

Chapter 1: Introduction

1.1 Background

E-commerce (Electronic Commerce) refers to the use of the Internet and the web for business transactions such as buying and selling goods and services, as well as commercial transactions (funds or data transmission), which typically involve the exchange of value (e.g., money) across organizational or individual boundaries in exchange for goods and services. We will concentrate on digitally enabled commercial interactions between businesses and individuals in this article.

When an exchange of value happens, e-business apps transform into e-commerce. All transactions mediated by digital technology and platform, i.e., those that take place via the Internet and the web, are considered digitally enabled transactions.

E-commerce has become one of the most popular ways to make money online, as well as a lucrative investment possibility. This article serves as an introduction to e-commerce for people interested in purchasing an e-commerce firm, including the reasons for its popularity, the primary distribution models, and a comparison of the various e-commerce platforms accessible [1].

The Administrators and the Customers/Users are the two key segments that make up this project. The administrators are the store manager and the employees. They have the ability to alter product names, pricing, and availability by adding, editing, updating, or deleting goods. The user may browse available products, edit their basket, take items out of it, and check out of the store. The client can also change his information, including names, addresses, and other details.

1.2 Problem statement

E-commerce makes it simple to sell things to a big number of people. There is, however, a lot of rivalry among e-commerce firms. Users expect to find what they're searching for fast and simply when they visit an e-commerce site. Furthermore, people are unsure about the brands or items they wish to acquire. They have a general concept of what they wish to purchase. Rather than visiting specific e-commerce sites, many shoppers increasingly look for their purchases on Google. They expect that Google will direct them to e-commerce sites where their goods is available.

1.3 Objective

- Manage online selling costs in a strategic way
- Provide a unique customer experience to capture market share
- Reach new customers and increase loyal customers
- Take costs out of serving customers

1.4 Scope

In the past several years, the e-commerce industry has experienced remarkable expansion. E-commerce became an essential component of the global retail system as a result of the global pandemic that fueled it. The benefits of online purchasing are currently enjoyed by customers in every nation. Numerous technical developments enable e-commerce companies to quickly and easily satisfy the expectations of their customers. Customers may utilize them to access anything with only a mouse click.

1.5 Limitations

- Huge Technology Cost
- Security
- Huge adverting cost
- High sipping cost
- Warehousing cost
- Complicated e-commerce policies

1.6 Process agile model

Agile is a project management style that prioritizes continuous improvement in the production of a product or service by utilizing short development cycles and communication among self-organizing cross-functional teams.

The agile SDLC model combines iterative and incremental process models, concentrating on process flexibility and customer satisfaction through quick delivery of functional software. Agile methods divide a project into tiny, incremental steps. Iterations of these builds are available.

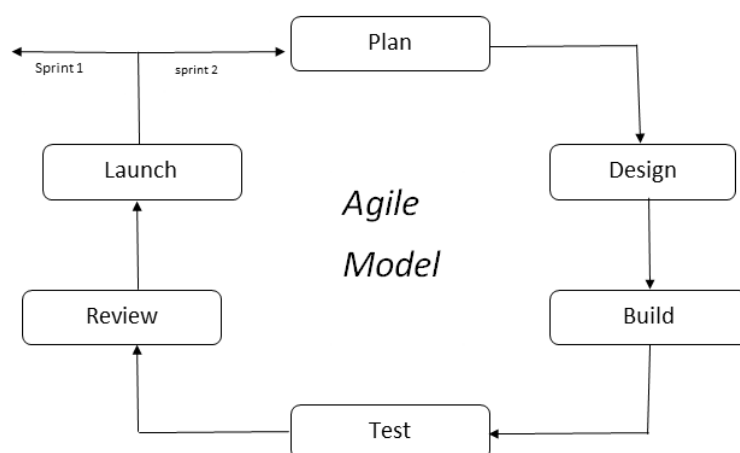


Figure 1: Agile methodology

Chapter 2

Requirement Analysis and Feasibility Analysis

2.1 Literature review

Reference [7] suggests using time window information to distinguish users' behaviors over time periods and improve rating prediction accuracy. To improve the accuracy of the recommendation, the corresponding attenuation factor is introduced based on the time when the item is added to the system.

