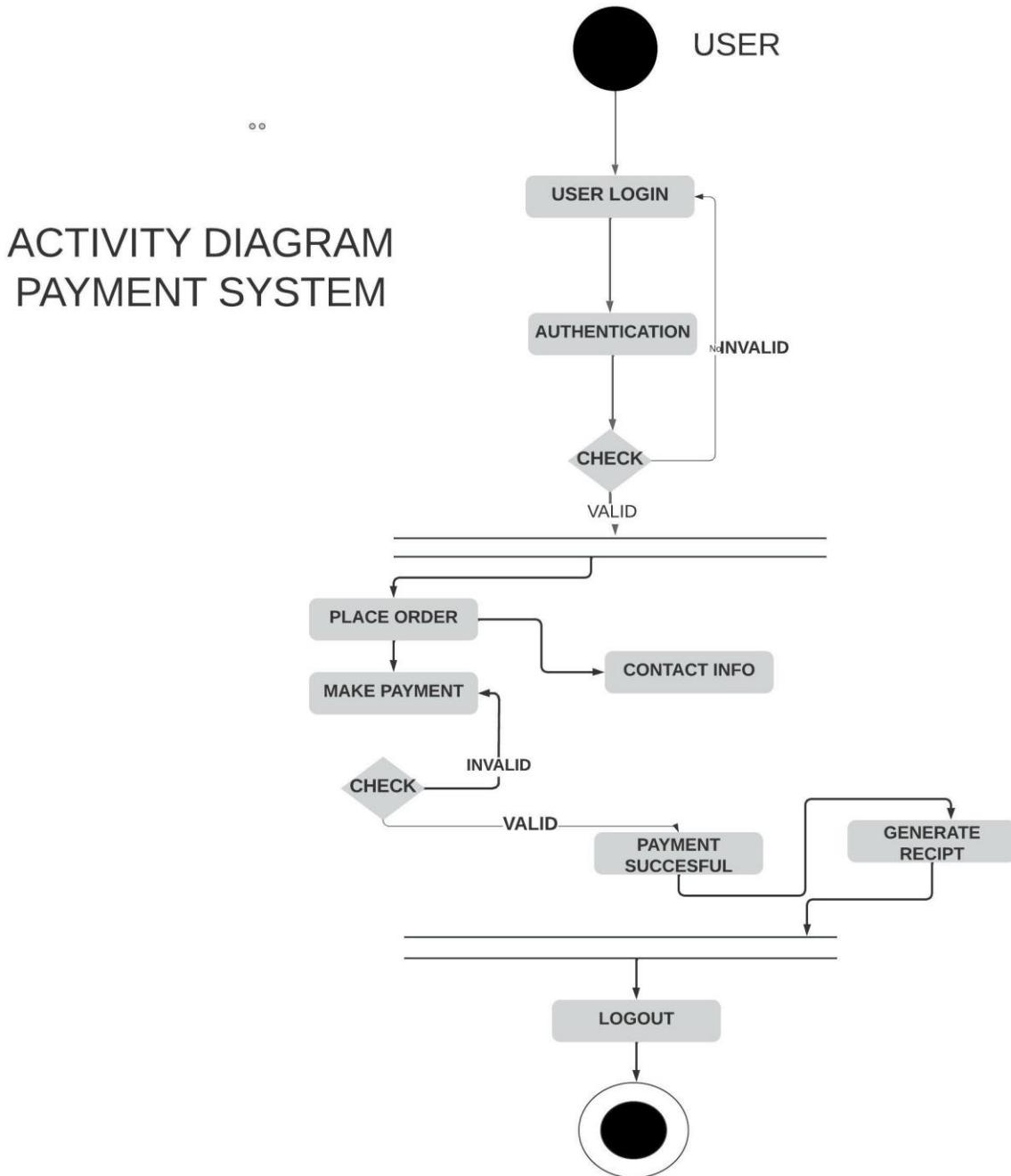


Figure 18: Payment System Activity Diagram

5.3.3. Realtime Chat

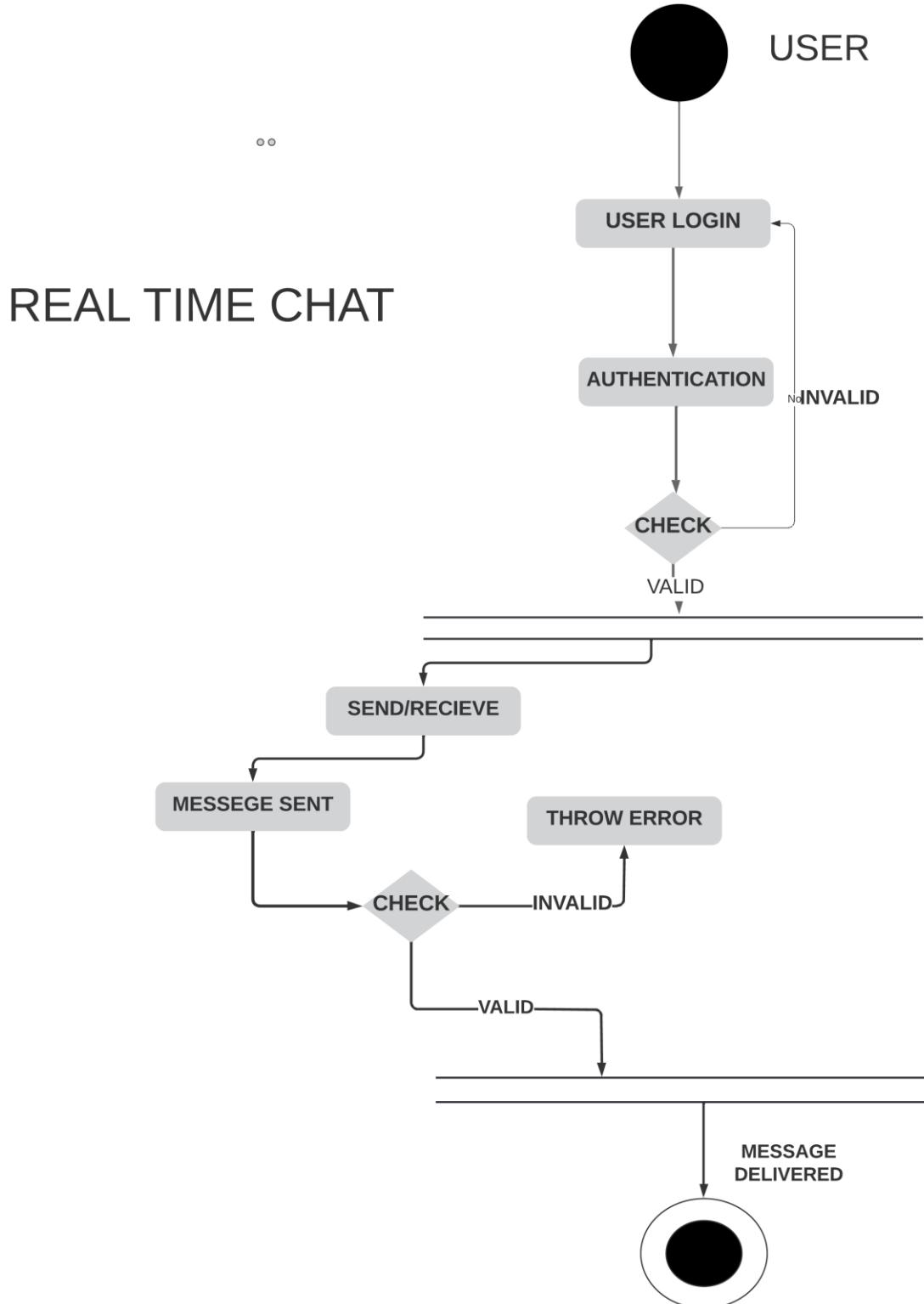


