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An Undergraduate Internship/Project on Topic

"Bongo: An Online Shopping Management"

By

Md Sajed

Student ID: **1910566**

Summer, 2023

Supervisor:

Dr.Ashraful Islam, Phd

Supervisor's Designation

Department of Computer Science & Engineering

Independent University, Bangladesh

October 01, 2023

Dissertation submitted in partial fulfillment for the degree of
Bachelor of Science in Computer Science

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

I, Md. Sajed (ID: 1910566), hereby affirm that the report named "Bongo: An E-Commerce Platform for Daily Necessities Including Groceries, Apparel, and Cosmetics" has been authored and submitted to meet the criteria for the completion of my Computer Science & Engineering degree from Independent University, Bangladesh (IUB). My deepest gratitude goes out to Mr. Junaeb Abdullah Faruk, my supervisor, for his leadership and assistance during the internship. His extraordinary knowledge and skills have significantly aided in the completion of this project. Additionally, I attest that every piece of work in this report is fully original and reflects the knowledge and insight I gained from the internship. Each and every source of material used in this study has been appropriately credited and acknowledged.

I recommend getting in touch with my internship supervisor, Mr. Junaeb Abdullah Faruk, of Divine It Limited by email at faruk@divine-it.net for more details or clarification on this project.

· Signature · Date

Md Sajed

Name

Acknowledgement

I want to direct my profound gratitude for the implausible backing and guidance, I have received throughout my internship expedition. In my academic and professional life, this experience has been a transforming and enriching chapter. I want to begin by sincerely thanking the Almighty for providing me this opportunity. I am immensely appreciative of my family, friends, and coworkers who have supported me and believed in my abilities and who have been consistent pillars of strength. Their belief in me and their encouragement have been a constant source of motivation. I owe a debt of gratitude to the specialists and practitioners in the fields of computer science and software development who kindly contributed their information and assets via scholarly publications and online communities. My knowledge and abilities have been much improved by their efforts.

I must express my gratitude to Dr. Ashraful Islam, my academic supervisor, whose mentoring and direction have significantly influenced the direction of my academic career. His help has been quite beneficial.

Mr. Junaeb Abdullah Faruk, who oversaw my internship, deserves special praise for the essential assistance, guidance, and inspiration he provided. I feel myself fortunate to have had the chance to work under his supervision because his energizing words and directives have inspired me to go above and beyond my own expectations.

I also want to thank Divine It Limited's complete staff for giving me a pleasant and professional environment in which to use my knowledge and abilities. My internship experiences have been successful and enjoyable thanks to their cooperation and willingness to help at every stage.

I would want to express my heartfelt appreciation to my teachers, for providing me with the knowledge and skills I needed to succeed in both my academic and internship endeavors.

Finally, I'd want to thank the Almighty for leading me and express my faith that the knowledge I've learned from this internship would be useful to me in my future job in computer science. I want to convey my gratitude to everyone who helped make this beautiful experience possible and let you know that you will always hold a special place in my heart.

Letter of Transmittal

Date: 01/10/2023

Dr. Ashraful Islam

Assistant Professor

Department of Computer Science & Engineering,

Independent University, Bangladesh.

Subject: Submission of Internship Report for Graduation Requirement

Dear Sir,

I hope this correspondence finds you well. I am reaching out to submit my internship report, a vital requirement for my computer science and engineering bachelor's program. It has been an enriching experience to receive your valuable guidance and mentorship during my academic pursuit. The report I present today encapsulates my extensive learning and practical experiences gained during my three-month internship at "Divine IT Limited." Under the capable mentorship of Mr. Junaeb Abdullah Faruk, I had the privilege of contributing to real-world projects and honing my skills in a professional environment. In preparing this report, I have diligently adhered to the prescribed guidelines and furnished comprehensive details as required. My objective is to provide a well-rounded account of my internship, blending academic knowledge with practical insights.

I want to take this chance to thank you sincerely for your guidance and support throughout the years. I am sincerely appreciative that I had the opportunity to learn under your supervision because your advice has played a significant role in shaping both my academic and professional development.

I hope I was able to meet all your expectations in this report. Finally, I want to say a big thank you for helping me and being so courteous to all of my questions.

Sincerely,

Md Sajed

ID: 1910566

Department of Computer Science and Engineering,

Independent University, Bangladesh

Evaluation Committee

Evaluation Committee

Supervision Panel

Academic Supervisor	Industry Supervisor

Panel Members

Panel Member 1	Panel Member 2

Office Use

Program Coordinator	Head of the Department

Abstract

During my three-month Project Internship, I undertook a sizable programming project with the goal of creating the sophisticated e-commerce web application "Bongo." Through the use of the Django web framework, this project seeks to satisfy the changing needs of today's online shoppers. Utilizing Django's features combined with Bootstrap and jQuery for a better user experience, the main objective is to build a user-friendly online marketplace with secure payment processing capabilities.

The project follows a systematic approach, going through stages including gathering and assessing functional requirements, constructing a scalable database schema using the built-in SQL-Lite database, putting in place a secure backend, and creating a user-friendly frontend. The site's looks and functionality are improved by the usage of Bootstrap and jQuery, giving customers a seamless buying experience.

Potential future enhancements for "Bongo" include integrating multiple payment gateways, instituting intelligent product recommendations, creating native mobile applications, supporting multiple languages, and incorporating analytics tools for data-driven decisions. This project not only addresses the current challenges in the E-commerce industry but also anticipates and adapts to the dynamic landscape of tomorrow's digital marketplace.

In summary, "Bongo" is an ambitious project that combines the power of Django with modern web development technologies to create an innovative E-commerce platform. It aspires to enhance the shopping experience for consumers and empower businesses to thrive in the ever-evolving E-commerce ecosystem.

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Chapter 1-Introduction

1.1 Overview/ Background of the Work

E-commerce has caused a paradigm change in the retail industry, profoundly changing how businesses function and how customers engage with the world of commerce. This transformational phenomena is supported by a slew of fundamental benefits that e-commerce brings to the fore. The most significant of these benefits is the unequalled convenience it provides, allowing consumers to engage in buying activities 24 hours a day, seven days a week, without being restricted by physical store hours. Consumers have a wide range of options at their disposal thanks to the sheer depth and breadth of the product selections offered by e-commerce platforms, which go hand in hand with this accessibility. The competitive pricing strategies employed in the e-commerce sector have also fueled its explosive expansion by enabling customers to find the best deals and value for their purchases.

Platforms for e-commerce are excellent at personalizing the buying experience, adjusting product recommendations and content to user preferences. It is obvious that the development of thorough online marketplaces is essential given the e-commerce industry's phenomenal rise. These marketplaces must be capable of more than just facilitating transactions; they also need to exhibit qualities like dependability, scalability, and security. In order to gain the trust of customers, it is important to protect sensitive user data and financial information. For the purpose of offering a consistent and uninterrupted buying experience, reliability, which includes components like platform uptime and responsiveness, is essential. Scalability is also crucial since e-commerce platforms need to be able to handle increasing user and product listings without suffering performance losses.

The Django framework takes center stage as the foundation for creating various and potent e-commerce platforms in this dynamic and demanding industry. Django, a programming language renowned for its adaptability, security, and scalability, offers developers a strong foundation for creating online markets that not only meet but also anticipate the shifting needs and expectations of both consumers and businesses. In other words, Django makes it possible to build e-commerce platforms that seamlessly integrate the advantages of online shopping with the crucial attributes of reliability, scalability, and security, so promoting the ongoing growth of the retail industry in the digital age.

1.2 Objectives

The main goals of this initiative span several crucial areas, including:

Creation of a Fully Functional Online E-Commerce Marketplace: The core of the project is the creation of a comprehensive platform that makes it simple for users to browse, discover, and buy products. Important components of this concept include a sophisticated shopping cart system, rich and detailed product pages, and an extensive product listing.

Secure User Authentication and Payment Processing Implementation: Security is of the utmost significance in the world of e-commerce. This project is dedicated to the attentive deployment of strict user authentication procedures designed to protect user accounts and the sensitive information they entrust. In addition, to preserve the integrity and secrecy of financial transactions, the project places a high priority on secure payment processing.

Performance and Scalability Optimization: Recognizing the marketplace's growth trajectory, the project priorities ensuring that the platform retains excellent performance even as it scales. The project's vision is underpinned by the dual goals of scalability and performance optimization, which ensure that it can elegantly accept a rising user base, extensive product listings, and high transaction volumes while remaining quick and reliable.

1.3 Scopes

The scope of this project encompasses several fundamental domains:

User Registration and Authentication:

A key feature is user registration, which allows users to create accounts and receive personalized services. To safeguard user credentials and account information, the authentication system is fortified with industry-leading security practices such as strong password hashing and salting.

Product Listing and Management:

The project comprises developing a comprehensive product listing system that would enable vendors to easily add, amend, and manage their product offers. Users can then easily browse goods by category, apply filters, and get extensive product information, such as enticing pictures, thorough descriptions, correct pricing, and real-time availability status.

Shopping Cart Functionality:

Customers can confidently add products to their baskets, review their selections, and proceed to secure checkout thanks to a robust and user-friendly shopping cart capability. Real-time price calculations and inventory checks are part of the shopping cart system, which enhances the entire purchasing experience. Users have the option to edit the items in their shopping carts and remove items as desired.