Reference [8] provides a detailed classification and examples of recommender systems in E-commerce applications, as well as how they provide one-on-one personalized service and capture user loyalty; while these systems have proven to be successful in the past, their widespread adoption is still a work in progress. The application also revealed its flaws, such as the data set's sparseness and the issues associated with high dimensionality.

Reference [9] proposes a fuzzy mean clustering-based environment-aware recommendation algorithm. Because of the difficulties people have with environmental perception, fuzzy clustering is used to group the data, and qualified nonmembership data is mapped into membership data to improve the recommendation. The algorithm's accuracy overcomes the problems associated with traditional hard clustering.

The core idea in Reference [10] is to use the user trust network to select trustworthy neighbors; however, the current development, which is based on emotional recommendation technology, has made significant advances and improvements. Tsinghua University, for example, has identified the emotional corpus of some tourist attraction descriptions.

Researchers value literature [11] more than other recommendation technologies because it supports novel recommendations, deals with unstructured complex objects (such as videos and images), and improves recommendation quality. It has a wide range of applications and is very successful, but traditional collaborative filtering's problems of sparsity, scalability, and accuracy are impeding its further development.

In Reference [12], after the introduction of the recommendation system, the search method for users to find targets will change from the previous active to the so-called "passive" today, that is, recommending potential targets that users want to purchase or forming a list based on the history of browsing information and recommending to the users.

The above literature shows that the current E-commerce system is widely used around the world. The model recommendation personality is not prominent at this point, the relevance of the recommendation is insufficient, and the system is a single recommendation. Researchers, on the other hand, are actively studying and testing ways

to improve the traditional algorithm. The potential commercial value of recommendation systems is increasing day by day as their accuracy improves.

2.2. Requirement Specification

2.2.1 Functional Requirement

The actions and tasks that a system must be capable of doing are listed in the Function Requirement. The functional requirements of this project are defined with the use of Use case diagrams as follows:

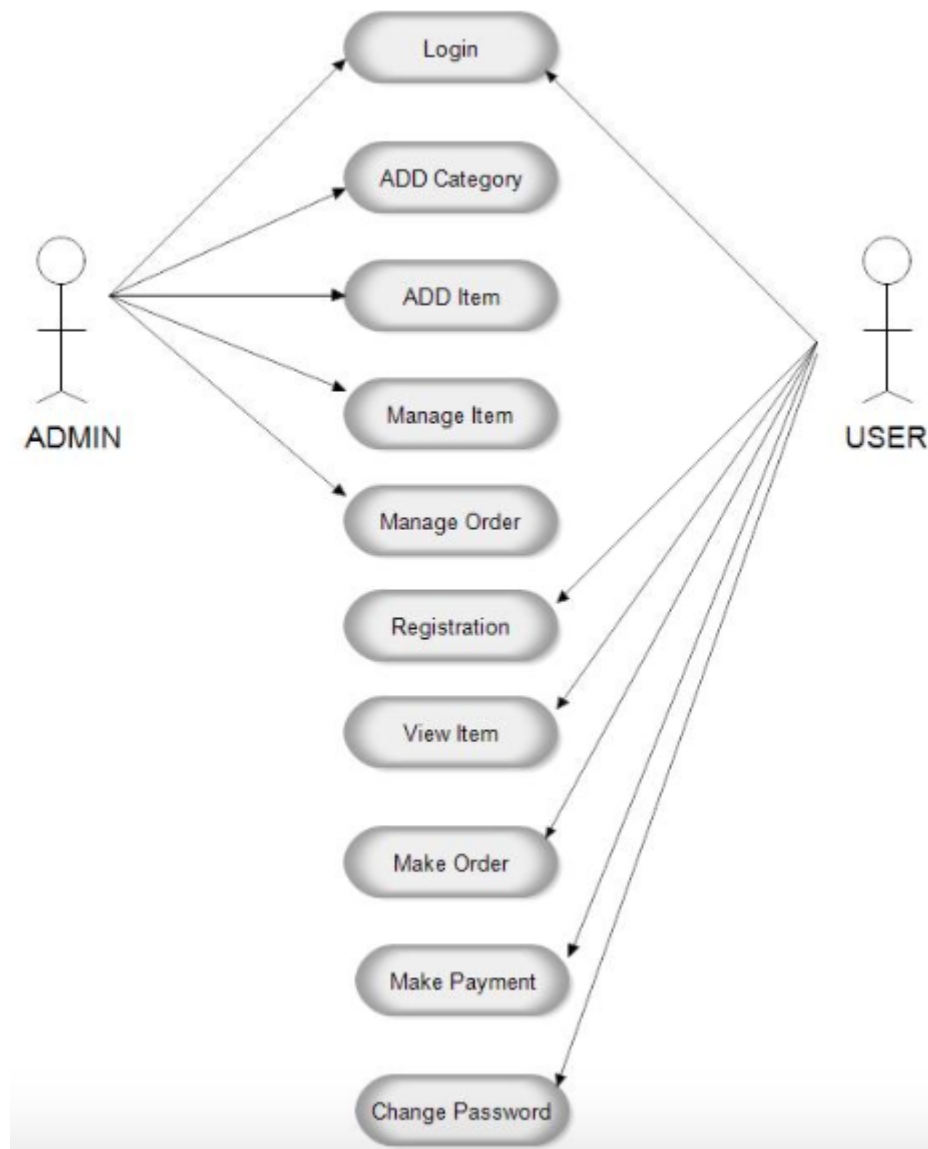


Figure 2: Use case diagram

2.2.2 Non Functional Requirement

1. Usability

Every module and webpage follow the same format. There is a back tab that gives access to the previous page to make navigating easier. Each page has clear instructions.

2. Reliability

Each data record is kept on an effective database structure that is well-built. No chance of data loss exists. The internal data analysis is well coded.

4. Performance

Products are sorted by categories and genre to make them more accessible. The system's throughput is boosted because to the lightweight database support.

5. Availability

There is no temporal limit on the system's availability.

2.3 Feasibility study

To ascertain the project's viability and reduce any risks, a feasibility study is carried out. Only then could the specific project be executed if it was clear that it could be completed financially. The feasibility study is a framework or a strategy for how to construct and manage the system successfully over the long term, not just a project research study. Following feasibility study was performed prior to working on the project:

2.3.1 Technical Feasibility

Technical feasibility assesses the expert system's technical difficulty and frequently entails analyzing whether it can be implemented using cutting-edge methods and tools. It also include assessing the system's hardware, software, and other technical needs.

Hardware Requirements: 1. Google play store. 2. RAM minimum 1GB

Software Requirements: 1. Operating system. 2. Android and Apple

2.3.2. Operational Feasibility

The degree to which a proposed system resolves issues, seizes opportunities discovered during scope definition, and meets requirements found during the requirements analysis stage of system development is measured by its operational feasibility. Additionally, it decides how it will fulfill each need found during the requirement analysis stage. Users may simply use the service offered across several platforms because the application is a platform independent solution. The user interface is simple to use and navigate. The system is therefore operationally practicable.

2.3.3. Economic Feasibility

The financial and logistical perspective for a commercial undertaking or venture is known as economic feasibility. Any system can be deemed economically viable if the projected benefits are equal to or greater than the estimated expenses. Cost-benefit analysis is carried out to determine the economic viability and analyze the anticipated expenses and benefits. The only expenses associated with creating this project are those associated with printing, binding, and system use. Since the necessary hardware and software were already purchased, the system is financially viable. The cost associated with this project is the time and effort of each team member. Furthermore, using this software is completely free for the user.

2.3.4. Schedule Feasibility

Table 1:Gannt chart

activities	1 Week	2 Week	3 Week	4 Week	5 Week	6 Week	7 Week	8 Week	9 Week
Requirement Gathering									
analysis and planning									
design									
Build									
Testing									
Review									
Launch									

Chapter 3: System Design

3.1. System Architecture and Overview

The structural layout of an application that automates tasks is called a system architecture. Typically, it consists of a number of diagrams that show the services, elements, levels, and interactions. The business, technical, security, and data aspects of a solution may all be included in a system architecture paper. In this project, we created a mobile application that works on any platform. Following is a diagram of the system architecture:

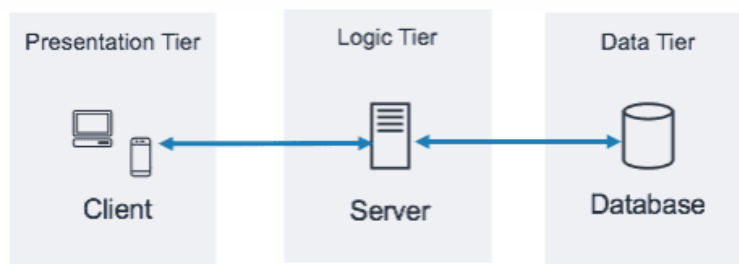


Figure 3: System architecture

3.2 UML Diagram

3.2.1. Class Diagram

A visual notation used to build and visualize object-oriented systems is the class diagram. In the Unified Modeling Language (UML), a class diagram is a sort of static structure that illustrates the classes, properties, actions, and connections between the objects in a system to explain the system's structure.

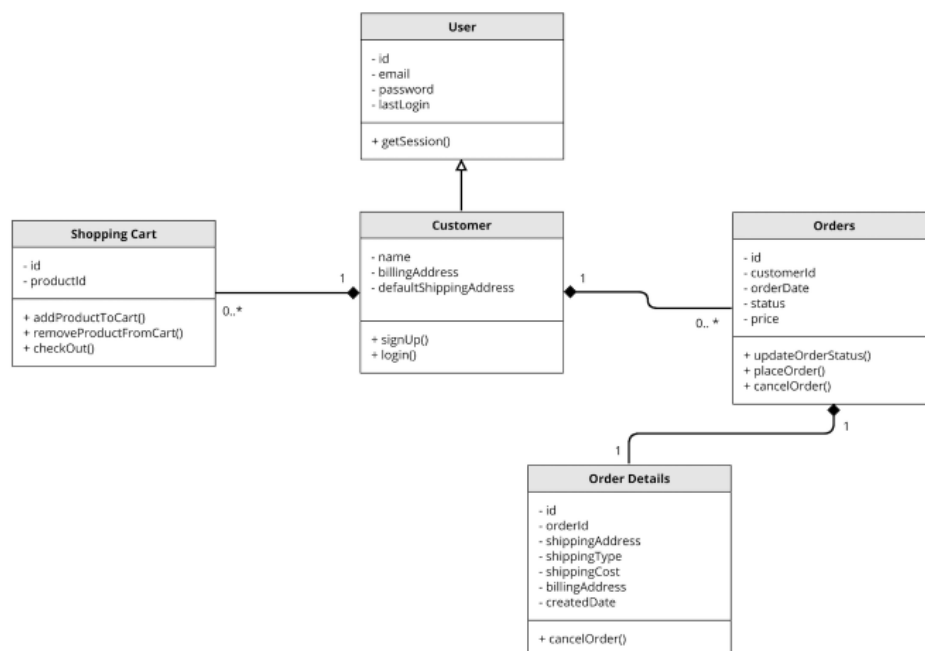


Figure 4: Class diagram

3.2.2. Sequence Diagram

Sequence diagrams show the interactions between several steps in an operation. They depict how items interact within the framework of a cooperation. In a sequence diagram, the time is the main emphasis, and the vertical axis of the diagram is used to represent time to illustrate when messages are transmitted and in what order.