Figure 19: Realtime Chat

5.3.4. Recommended System

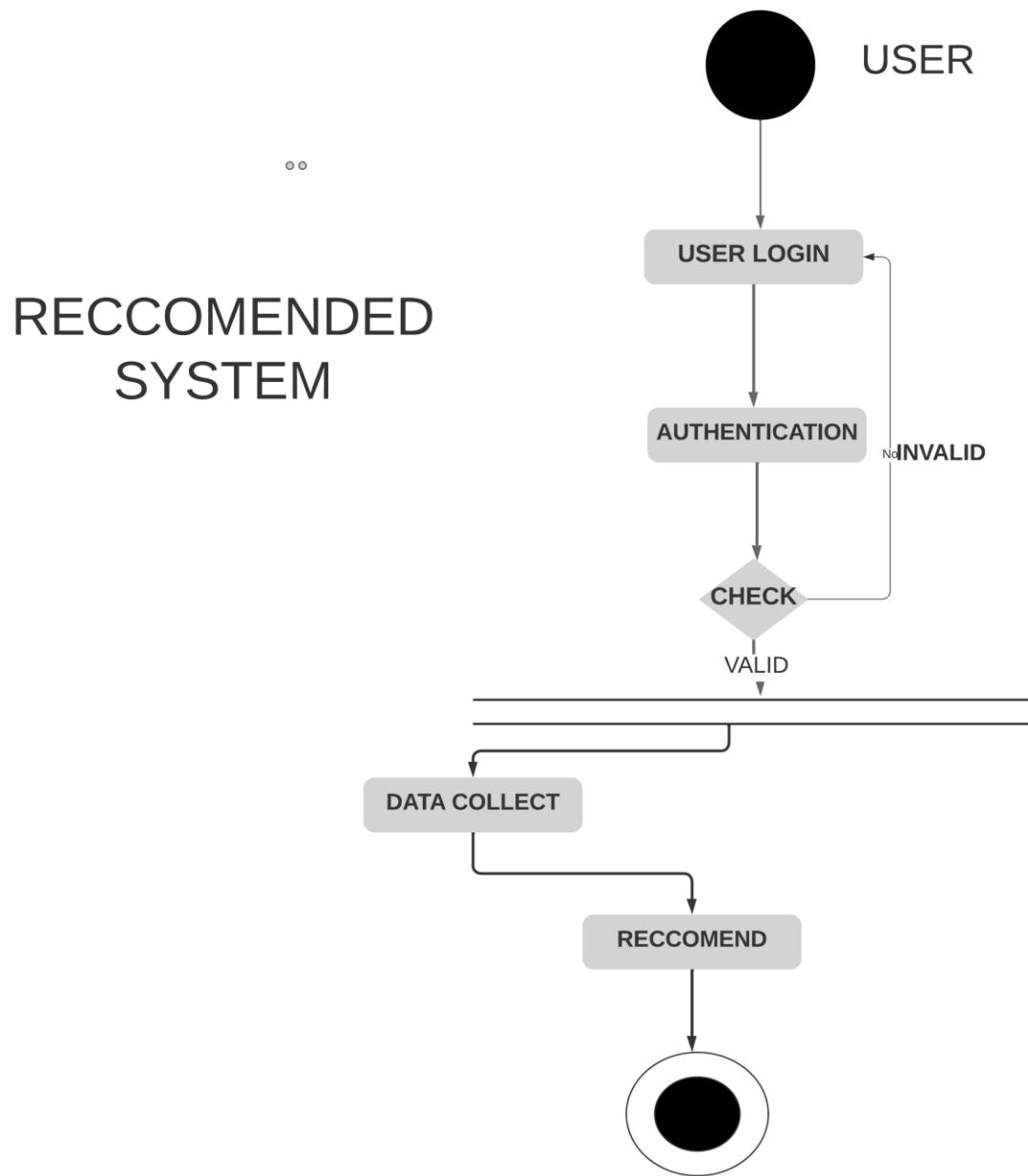
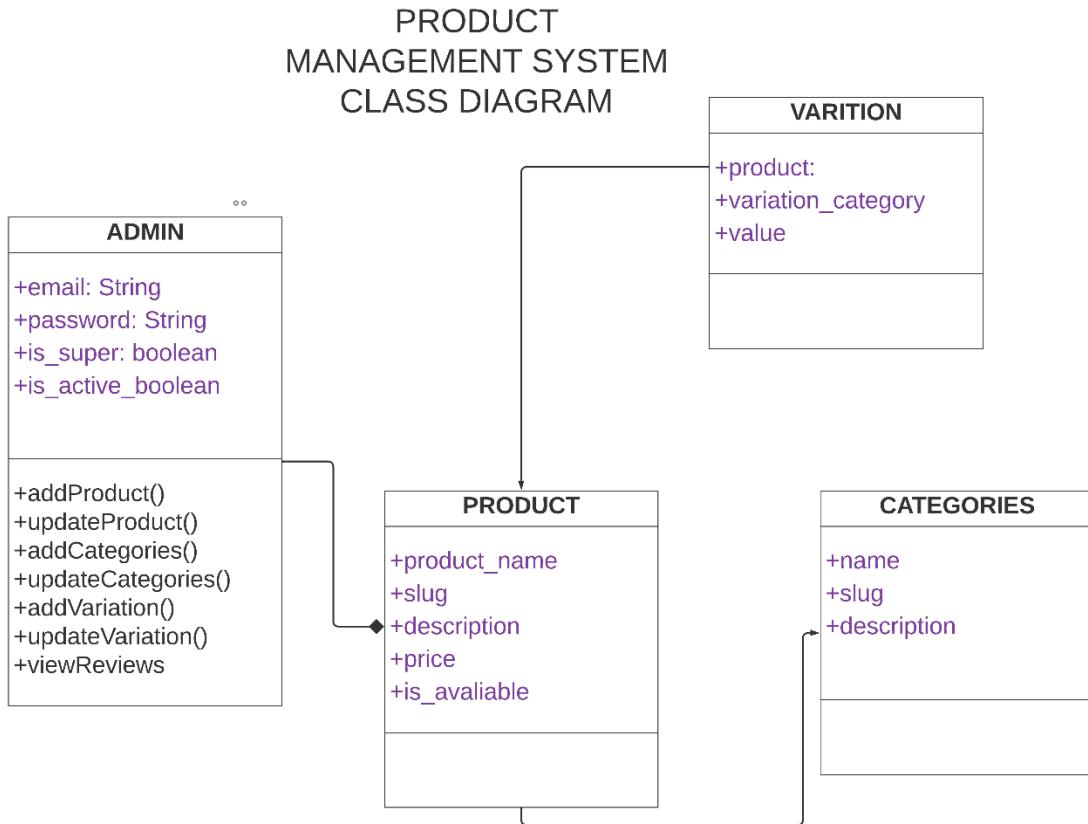