Payment Processing Security:

Payment processing security is of the utmost significance. To support seamless and secure financial transactions, the platform integrates with trusted and secure payment gateways. Payment information, including sensitive data such as credit card numbers, is rigorously encrypted and securely sent to protect the confidentiality of consumers. Users are notified promptly of successful payment transactions, giving them the peace of mind they deserve.

Order Management:

The platform's key functionality is comprehensive order management. Users may easily track their orders, access their whole order history, and receive timely email reminders regarding order status updates. The technology simplifies the order fulfilment process for suppliers, allowing them to rapidly designate orders as sent while maintaining real-time control over order statuses.

While the project places a strong emphasis on mobile responsiveness to ensure universal accessibility across diverse devices, the development of a dedicated mobile application and extensive third-party integrations beyond essential functionalities fall outside the project's current scope.

Chapter 2 - Literature Review

2.1 Relationship with Undergraduate Studies

The Online Shopping Web Application "Bongo" project's development has helped from the knowledge that learned in IUB's undergraduate program. Not having completed these courses prior to beginning this assignment would have been challenging. Several of the courses include:
CSE451: My undergraduate education was heavily influenced by software engineering principles and practices. The necessity of systematic and disciplined approaches to software development was emphasized in this curriculum. Throughout the project's history, concepts such as software development life cycles, design patterns, and version control have been used. This software engineering foundation produces effective project management, code organization, and system design. The project has maintained code quality, modularity, and maintainability by adhering to best practices and principles. Version control solutions have also made it easier for team members to collaborate and track changes and code progress.

CSE309: Throughout my computer science undergraduate courses, I developed a solid understanding of the fundamentals of web programming. I was able to design front-end and back-end web applications thanks to this, which gave me the skills I required. My understanding of web development is based on server-side scripting languages, HTML, CSS, and JavaScript. These skills were essential in creating the user interface and user experience for the e-commerce platform. The layout, visual aesthetics, and interactivity of the user interface are critical in engaging and maintaining online buyers. My schooling equipped me with the skills to create an intuitive and visually appealing user interface, providing a smooth buying experience.

CSE307: During the system analysis course, I acquired knowledge of requirement analysis and diagram drawing. This knowledge facilitated my comprehension of client requirements, enabling me to develop the program accordingly.

CSE303: Database management systems and database design principles were important to my undergraduate education. This information has been directly applied to the data architecture of the e-commerce platform. Understanding relational databases, SQL querying, and data normalization has been extremely helpful in developing a scalable database schema .The database is the platform's backbone, allowing for data storage, retrieval, and management.

Product cataloguing, user account administration, and order processing are all made easier by the ability to construct a well-organized and normalized database schema. This, in turn, improves the platform's responsiveness and dependability.

CSE203 & 211: Learning about data structures and algorithms has facilitated my adjustment to the architecture of various programming languages.

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2.2 Related works

E-Commerce systems are necessary for many firms' daily operations, hence several projects with comparable scopes exist.
Some of the highlights are as follows:

- **FASHE.**
    - Language/Framework: Using Django
    - GitHub Repository https://github.com/zinmyoswe/Django-Ecommerce
- **E-Commerce.**
    - Language/Framework: Using Django
    - GitHub Repository https://github.com/ruhulaminparvez/eCommerce

- **SHUUP.**
    - Language/Framework: Using Django
    - GitHub Repository https://github.com/shuup/shuup

Chapter 3 Project Management & Financing

3.1 Work Breakdown Structure

The creation of a comprehensive Work Breakdown Structure (WBS) was critical to good project management. It offered a disciplined framework for organizing and carrying out the project's many tasks and activities. Every stage and action was methodically planned:

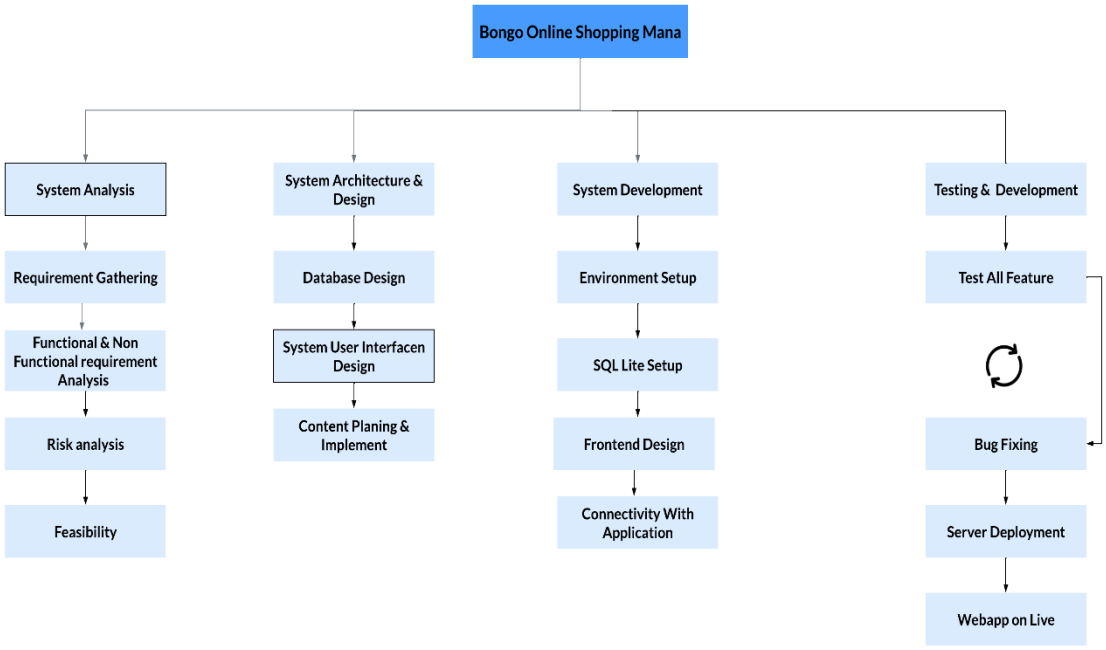


Figure 3.1 Work Breakdown Structure

3.2 Process/Activity wise Time Distribution

A thorough timeline was prepared for each project phase and activity to ensure efficient progress and adherence to project deadlines. The general timetable and milestones of the project influenced this timeline. The project team may effectively manage resources and evaluate progress by assigning specified deadlines to each activity. Staying on track and meeting project goals within the timeframe required timely completion of activities and phases.

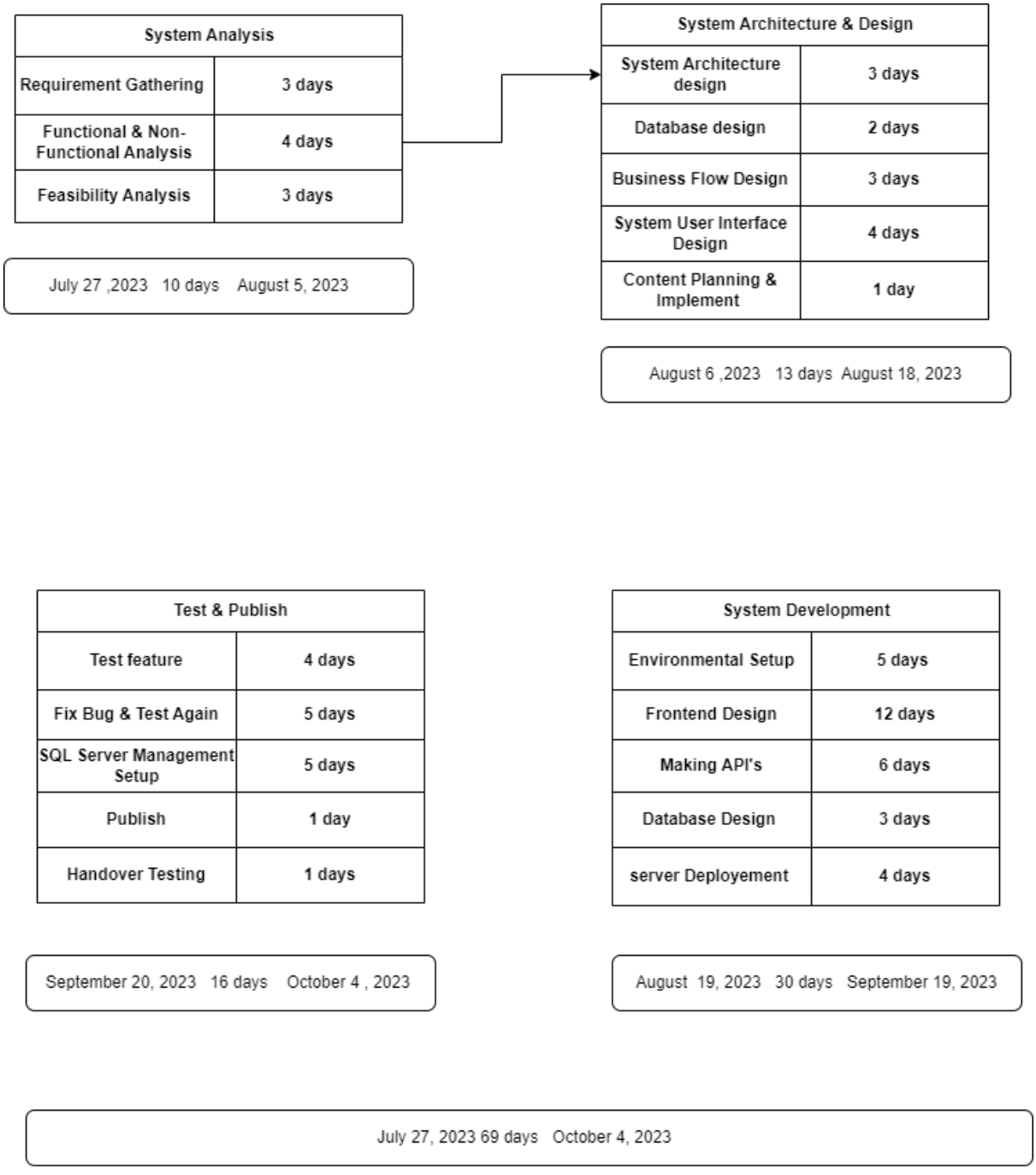


Figure 3.2 Time Distribution

3.3 Gantt Chart

During the application project's planning stage, a Gantt chart was used. To track and visualize project timelines, Gantt charts are frequently used in project management. They offer insightful information on task dependencies, development, priorities, and resource allocation. Gantt