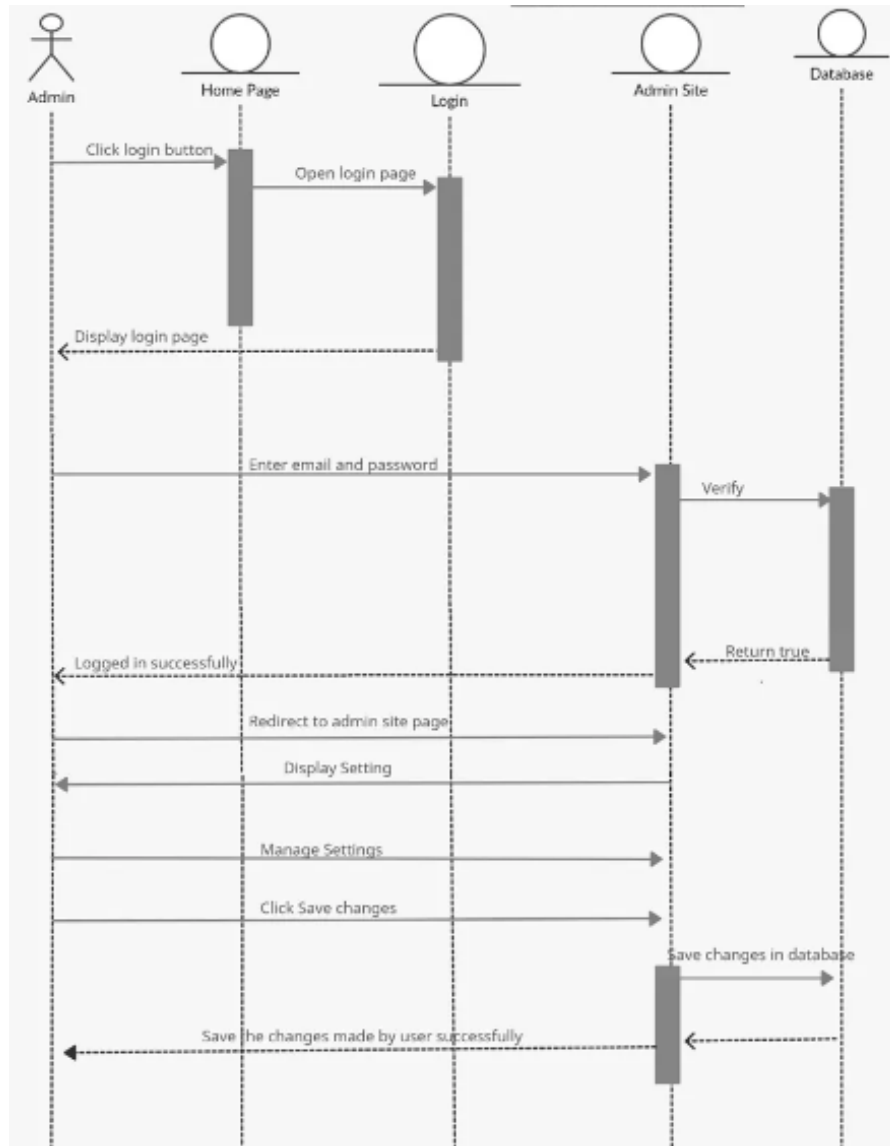


Figure 5:Sequence Diagram

3.2.3. Activity Diagram

Activity diagram is important behavioral diagram in UML diagram to describe dynamic aspects of the system. Activity diagram is essentially an advanced version of flow chart that modeling the flow from one activity to another activity.