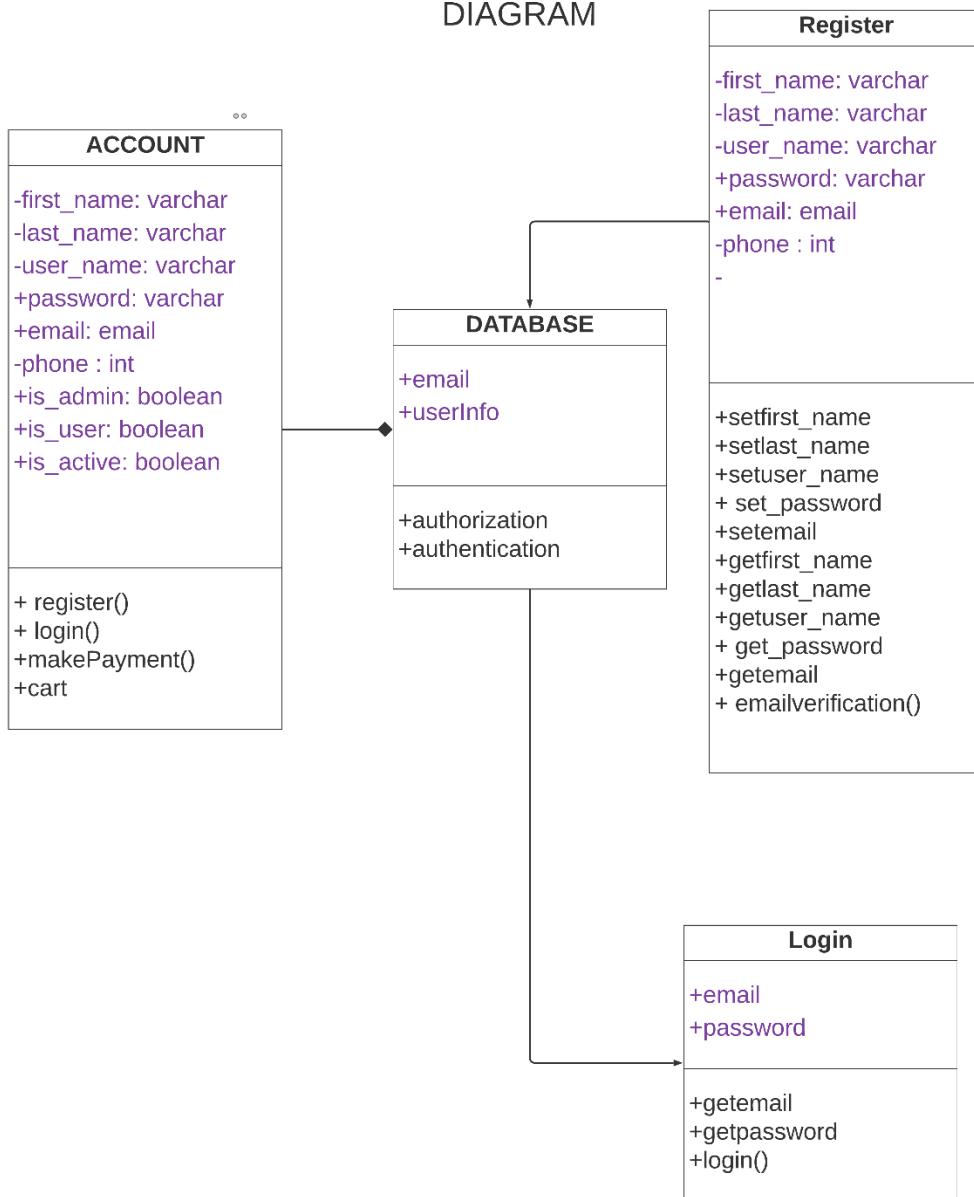
Figure 20: Recommended system

5.4. ERD Diagram

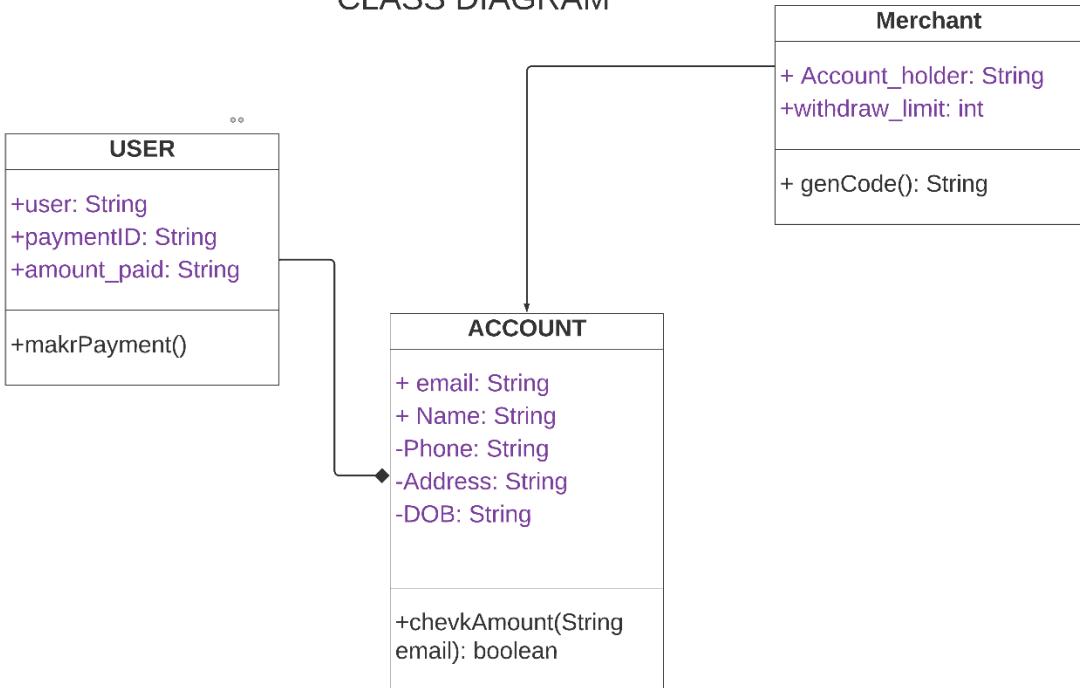
5.5. Class Diagram



**USER MANAGEMENT
SYSTEM CLASS
DIAGRAM**



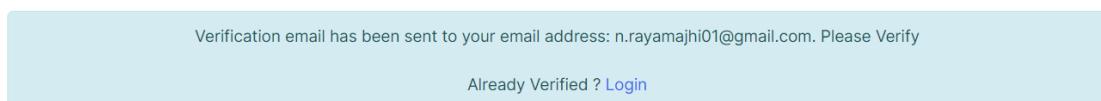
PAYMENT SYSTEM CLASS DIAGRAM



5.6. Testing

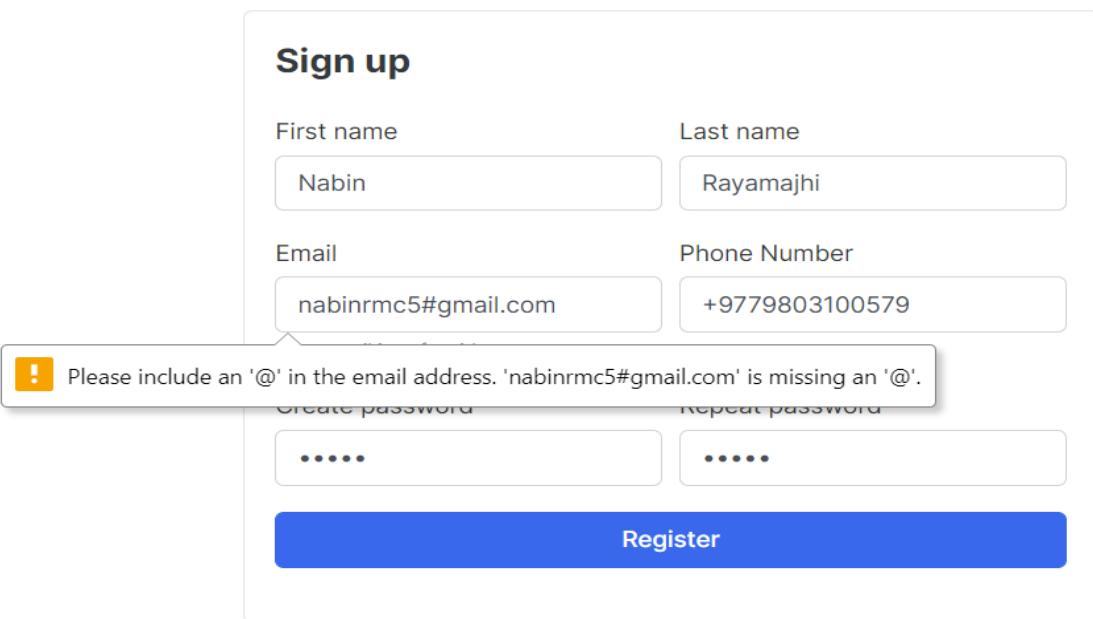
5.6.1. User Management System

TC-01



Here we can see result as expected, verification email has been sent

TC-02



A screenshot of a sign-up form titled "Sign up". The form fields are as follows:

- First name: Nabin
- Last name: Rayamajhi
- Email: nabinrmc5#gmail.com (highlighted with a red border)
- Phone Number: +9779803100579

A validation message is displayed in a red box below the email field: "Please include an '@' in the email address. 'nabinrmc5#gmail.com' is missing an '@'." Below the form are two password input fields labeled "Create password" and "Repeat password", both showing masked input. A large blue "Register" button is at the bottom.

Have an account? [Log In](#)

Result is as expected, it us showing in valid email as a message

TC-03

Create password Repeat password

Register

• Password does not match !