charts provide a clear picture of tasks and their associated timelines using a bar chart format. The key resource for this project was determined to be the developers, with office PCs and servers being necessary for implementation. Each employee was given particular assignments with due dates, and they all worked together to finish the project. The project's exact steps are described in the section that follows.

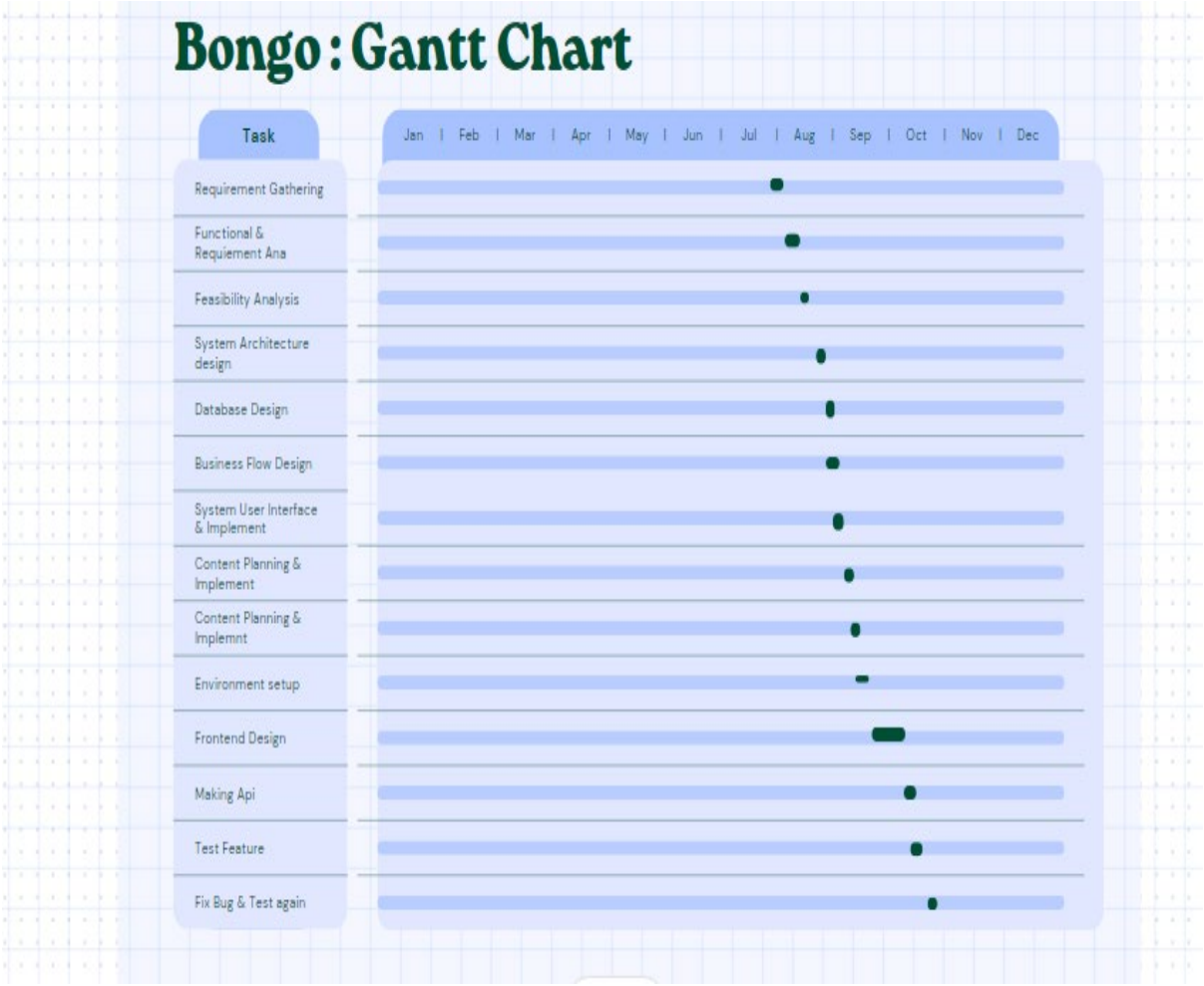


Figure 3.3 Bongo: Gantt Chart

3.4 Process/Activity wise Resource Allocation

The project's success hinged on the efficient deployment of resources.. Important factors to consider included:

1. **Project Planning:** The first part of the project set the framework for the entire Endeavour. It entailed defining the project's goals, scope, and requirements. To establish a clear knowledge of project aims and potential problems, project documentation such as the project charter, scope statement, and risk assessment were created.

2. **Requirement Gathering:** Accurate project requirements were a vital phase that included engaging stakeholders. To guarantee that the platform's features fit with user expectations and market demands, interviews, questionnaires, and user feedback sessions were undertaken.
3. **System Design:** The focus of the design phase was on creating the architectural framework for the e-commerce platform. Designing database schema, designing user interfaces, and choosing a technological stack were all included in this. Design selections were influenced by best practices and user-generated design concepts.
4. **Implementation:** The e-commerce platform was created using Django and related technologies during the implementation phase. In addition to developing features like product listings, shopping cart functionality, and secure payment processing, it also involved coding, database integration, user authentication implementation, and feature development. This stage followed coding best practices and standards to guarantee code quality.
5. **Testing and Quality Assurance:** Extensive testing was used to confirm the platform's dependability and functionality. The approach included unit testing, integration testing, user acceptance testing, and performance testing. Bugs and difficulties were found, recorded, and fixed in order to provide a stable and error-free platform.
6. **User Training:** End-user training materials and documentation have been created to assist both end-users and administrators. Training sessions were held to ensure the platform's smooth and successful implementation. To enable users to make the most of the platform's features, clear and accessible training resources were given.

7. **Documentation:** During the documentation phase, extensive user manuals, system documentation, and technical guides were created. These materials were critical in assisting with continuous system maintenance and troubleshooting. Users and administrators could get essential information when needed thanks to detailed documentation.

8. **Maintenance:** Following deployment, continuous maintenance operations were planned to maintain the e-commerce platform's continued performance and functionality.

9. **System Monitoring:** The platform's performance, security, and availability were all continuously monitored. Monitoring tools were used to detect and respond to any anomalies or concerns as soon as possible.

10. **Software Updates:** Both the platform's basic software components and any third-party integrations received regular updates and patches. This proactive strategy assured that the platform was secure and up to date with the most recent technology and security advancements.

11. **User input and Support:** A mechanism was built for users to submit input and report issues. User feedback was critical in determining areas for improvement and guiding future upgrades. A dedicated support crew was on hand to assist users with any questions or issues they experienced.

12. **Scalability Planning:** In order to anticipate the platform's expansion, scalability planning was an essential component of maintenance. As needed, strategies for accommodating growing traffic, extending product catalogues, and assuring peak performance were developed and implemented.

3.5 Estimated Costing

Since this is a testing project and no actual user will use it every day, the cost is minimal. But if this initiative is continued and actual users are included, the costs will be as follows:

- Frontend development (Bootstrap, query): 100,000 BDT
- Backend development (Django): 150,000 BDT
- Database (SQL Server): 50,000 BDT
- Payment service: 20,000 BDT
- Other costs (hosting, domain name, etc.): 80,000 BDT

Total: 300,000 BDT

Chapter 4 - Methodology

The Agile development methodology was adopted. Agile methodologies emphasize flexibility, collaboration, and customer-centric development. So, the project was broken down into small, manageable increments known as "sprints." A specified set of features and functionality were produced, tested, and reviewed during each sprint. This iterative process enabled quick development and ongoing improvement. Moreover, testing was a regular element of each sprint, ensuring that newly built features met quality criteria. Frequent testing and quality assurance practices reduced the possibility of problems accumulating and made bug identification and resolution easier.