Activity Diagram for User Side

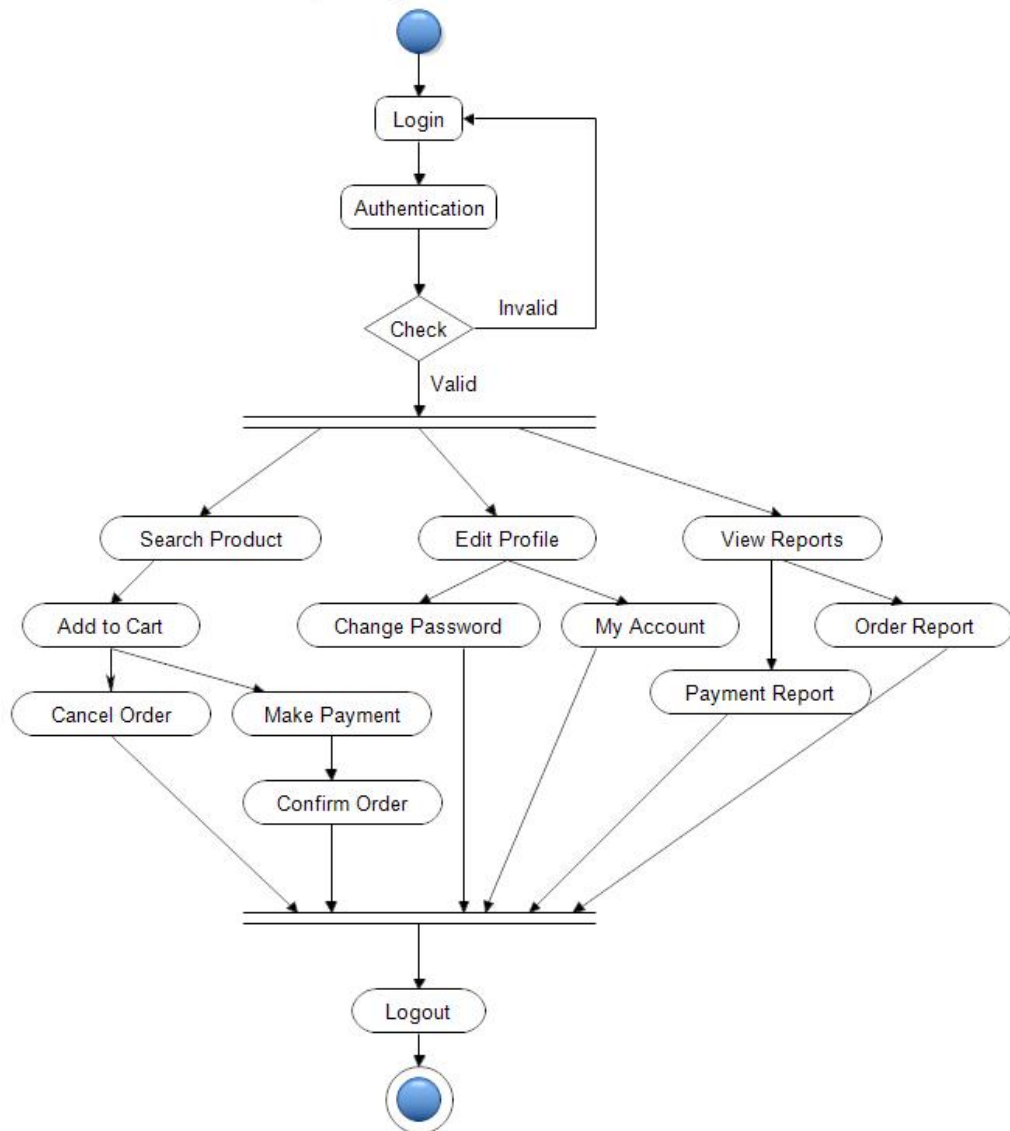


Figure 6: Activity diagram for user side

Activity Diagram for Admin Side

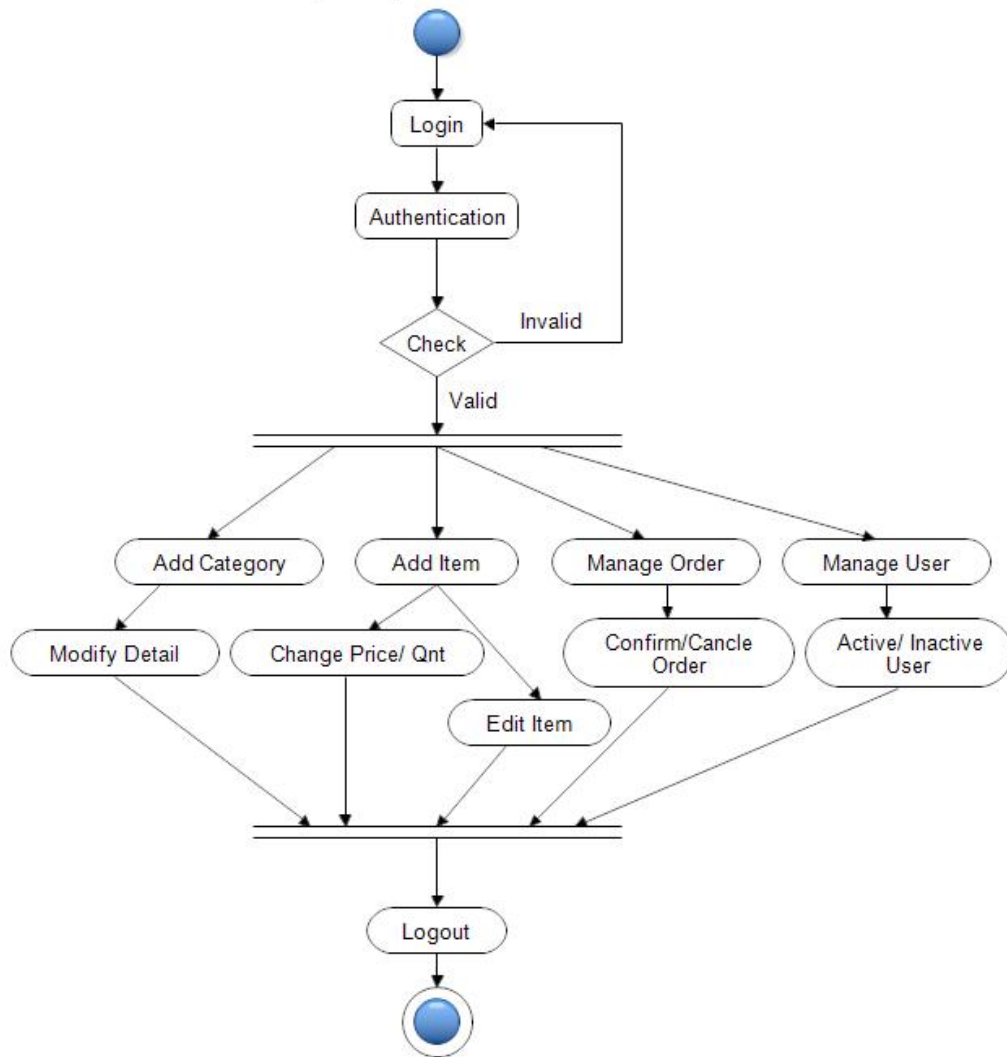


Figure 7: Activity diagram for admin side

Chapter 4: System Implementation and Testing

4.1 Tools used

4.1.1 HTML and CSS

A markup language called HTML is what gives our application its structure. In the program, text, paragraphs, and images are entered using HTML components. You may define that some sections of your content are headers or subheadings using heading elements. Both sorted and unordered lists are displayed using lists. To move from one page to another, utilize links. To develop forms for login, registration, profile updates, etc., HTML is utilized.

The language used to describe how Web pages are presented, including their colors, design, and fonts, is called CSS. It enables the presentation to be adjusted for use on many sorts of devices, including printers, tiny displays, and huge screens. The language we employ to style our HTML content is CSS. In our project, CSS is utilized to display various colors. It is used to generate padding and margins and to adjust the font family and size. Both inline and external CSS have been utilized.

4.1.2 Python

The Python programming language was created by Guido van Rossum and is an interpreted, object-oriented, high-level language with dynamic semantics. In 1991, it first became available. Python is used for server-side web development, software development, mathematics, and system scripting. It is also well-liked for rapid application development and as a scripting or glue language to connect existing components due to its high-level, built-in data structures, dynamic typing, and dynamic binding. Modular applications and code reuse are further made easier by Python's support for modules and packages.

4.1.3 MySQL