Here we can see ‘password does not match’ error because there were two different passwords as mentioned in TC-03

TC-04

Sign up

First name Last name

Email Phone Number

Your email is safe with us.

Create password Repeat password

Register

• Account with this Email already exists.

As mentioned in TC-04 when email is already registered in a database it throws such exceptions

TC-05: Email Verification



nabinrmc5@gmail.com

to me ▾

<!-- rendering html protection against crossite scriptiing-->

Hi Nabin,

Click on below link to confirm your registration.

<http://127.0.0.1:8000/accounts/activate/MjE/b4kasa-0d738d2be3b5a3dd6d6be3f4203d3aeb/>

Nabin Rayamajhi

TC-06: Alert if all the field left empty in Register Page

Sign up

First name Last name

Enter your First Name Enter your Last Name

Email ! Please fill out this field. Phone Number

Enter your Email Enter your Phone Number

Your email is safe with us.

Create password Repeat password

Enter Password Confirm Password

Register

TC-08: Deleting user account

Action: [Delete selected accounts](#) [Go](#) 1 of 2 selected

<input type="checkbox"/>	EMAIL	FIRST NAME
<input checked="" type="checkbox"/>	n.rayamajhi01@gmail.com	Nabin
<input type="checkbox"/>	nabinrmc5@gmail.com	Nabin

Are you sure?

Are you sure you want to delete the selected acc

Summary

- Accounts: 1

Objects

- Account: n.rayamajhi01@gmail.com

[Yes, I'm sure](#)

[No, take me back](#)

Successfully deleted 1 account.

Select account to change



Action:



EMAIL



nabinrmc5@gmail.com



TC-09: Ban user

Change account

Password: **algorit**

Raw pas

First name: **Nabir**

Last name: **Rayar**

Username: **n.raya**

Email: **n.raya**

Phone: **+977**

Is admin

Is staff

Is active

Is superadmin

5.6.2. Product Management System:

TC-01: Add product Window

Add product

Product name:

Slug:

Description:

Price:

Image: No file chosen

Stock:

Is available

Category:  

TC-02: Add product

 The product "Goldstar Shoes2" was added successfully.

TC- 03: Trying to add product without category

This field is required.

Category:  

TC-04: slugs should be equal to name otherwise throws error

Please correct the errors below.

Product name:

Slug:

TC-05: Creating a category

Add category

Category name:

Slug:

Description:

Cat image: Screenshot (9).png

 The category “nabin” was added successfully.

TC-06: Adding product variation

Add variation

Product: Goldstar Shoes   

Variation category: color 

Variation value: yellow

Is active

Save and add another Save and continue editing SAVE

 The variation "yellow" was added successfully.

TC-08: Remove Cart Item

[View cart items to change](#)

Action: Delete selected cart items  Go 2 of 5

<input type="checkbox"/> PRODUCT	CART
<input type="checkbox"/> payment	-
<input checked="" type="checkbox"/> Goldstar Shoes	ovo9tc9i
<input checked="" type="checkbox"/> Goldstar Shoes	v1f71am
<input type="checkbox"/> Goldstar Shoes	zfdw7t2
<input type="checkbox"/> Goldstar Shoes	i85p6qjb

5 cart items

 Successfully deleted 2 cart items.

5.3. Payment System

TC-01: Add billing Details: user should be able to place order

The screenshot shows a shopping cart interface. At the top, there is a header with the text "घरको पसल" (Home Goods) in blue, followed by "All category", "Store", a search bar with a magnifying glass icon, and a user welcome message "Welcome Nabin" with links to "Dashboard" and "Logout". To the right is a shopping cart icon with a red notification badge.

Billing Address

First Name Nabin	Last Name Rayamajhi
Email nabinrmc5@gmail.com	Phone Number +9779803100579
Address Line 1: Dillibazar, Kathmandu	Address Line 2:
City Kathmandu	Provience Bagmati

Order Note
asd

PRODUCT

PRODUCT	QUANTITY	PRICE
payment Color : Blue Size : Small	2	Rs 2 Rs 1 each

Place Order

Continue Shopping

The screenshot shows the user's billing address details. The address is listed as follows:

Name: NabinRayamajhi
Address: Dillibazar, Kathmandu
Contact Number: +9779803100579
Email: nabinrmc5@gmail.com
Order Note: asd

TC-02: User must not be able to proceed without adding billing address

The screenshot shows a two-column form. The left column is labeled "Billing Address" and contains fields for First Name, Last Name, Email (which has a red border and a tooltip "Please fill in this field."), and Phone Number. The right column displays a product summary: a brown jacket labeled "payment", quantity 2, price "Rs 2" (with a note "Rs 1 each"), and a "Place Order" button.

TC 03: Display billing information

The screenshot shows a "Billing Address" section with the following details:
Name: NabinRayamajhi
Address: Dillibazar, Kathmandu
Contact Number: +9779803100579
Email: nabinrmc5@gmail.com
Order Note: asd

TC-04: Ask for login info

The screenshot shows a PayPal login page with the URL "sandbox.paypal.com/checkoutnow?sessionID=uid_b1a635586b_mtc6nt...". It features the PayPal logo and the text "Pay with PayPal". Below it, there is a placeholder "Enter your email or mobile number to get started." and a text input field. A blue "Next" button is positioned below the input field. At the bottom, there is a link "Pay with a Bank Account or Credit Card".