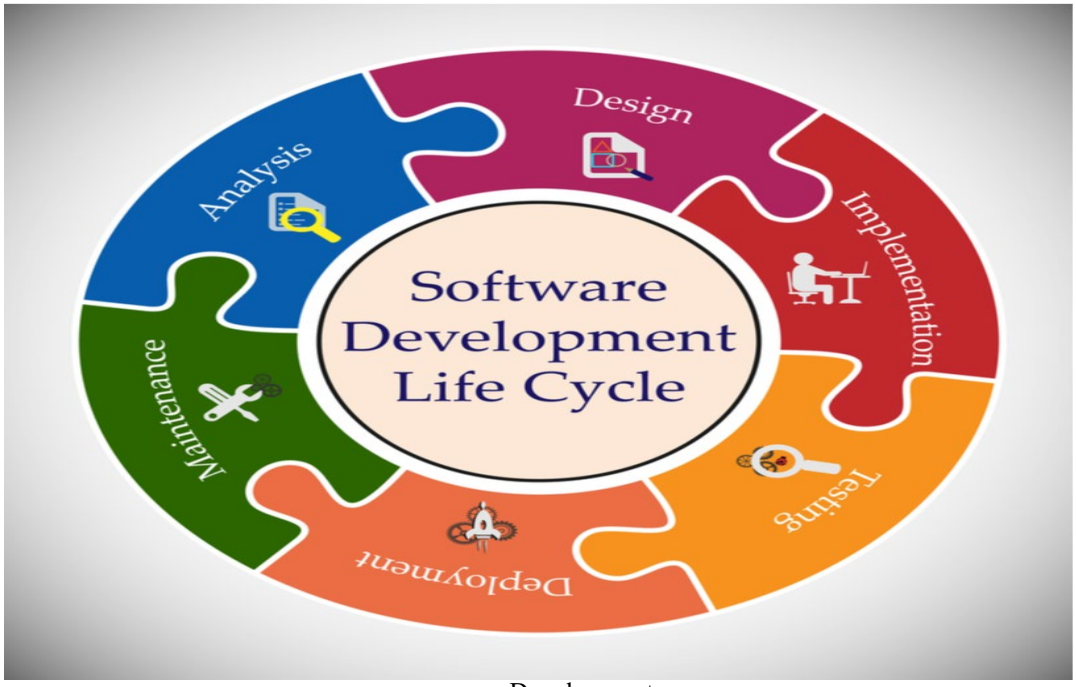


Figure 4.1 Agile Development

4.1 Why Agile for this project?

The ideal approach for projects with changing or ambiguous needs is Agile. The project team was able to react to changing needs, user feedback, or market circumstances, ensuring that the final product met user expectations and company goals. Therefore, we can say that the agile methodology provided the project with a dynamic and adaptive development process that encouraged cooperation among team members and stakeholders.

Chapter 5 - Body of the Project

The creation of a dynamic and feature-rich e-commerce platform is at the center of this project. This section investigates the project's objectives, requirements, analysis, design, implementation, and testing, all of which contribute to the development of a robust and user-centric platform.

5.1 Work Description

Assigned Role:

Trainee Python Developer

Joining Date:

June 27, 2023

Project Start Date:

August 17, 2023

Project Completion Date:

October 1, 2023

Work on a daily basis:

As a trainee at Divine IT Ltd, I wanted to learn Python from scratch, either through office-session lessons or online courses or online document.

The Django framework had to be learned, developed, and integrated with Python projects as well. I started by making little Windows Forms applications for educational purposes before going on to the major project.

From the ground up, I created, implemented, coded, tested, and maintained everything

5.2 Requirement Analysis

Rich Picture

A rich picture is a visual representation or diagram that helps to illustrate complex situations, systems, or processes in a simplified and holistic manner. The case of an e-commerce site like "Bongo," a rich picture might offer a visual breakdown of the numerous components, stakeholders, and interactions present in the system. Here is an illustration of what a rich picture for an online store may contain:

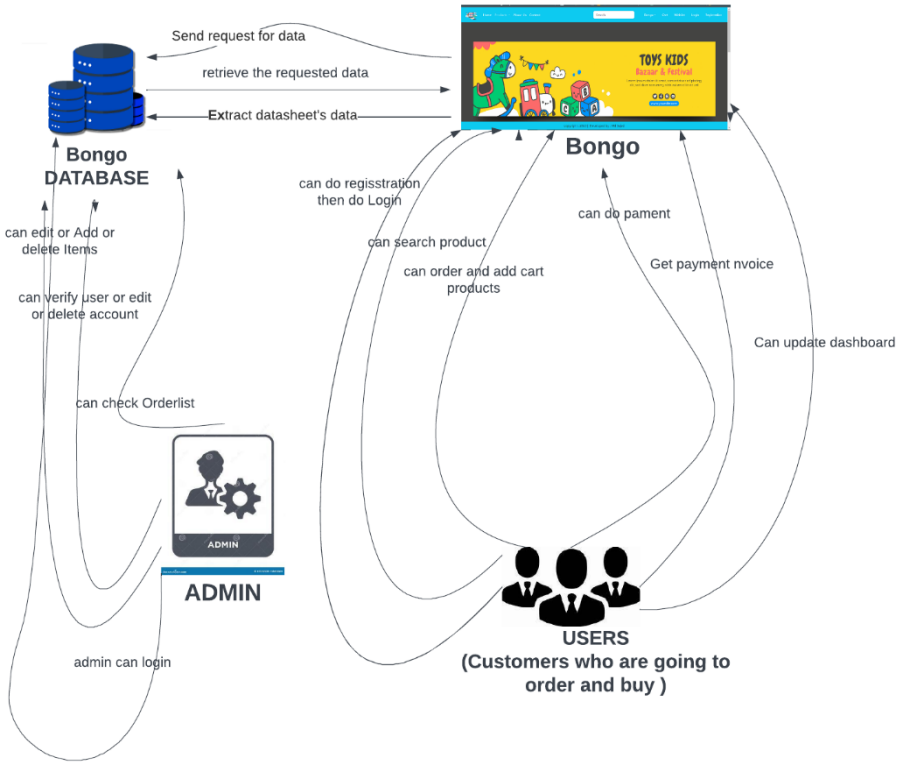


Figure5.2. 1 Rich Picture

Functional and Non-Functional Requirements

5.2.1- Functional Requirements of Bongo:

- **User Registration:** Users will be able to register an account and securely log in.
- **Product Search and Filtering:** Users will be able to search for services based on category, brands or specific keywords.
- **Product Catalog:** Showcase a catalog of products with images, descriptions, prices, and availability.
- **Shopping Cart**: Allow customers to add products to a virtual shopping cart, see and amend the cart's contents, and check out.
- **Wiz list:** Allow customers to add items to a Wiz list or favorite list for further use while shopping.
- **Admin Dashboard:** A dashboard for site managers that allows them to add, amend, or remove goods and categories as well as manage orders and products.
- **Responsible Design:** Make sure the web application is mobile-friendly and optimized for different devices and screen sizes by using responsive design.
- **Manage User Profile:** User can update their personal information in their profiles and examine product history.

5.22 - Non-Functional Requirement of Bongo:

- **Perform**: Rapid page loads and responsiveness; management of concurrent user traffic during peak hours.
- **Safety**: Implementing secure authentication and data encryption procedures, the system guarantees the integrity and confidentiality of user data and it will be fully safe.
- **Serviceability**: The user interface (UI) must be user-friendly and easy to understand, enabling users to navigate the system seamlessly and carry out tasks efficiently, ensuring a fluid and hassle-free user experience.

- **Constancy**: To prevent down and ensure service continuity, the system should be dependable and accessible at all times.

- **Expandability**: To support future expansion, the system should be scalable, enabling the addition of new service providers and customers without degrading performance.

- **Capability**: Supporting numerous web browsers and mobile operating systems, the system should be interoperable with a range of hardware and platforms.

- **Longevity**: To evaluate how the system functions at various levels of concurrent user activity, undertake load testing.

- **Data Recovery & Backup**: Data backup and recovery: To prevent data loss, regular data backups should be carried out. In the event of system breakdowns or other emergencies, a data recovery process should also be in place.

5.3 System Analysis

5.3.1 Six Element Analysis

Process	Human	Hardware	Software	Database	Network
Login	All	PC/ Tablet / Phone	Bongo WebApp	Data Store & retrieves Login Data	Internet
Update User	admin	PC/ Tablet / Phone	Bongo WebApp	Update Users details	Internet
Delete User	admin	PC/ Tablet / Phone	Bongo WebApp	Delete Users From Database	Internet
Upload Product	admin	PC or Phone or Tablet	Bongo WebApp	Store Products Details	Internet
Update Product	admin	PC or Phone or Tablet	Bongo WebApp	Update Product details	Internet

Delete Product	admin	PC or Phone or Tablet	Bongo WebApp	Delete Products From Database	Internet
Order Item	Customer	PC or Phone or Tablet	Bongo WebApp	Order will be Save in Database	Internet
Update Dashboard	Customer	PC or Phone or Tablet	Bongo WebApp	Updates data from User end to Database	Internet

5.3.1 Six Element Analysis

5.3.2 Feasibility Analysis

Evaluations of the technical, operational, and financial viability Feasibility studies were carried out to assess the project's potential from numerous angles:

- **Technical Feasibility:** With the resources and technological stack at hand, this study confirmed that the project could theoretically be implemented. It took into account elements including infrastructure needs, developer experience, and technological compatibility.