MySQL is a SQL-based relational database management system (RDBMS) created by Oracle. Rather than storing all data in one large warehouse, a relational database keeps it in discrete tables. It keeps data in tables with rows and columns. MySQL operates on almost every platform, including Linux, UNIX, and Windows. MySQL is built on a client-server architecture. MySQL is built around the MySQL server, which processes all database instructions (or commands). MySQL allows data to be saved and retrieved across various storage engines. It is written in C and C++ and is compatible with over 20 systems.

4.2 Testing

Table 2: Testing type

Testing Type	What process tests for
Page Display	Checking for any runtime errors Dead links or inappropriate font sizes Slow page downloads Wrong page display
Browser Compatibility	Incompatibility with certain browsers Poor performance with specific browser extensions Improper testing on major platforms like Windows, Mac OS X, and Linux

Analyzing Content	Checking for litigious or misleading content Any copyright infringement Checking for and removing out-of-date content
Usability	Poor design Lack of support Navigable links on the website Checking for link placements
Backup and Recovery	Frequency of backups Testing for backups by restoring them from time to time Fault tolerance
Processing Orders	Checking functionality of shopping cart Processing payments Tracking orders Recording of orders
Security	Login credentials – make sure credentials are changed regularly Computer viruses Ensuring data encryption

Chapter 5: Conclusion

5.1 Conclusion

In general, businesses nowadays must always work to provide the next greatest thing that customers will want since they constantly want their goods and services to be better, faster, and less expensive. Businesses in this age of emerging technology must adapt to the various new customer trends and wants since doing so will be essential to the survival and profitability of their organizations. With the development of technology, e-commerce is advancing and growing in significance for businesses; it is something that should be utilized and put into practice.

6. References

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