5.7.Database

db Table name: accounts_account WITHOUT ROWID

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	🔑				🟡			NULL
2	password	varchar (128)					🟡			NULL
3	first_name	varchar (50)					🟡			NULL
4	last_name	varchar (50)					🟡			NULL
5	username	varchar (50)		✳️			🟡			NULL
6	email	varchar (100)		✳️			🟡			NULL
7	phone	varchar (50)					🟡			NULL
8	date_joined	datetime					🟡			NULL
9	last_login	datetime					🟡			NULL
10	is_admin	bool					🟡			NULL
11	is_staff	bool					🟡			NULL
12	is_active	bool					🟡			NULL
13	is_superuser	bool					🟡			NULL

Figure 21: Dataset of Accounts

db Table name: auth_group WITHOUT ROWID

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	🔑				🔴			NULL
2	name	varchar (150)			✳️		🔴			NULL

Figure 22: Dataset for auth_group

auth_group_permissions (db)

Structure Data Constraints Indexes Triggers DDL

db Table name: auth_group_permissions WITHOUT ROWID

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	🔑				🟡			NULL
2	group_id	integer		✳️			🟡			NULL
3	permission_id	integer		✳️			🟡			NULL

Figure 23:Dataset for permission

auth_permission (db)

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	key				no			NULL
2	content_type_id	integer		key			no			NULL
3	codename	varchar (100)					no			NULL
4	name	varchar (255)					no			NULL

carts_cart (db)

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	key				no			NULL
2	cart_id	varchar (250)					no			NULL
3	date_added	date					no			NULL

Figure 24: Dataset for cart

carts_cartitem (db)

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	key				no			NULL
2	quantity	integer					no			NULL
3	is_active	bool					no			NULL
4	product_id	integer		key			no			NULL
5	user_id	integer		key						NULL
6	cart_id	integer		key						NULL

Figure 25: Dataset for cart_items

Figure 26 shows the structure of the `carts_cartitem_variations` table. The table has three columns: `id`, `cartitem_id`, and `variation_id`. All columns are of type `integer`. The `id` column is defined as the primary key.

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated		Default value
1	<code>id</code>	<code>integer</code>	🔑				🚫				<code>NULL</code>
2	<code>cartitem_id</code>	<code>integer</code>		📝			🚫				<code>NULL</code>
3	<code>variation_id</code>	<code>integer</code>		📝			🚫				<code>NULL</code>

Figure 26: Dataset for Cart item variation

Figure 27 shows the structure of the `category_category` table. The table has five columns: `id`, `category_name`, `description`, `cat_image`, and `slug`. The `id` column is defined as the primary key. The `category_name` column is of type `varchar(50)`. The `cat_image` column is of type `varchar(100)`.

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated		Default value
1	<code>id</code>	<code>integer</code>	🔑				🚫				<code>NULL</code>
2	<code>category_name</code>	<code>varchar(50)</code>		📝			🚫				<code>NULL</code>
3	<code>description</code>	<code>text</code>					🚫				<code>NULL</code>
4	<code>cat_image</code>	<code>varchar(100)</code>					🚫				<code>NULL</code>
5	<code>slug</code>	<code>varchar(100)</code>		📝			🚫				<code>NULL</code>

Figure 27: Dataset for category

orders_order (db)

Structure Data Constraints Indexes Triggers DDL

db Table name: orders_order WITHOUT ROWID

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	key							NULL
2	order_number	varchar (100)								NULL
3	first_name	varchar (100)								NULL
4	last_name	varchar (100)								NULL
5	phone	varchar (100)								NULL
6	email	varchar (100)								NULL
7	address1	varchar (100)								NULL
8	address2	varchar (100)								NULL
9	state	varchar (100)								NULL
10	city	varchar (100)								NULL
11	order_note	varchar (100)								NULL
12	order_total	real								NULL
13	ip	varchar (20)								NULL
14	is_ordered	bool								NULL
15	created_at	datetime								NULL
16	updated_at	datetime								NULL
17	payment_id	integer								NULL
18	user_id	integer								NULL
19	status	varchar (10)								NULL

Figure 28: Dataset for orders

orders_orderproduct (db)

Structure Data Constraints Indexes Triggers DDL

db Table name: orders_orderproduct WITHOUT ROWID

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	key							NULL
2	color	varchar (50)								NULL
3	size	varchar (50)								NULL
4	quantity	integer								NULL
5	product_price	real								NULL
6	ordered	bool								NULL
7	created_at	datetime								NULL
8	updated_at	datetime								NULL
9	order_id	integer								NULL
10	payment_id	integer								NULL
11	product_id	integer								NULL
12	user_id	integer								NULL
13	variation_id	integer								NULL

Figure 29: dataset of ordered products

orders_payment (db)

Structure Data Constraints Indexes Triggers DDL

Table name: orders_payment WITHOUT ROWID

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	key				?			NULL
2	payment_id	varchar (100)					?			NULL
3	payment_method	varchar (100)					?			NULL
4	amount_paid	varchar (100)					?			NULL
5	status	varchar (100)					?			NULL
6	created_at	datetime					?			NULL
7	user_id	integer		table			?			NULL

Figure 30: dataset of payments

store_product (db)

Structure Data Constraints Indexes Triggers DDL

Table name: store_product WITHOUT ROWID

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	key				?			NULL
2	product_name	varchar (200)			cube		?			NULL
3	slug	varchar (200)			cube		?			NULL
4	description	text					?			NULL
5	price	integer					?			NULL
6	image	varchar (100)					?			NULL
7	stock	integer					?			NULL
8	is_available	bool					?			NULL
9	created_date	datetime					?			NULL
10	modified_date	datetime					?			NULL
11	category_id	integer		table			?			NULL

Figure 31: Dataset for store products

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	Default value
1	id	integer	🔑				🚫			NULL
2	variation_category	varchar (100)					🚫			NULL
3	variation_value	varchar (100)					🚫			NULL
4	is_active	bool					🚫			NULL
5	created_date	datetime					🚫			NULL
6	product_id	integer	🔢				🚫			NULL

Figure 32: Dataset for variations

6. Solutions to academic questions

- Is there any e-commerce in Nepal targeted toward local brands?

It was found that there are some popular e-commerce sites in Nepal such as Daraz, Sastodeal, Thuparai, Itti Nepal which are being used to sell products. Most of them are found to be a retail store. These businesses do include local brands but are overshadowed by international brands. Lack of reliability seems major downfall. It can be concluded that there is e-commerce in Nepal that sell local brands but there is not specific site that only target local brands.

- Does any e-commerce in Nepal check quality of an item and operates only with verified merchant?

One of the major reasons of Nepali brands not getting market was found to be either they are too expensive, or they lack reliability and are not long-lasting. It was found that there are not any specific quality check criteria on any products. Merchants are also not verified; some sites were found to give permission to sell based on simple permanent account number (PAN) and some basic information without any specific background check. After reading few comments on their site it was also found that they were delivering wrong product. Some were even found to be selling damaged items

- How imported items are affecting country economy?