- **Operational Feasibility:** This factor determined how easily the concept might be incorporated into the current operational environment. It took into account elements such as the effect on current operations, resource allocation, and user training.
- **Operational Feasibility:** The concept's ability to be implemented in the current operational environment was determined by this criteria. It included factors like the impact on ongoing operations, resource allocators, and user training.
- **Economic feasibility:** This element examined the project's cost-benefit analysis. It considered the anticipated project expenses, possible revenue streams, and overall return on investment (ROI).

The viability and sustainability of the project were revealed by these evaluations.

5.3.3 Problem Solution Analysis

- **Taking on Major Industry Challenges:** The initiative sought to offer efficient answers to the problems that the e-commerce business faces. Some of the significant issues were.

- **User Trust:** Establishing user trust was crucial. In order to inspire users' confidence, this required creating secure user authentication, open privacy rules, and dependable customer assistance.
- **Payment Security:** Keeping payments secure was of utmost importance. Users' payment information was handled with the utmost care and encryption thanks to the project's integration with reputable and secure payment gateways.
- **Product Discoverability:** It was important for suppliers as well as users to improve product discoverability. Users were helped in finding interesting products by the use of sophisticated search algorithms, tailored recommendations, and useful categorisation.

5.3.4 Effect and Constraints Analysis

- **Anticipated Effects:** Grounded on the project's potential to affect users and the business, expected effects were assessed.

- **Enhanced User Experience:** It was anticipated that the addition of user-friendly features, such customized recommendations and a quick checkout procedure, would improve the experience for all users. It was expected that this would boost user retention and happiness.

- **Business Growth:** It was anticipated that the effective design and implementation of the e-commerce platform would lead to business growth. It was believed that the platform's ability to draw in vendors and customers, along with effective payment processing, would lead to income generating.

- **Constraints:** For proactive management, awareness of potential restrictions was essential.

- **Resources Constraints:** The project was constrained by a lack of resources, particularly manpower and funding. In order to complete the project within these limitations, resource allocation and prioritization were crucial.

- **Market Restraints:** The e-commerce market's dynamism caused difficulties. Strategic planning and flexibility were needed to compete with established platforms and adapt to shifting consumer preferences.

5.4 System Design

Modules, architecture, components, interfaces, and data are only a few examples of the aspects of a system that are specified during the important process of system design in software development.

- Detailed System Design Specifications: The system design process required the development of comprehensive specifications for a number of project-related elements.

- Database Schemas:: To ensure effective data storage and retrieval, the database design was carefully prepared. In order to achieve the best database performance, this involved designing tables, relationships, and indexes.

- User interfaces Layouts: The process of designing user interfaces (UI) included developing wireframes and layouts that prioritized usability and aesthetic appeal. In order to acquire user feedback and confirm design decisions, prototypes were created.

- API Integrations: Integrations with external APIs and third-party services, such as payment gateways, were meticulously planned and documented. As a result, connectivity between the platform and external systems was frictionless.

System design set the foundation for the development process by giving programmers precise instructions and specifications to adhere to.

5.4.1 UML Diagrams

The Unified Modelling Language (UML) is used to create UML diagrams, which are visual representations of a system's numerous components.

Entity Relationship Diagram:

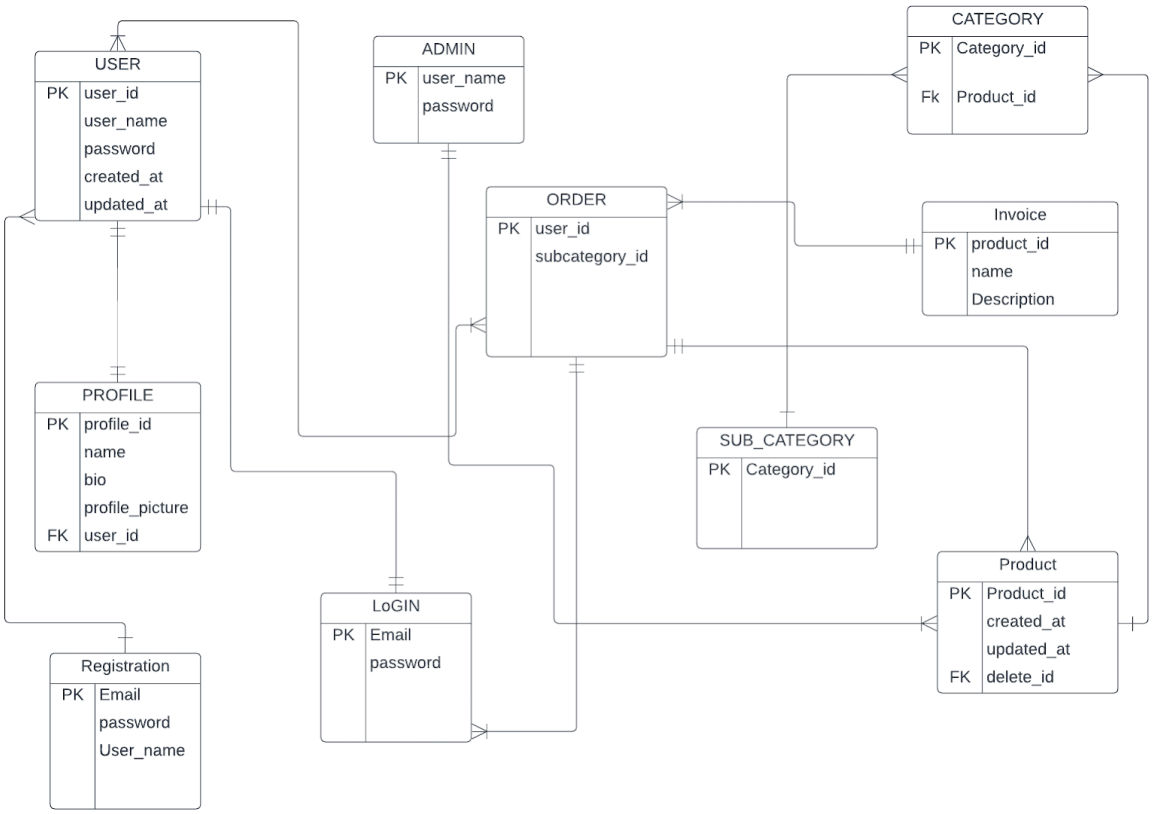


Figure5.4.1.1 Entity Relationship Diagram

Use Case Diagram:

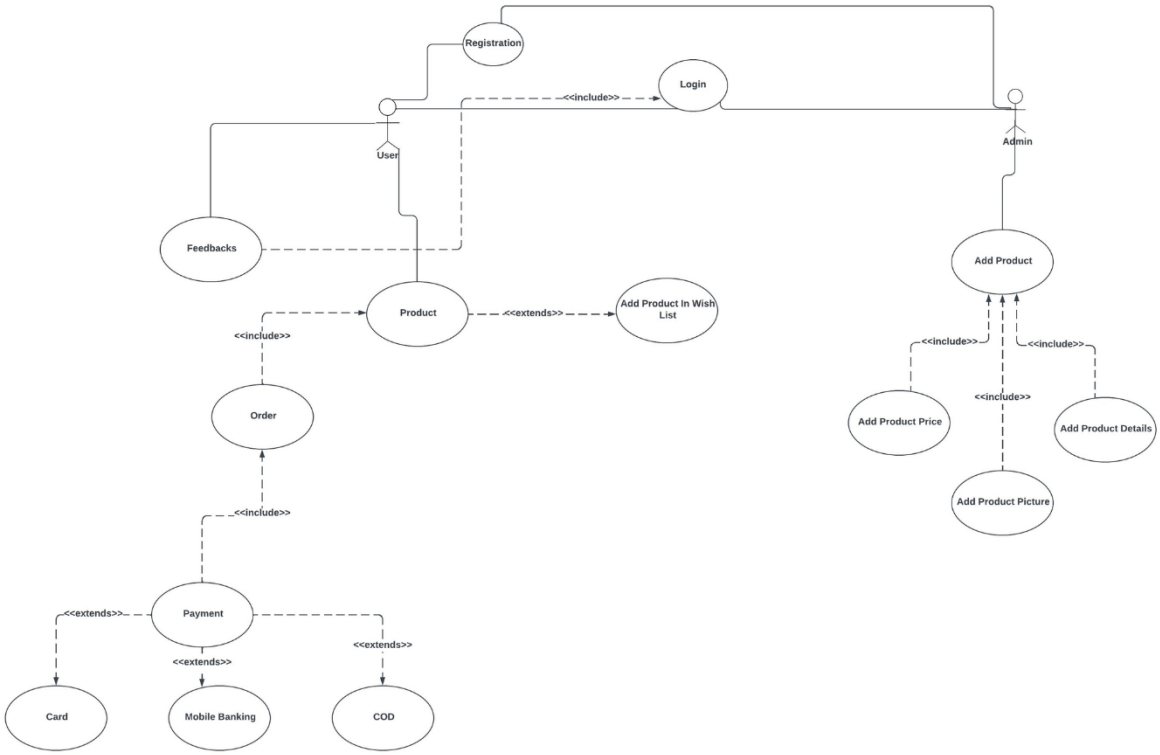


Figure5.4.1.2 Use Case Diagram FOR Admin, Customer

Activity Diagram:

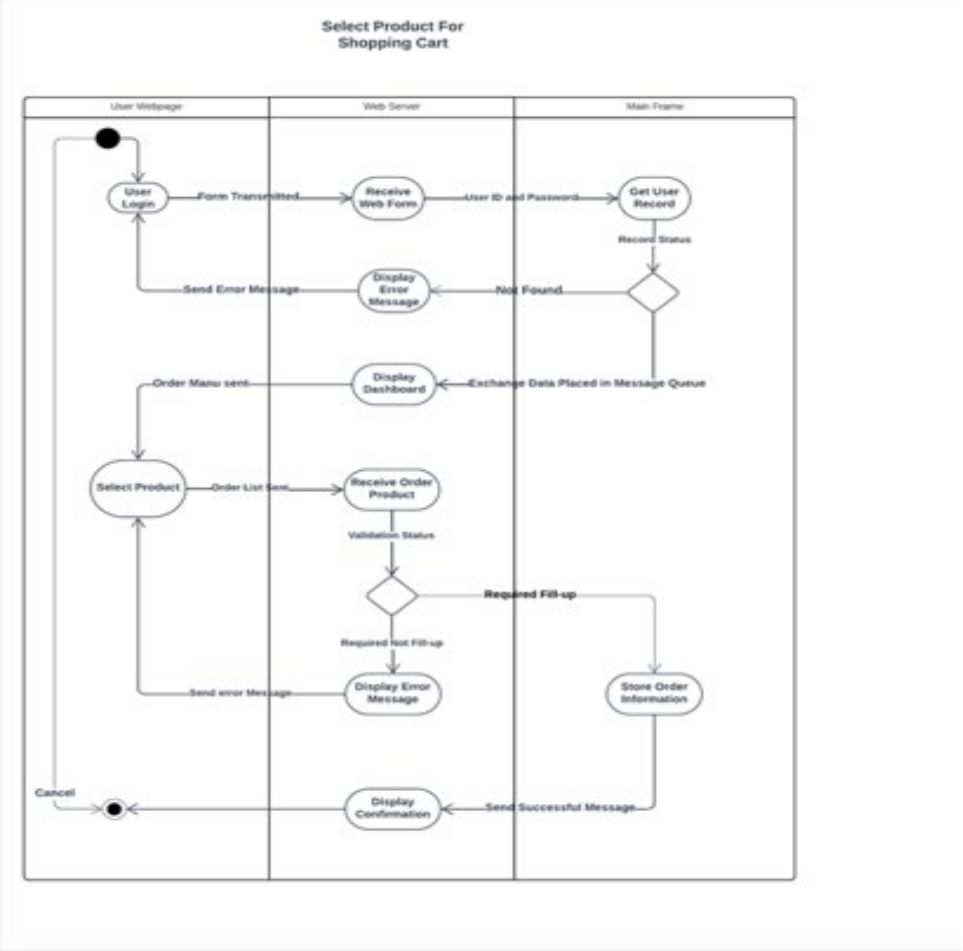


Figure5.4.1.3 Select Product for Shopping Cart Activity Diagram

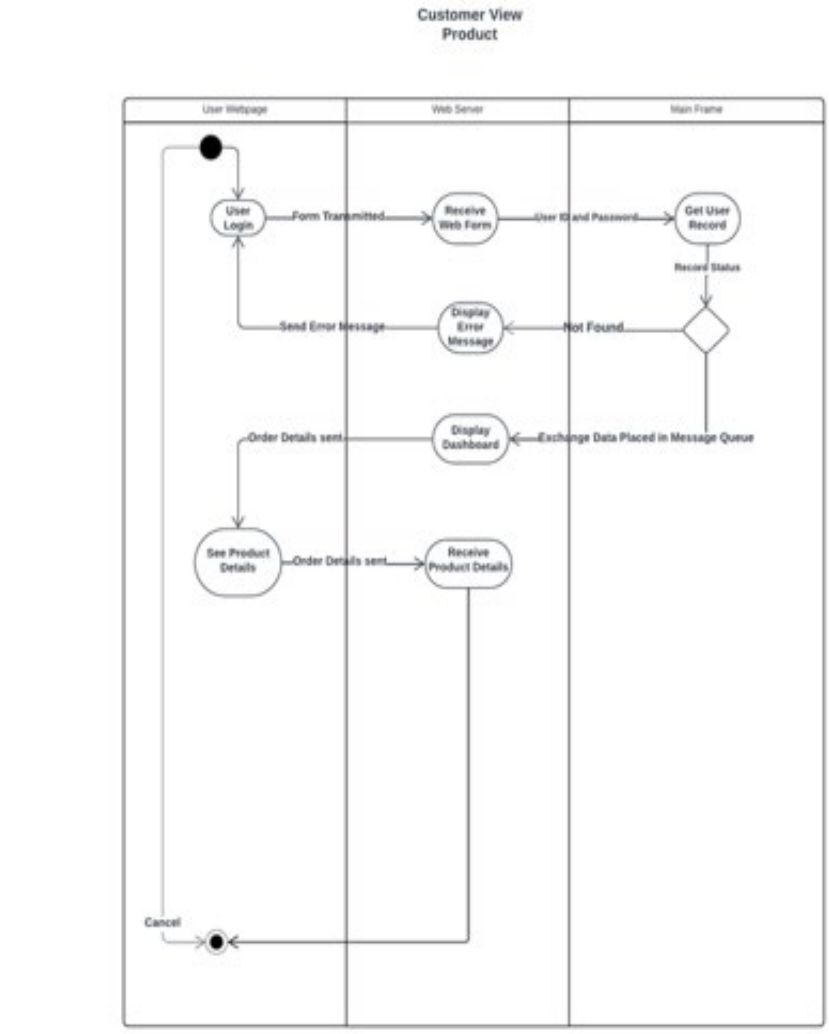


Figure5.4.1.4 customer view Product Activity Diagram

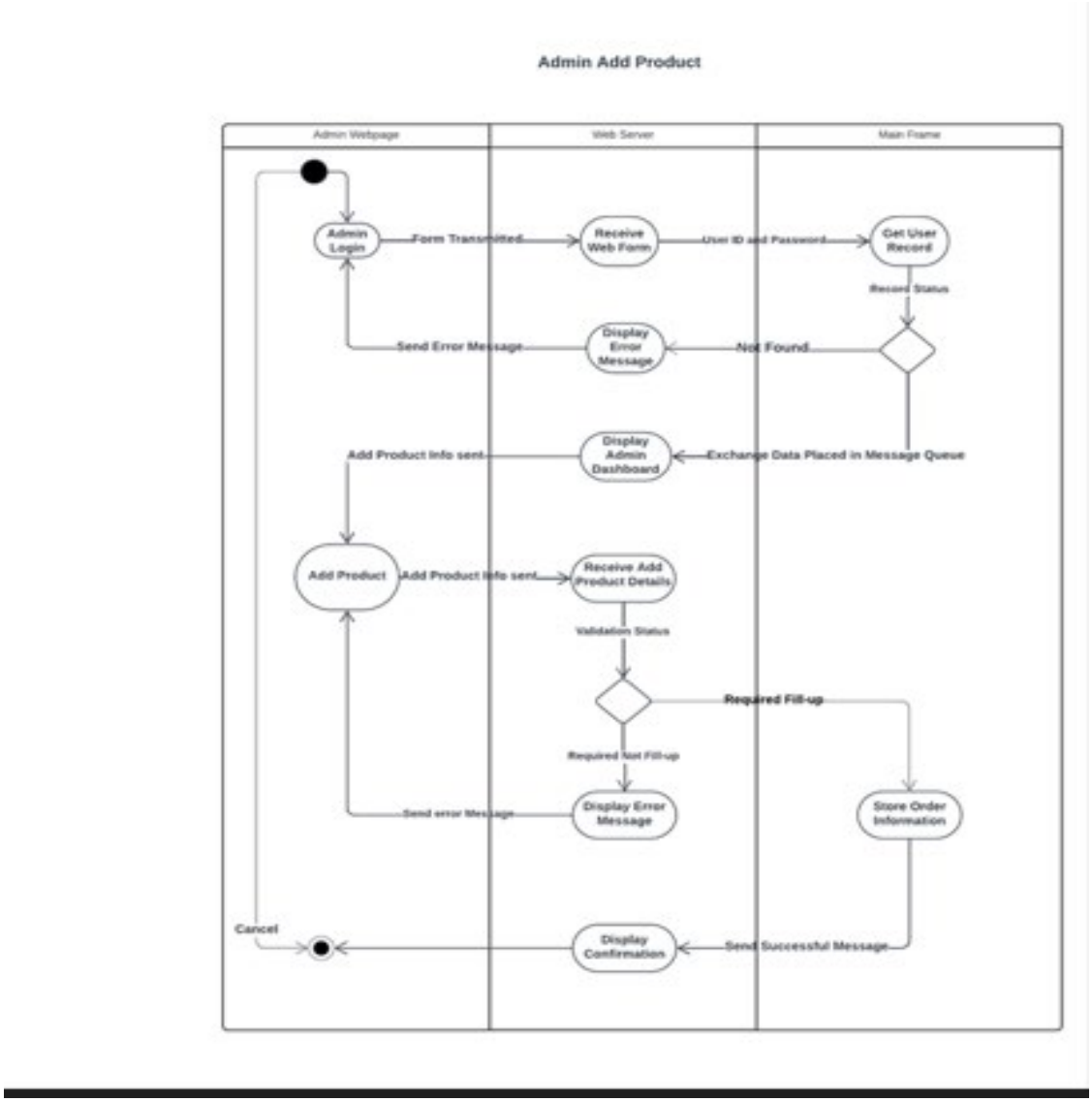


Figure5.4.1.5 Admin add product Activity Diagram

5.4.2 Architecture

Model-View-Controller, or MVC, is a design pattern that is frequently used in software development, especially when building web applications. MVC is widely used in web development frameworks like Ruby on Rails, Django (Python), Laravel (PHP), and Angular (JavaScript/Typescript) to structure web applications and ensure code organization and maintainability. Here is a quick description of each element:

1. Model.
2. View.
3. Controller

Model:

- Represents the data and business logic of the application.
- Includes rules for data manipulation as well as data and database interactions.