In a country like Nepal if a ratio of import is higher than export, it is believed that importing more products and services causes more harm than good to a economy. Country's own products were found to be thrown on a waste due to lack of market whereas as foreign items were being sold on a higher rate and gaining enough market. It was found that country imports goods that are expensive to produce in a home country, it was also found that even though goods from hilly areas like carpets, fruits and vegetables are way cheaper but due to lack of transportation they are being overshadowed (Tribhuvan University Central Library., 2021)

(**Note:** some statements are based on personal research on real time. Any Specific article or magazine were not found to disown the mentioned statement in solution)

7. Conclusion

Although there were several unforeseen barriers throughout the duration of development cycle. A final product was made ready to use. With a help of SCRUM methodologies development cycle was initiated and finalized product was ready for a demonstration. As the main aim of this case study was to promote homemade and Local products, a platform is being successfully developed which has potential to present those items in front of huge global audience. A system is focused on providing authentic and genuine product by selling genuine and authentic product from authentic merchants, an online store where item can be shipped directly from manufacturer without any need of physical store. In a developing country like Nepal, it was discovered that e-commerce can be useful for a people living in a rural area as they can freely sell their homemade products without a need of migrating to cities. But main obstacle was found to be low income and higher price of technology. Majority of populations were seeming to be lacking trust in ecommerce and were deeply rooted in conventional ways.

8. Critical Evaluations

Presented project was developed as a final year project of Herald College Kathmandu before a graduation. Gharko Pasal is an ecommerce website developed with initial purpose of providing

exposure to homemade products and only product manufactured in Nepal are sold in this site. Think Globally, Act Locally”, a popular slogan introduced by British scientist, planner and conservationist, Patrick Geddes (Groom, 2019) was the motivation behind this project. The systems hidden agenda was to improve economic status of a country, by encouraging people to be self-dependent and self-sufficient. It was found that customers want each thing in one place because of their limited time. As the use of smart phones increased, popularity of e-commerce as well was also increased simultaneously. Later availability of cheaper smart phones gave them more fame. Lack of Education and IT infrastructure, low-income groups, expensive internet, and total negligence were found to be major barriers to a prosperity of ecommerce in a developing country like Nepal. Most of the developing country's IT infrastructure was found to be either insufficient or non-existent. Numerous regions seem to exist with no internet access and others where 3G internet service is still available as the world transitions to 5G. According to a data publish by world bank, most of the developing countries were found to be low-income countries with an average annual income less than USD 1026 and cost of internet was mentioned to be \$29/month - \$300/ month which makes majority populations to access internet-based services extremely difficult.

Unfortunately, product is not as stated as in proposal, it lacks recommended system. Due to lack of data and also my knowledge in supervised learning of which I was unable to implement it on a system. But it has extra useful features like email verification before user registration, it also supports search product functionality. During the process I came to realize more than one payment gateway integration would have been better which can be implemented on future.

With a help of scrum methodology, project was completed in an iterative manner and was divided into milestone. It not only helped me to complete project on time but also introduced me to real life working mechanism of software development and has helped me to become industry ready. It taught me the importance of continuity. I took reference from various reports, articles, journals, books, newspapers, web pages etc. to enhance my knowledge about the case study, it helped me to be aware of not only the barriers in system development and artifacts but also several real barriers in people life and motivated me to work much harder to make positive changes in their life. During this period, I also got handy with many technological tools such as GitHub, Visual Studio Code, Figma and was able to enhance my programming knowledge in python, mainly its framework Django. I also got more used to bootstrap. During the process I also got aware with an

importance of diagram in SDLC such as Activity diagrams, Class Diagram, ERD diagram and SRS table etc. of which I was completely unknown of. There were also some technical miscalculations in my proposal about some artifacts, I had stated to use E-sewa as my payment gateway, but later E-Sewa rejected to provide an API, from this I learned the importance of having alternatives.

9. Evidence of project Managements

Log sheets

Faculty of Science and Engineering School of Mathematics and Computer Science		UNIVERSITY OF WOLVERHAMPTON	
PROJECT MANAGEMENT LOG			
First Name:	Nabin	Surname:	Majhi
Student Number:	2051896	Supervisor:	Sachit Tandukar
Project Title:	PCharko Pasal	Month:	NOV
What have you done since the last meeting			
<ul style="list-style-type: none">Submitted finalized proposalSubmitted PRF Form			
What do you aim to complete before the next meeting			
<ul style="list-style-type: none">Research and complete certain part of Literature Review (at least 1 research paper)Create private github Repositories for version control			
Supervisor comments			
<ul style="list-style-type: none">FDD Diagram is must			

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

Student Signature: gpt

Date: 21/11/2021

Supervisor Signature: JGK

Date: 21/11/2021

PROJECT MANAGEMENT LOG			
First Name:	Nabin	Surname :	Maghi
Student Number:	2051896	Supervisor:	Sachit Tandukar
Project Title:	Ghar ka pasal	Month:	Dec
What have you done since the last meeting			
Completed Literature review			
Initial development and design of website			
What do you aim to complete before the next meeting			
Front end design proceed on artifacts			
Supervisor comments			

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

Student Signature: 

Date: 19th Dec

Supervisor Signature: 

Date: 19th Dec

PROJECT MANAGEMENT LOG			
First Name:	Nabin	Surname :	Mayhi
Student Number:	2051896	Supervisor:	Sachit Tandukar
Project Title:	Gharko pasal	Month:	Dec
What have you done since the last meeting			
<p>Started working on artefact design</p> <p>Designed the frontend for website "Home page"</p>			
What do you aim to complete before the next meeting			
<p>User authentication</p> <p>update artefact design report according to feed back</p>			
Supervisor comments			

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

Student Signature: Rit

Date: 26th Dec

Supervisor Signature: Red

Date: 26th Dec

PROJECT MANAGEMENT LOG			
First Name:	Nabin	Surname :	Majhi
Student Number:	2051896	Supervisor:	Sachit Tandukar
Project Title:	Gharakar pasal	Month:	Jan
What have you done since the last meeting			
<p>Completed literature review and Artifact design Initial development of website User Authentication</p>			
What do you aim to complete before the next meeting			
<p>Show progress of artifact Work on front end</p>			
Supervisor comments			

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

Student Signature: 

Date: Jan 2

Supervisor Signature: 

Date: Jan 2

PROJECT MANAGEMENT LOG			
First Name:	Nabin	Surname :	Majhi
Student Number:	2051896	Supervisor:	Sachit Tandukar
Project Title:	Gharako pasal	Month:	Feb
What have you done since the last meeting			
<p>Completed artefact report and start methodologies</p> <p>Implemented user authentication</p>			
What do you aim to complete before the next meeting			
<p>Complete the remaining report</p> <p>Professional report for review</p>			
Supervisor comments			

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

Student Signature: Nabin Majhi

Date: 6th Feb

Supervisor Signature: Sachit Tandukar

Date: 27th Feb

PROJECT MANAGEMENT LOG	
First Name:	Nabin
Surname :	Majhi
Student Number:	2051896
Supervisor:	sachit Tandukar
Project Title:	Ghonyko Pasal
Month:	march
What have you done since the last meeting	
<p>Add to cart and place order</p> <p>Explore alternative of payments</p>	
What do you aim to complete before the next meeting	
<p>to work on bug or cart and increment decrement</p>	
Supervisor comments	

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

Student Signature: Ran

Date: 6

Supervisor Signature: fkd

Date: _____

PROJECT MANAGEMENT LOG	
First Name:	Nabin
Surname :	Majhi
Student Number:	2051896
Supervisor:	Sachit Tandukar
Project Title:	Ghar ka pasal
Month:	March
What have you done since the last meeting	
<p>Fixed cart Item error Created payment front end and loaded data into database from place_order menu.</p>	
What do you aim to complete before the next meeting	
<p>work on the 'POST' admin or place_order</p>	
Supervisor comments	

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

Student Signature: A*

Date: _____

Supervisor Signature: Sachit

Date: _____

PROJECT MANAGEMENT LOG	
First Name: Nabin	Surname : Mayhi
Student Number: 2051896	Supervisor: Sachit Tandukar
Project Title: Giharka Pasal	Month: April
What have you done since the last meeting	
<ul style="list-style-type: none"> * Initial coding for checkout function * store checkout on data base 	
What do you aim to complete before the next meeting	
<ul style="list-style-type: none"> * work on error with checkout system * fix data store problem 	
Supervisor comments	

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

Student Signature: 

Date: 3rd April

Supervisor Signature: 

Date: 25th April

PROJECT MANAGEMENT LOG	
First Name:	Nabin
Surname :	Majhi
Student Number:	2051896
Supervisor:	Sachit Tandukar
Project Title:	Ghar ka pasal
Month:	April
What have you done since the last meeting	
<p>Improve design of website</p> <p>work on payment system</p>	
What do you aim to complete before the next meeting	
<p>Integrate khati payment system</p> <p>work on errors from Login and Logout</p>	
Supervisor comments	

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

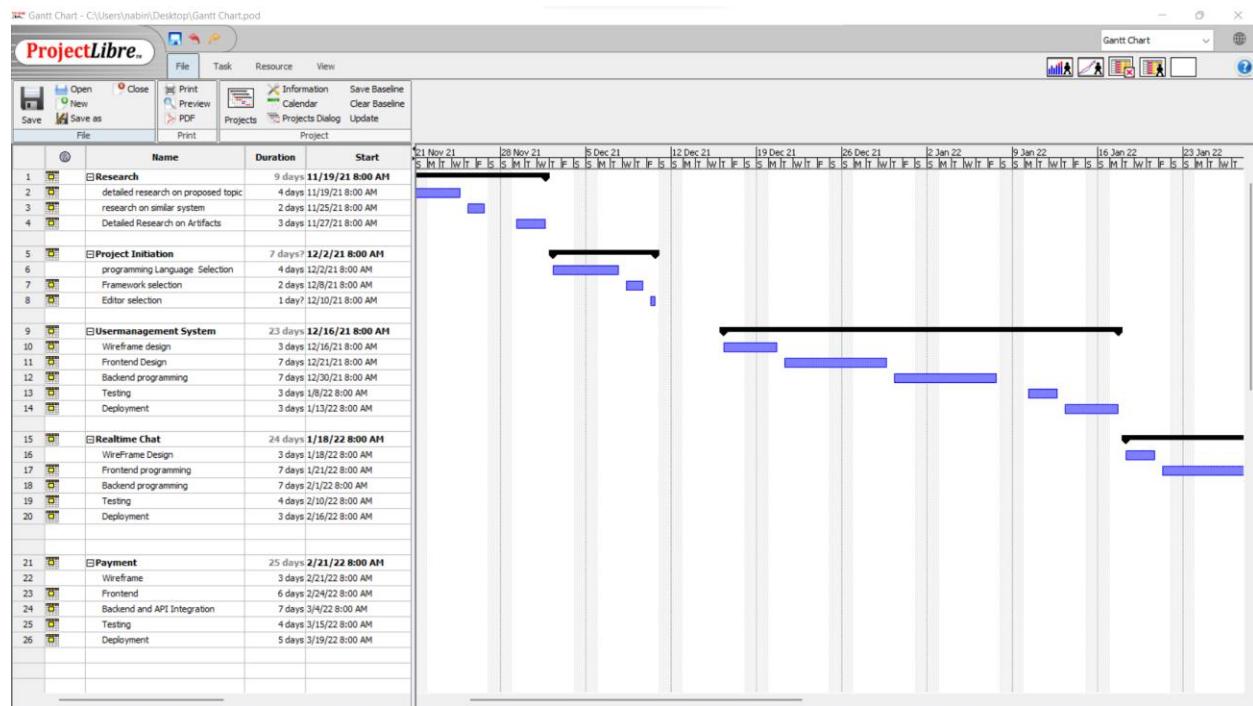
Student Signature: RN

Date: 17

Supervisor Signature: Sachit

Date: 25th April

Gantt Chart



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