- Independent of the user interface, responsible for managing, storing, and retrieving data.

View:

- Takes care of the user's data display and rendering.
- Shows the components of the user interface, such as web pages, forms, or user interface elements.
- Displays data that was taken from the Model.
- Pays attention to the presentation of data rather than its processing or manipulation.

Controller:

- Serves as a bridge between the View and the Model.
- Receives user input and controls the logic and flow of the application.
- Receives user requests, processes them, and decides how to respond in the program.
- Updates the View and the Model in response to user interactions.

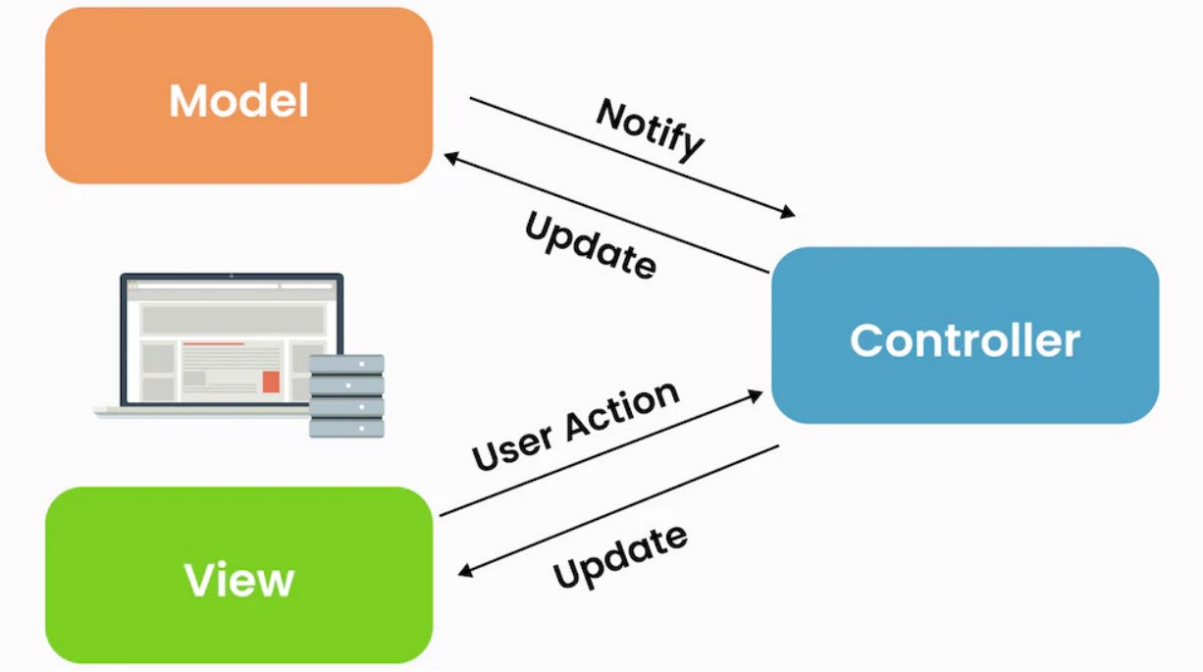


Fig: 5.4.2 MVC

5.5 Implementation

The implementation portion of Bongo is mostly concerned with the technical elements of designing and executing the system. It involves transforming the requirements and design into a workable and beneficial software solution. a few examples of screenshots:

Frontend:

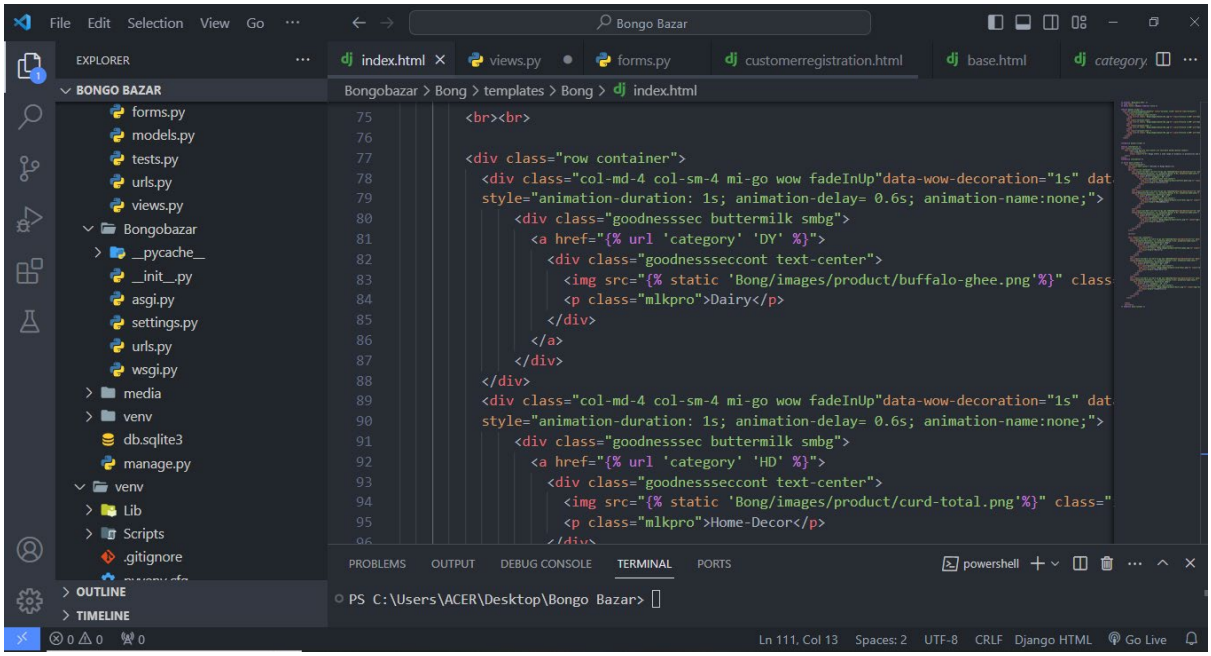


Figure5.5.1Programing screenshot

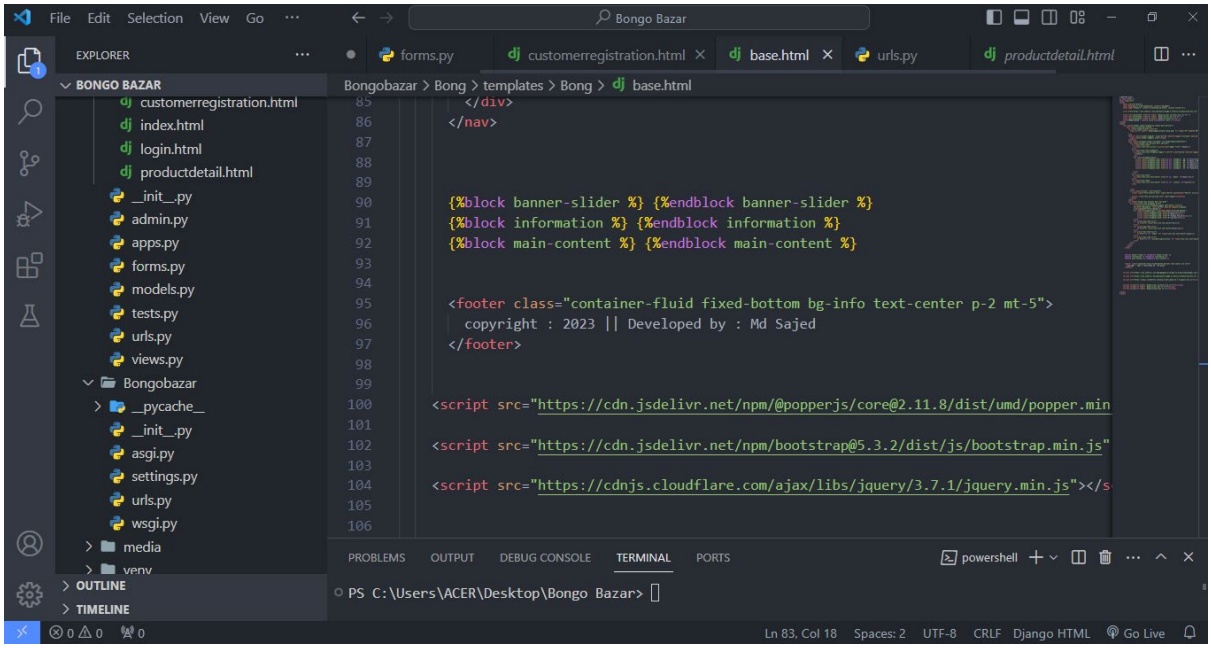


Figure5.5.2Programing screenshot

Backend:

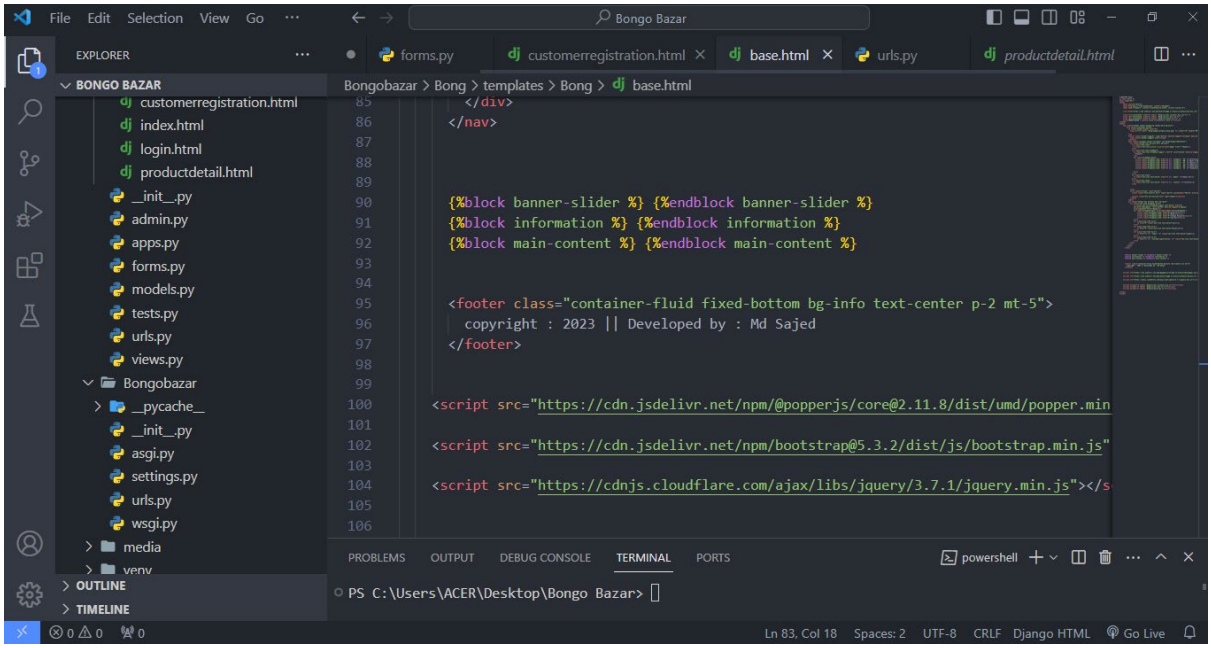


Figure5.5.3Programing screenshot

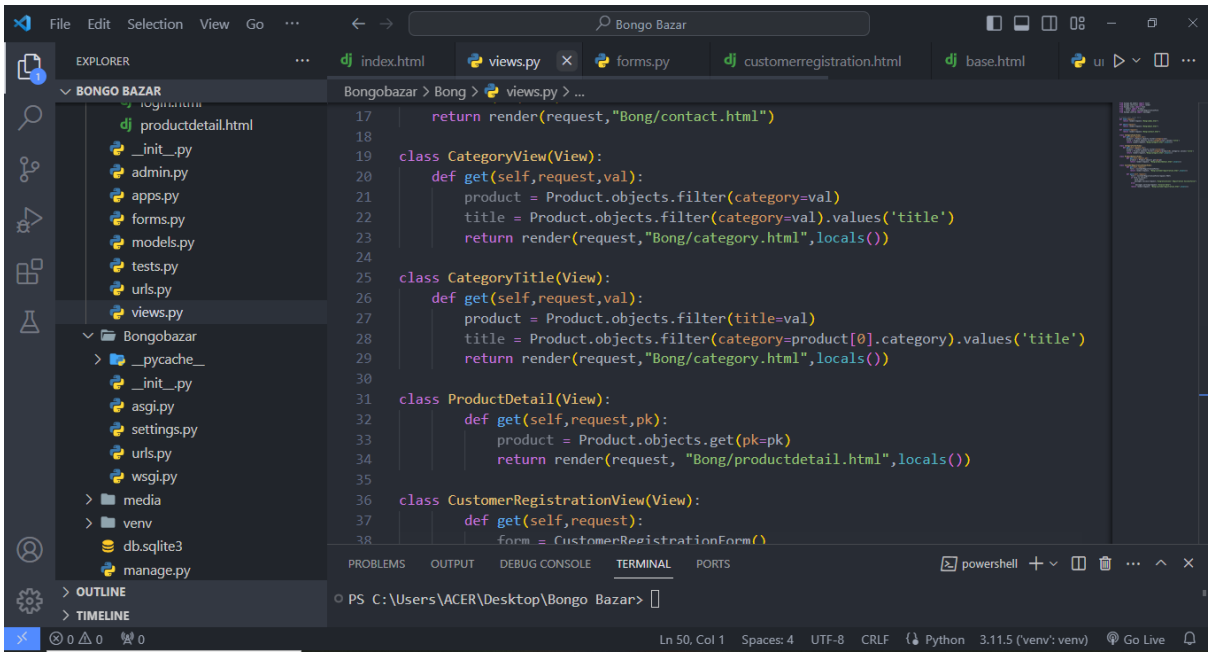


Figure5.5.4Programing screenshot

5.6 Testing

A critical stage in the Bongo platform's development is testing. It guarantees that the system performs as expected, complies with the criteria, and provides an excellent user experience. The Bongo platform's testing strategy includes a variety of stages and sorts of testing to comprehensively check its usability, performance, safekeeping, and functionality.

5.6.1 Input

Test Case ID	Test Scenarios	Test Input
TC001	User Registration	User Details (Name, Email , Password)
TC002	User Login	User Credentials (Email, Password)
TC003	Add To Cart	Product ID, Quantity
TC004	Wish List	Product Id, Product Name
TC005	Place Order	Cart Items , Shipping Details , Payment Information
TC006	Update Profile Information	User Id, Updated Information (Email, Name, Address ETC)
TC007	Admin Login	Admin Credentials (Email, Password)
TC008	View Order History	User ID

Table 5.6.1 Input table with Field

5.6.2 Output

Test Case ID	Test Scenarios	Test Output
TC001	User Registration	Registration Successful!
TC002	User Login	Successful Login & User Dashboard
TC003	Add To Cart	Product Added To The Cart
TC004	Wish List	Product Added To The Wish List

TC005	Place Order	Error: Invalid User Information
TC006	Update Profile Information	Profile Update Conformation
TC007	Admin Login	Successful Login
TC008	View Order History	List Of Previous Orders

Table 5.6.2 Output table with Field

5.6.3 Designing Test Cases

Test Case ID	Test Scenarios	Test Input	Test Output	Pass/Fail
TC001	User Registration	User Details (Name, Email , Password)	Registration Successful!	Pass
TC002	User Login	User Credentials (Email, Password)	Successful Login & User Dashboard	Pass
TC003	Add To Cart	Product ID, Quantity	Product Added To The Cart	Pass
TC004	Wish List	Product Id, Product Name	Product Added To The Wish List	Pass
TC005	Place Order	Cart Items , Shipping Details , Payment Information	Error: Invalid User Information	Fail
TC006	Update Profile Information	User Id, Updated Information (Email, Name, Address	Profile Update Conformation Message!	Pass

		ETC)		
TC007	Admin Login	Admin Credentials (Email, Password)	Successful Login	Pass
TC008	View Order History	User ID	List Of Previous Orders	Pass

Table 5.6.3 Designing Test case Input/output Pass/Fail table

5.6.4 Test Results

Most test cases have been found to be successful when examining the test results table since the actual and expected results are in agreement. The failure of one test case (TC004) was caused by the fact that the actual output, "Error: Invalid user information," did not correspond to the anticipated output, "Order placed successfully." Here,

- Each test case has a specific identification number, or test case ID.
- Expected Output: This explains what should happen when the test case is executed in terms of the expected outcome or behavior.
- **Actual Output:** This reflects the outcome or conduct that was actually seen during testing.
- **Pass/Fail:** Determining whether the real result aligns with the expected result is essential. The definite outcome contests the anticipated one, the test instance is deemed successful. However, if the real output doesn't correspond with the expected outcome, the test case is designated as "Fail."

Chapter 6-Results & Analysis

Results & Analysis portion is a crucial stage where the project's outcomes are evaluated, its performance in comparison to goals is assessed, and suggestions for improvement are given. A thorough investigation follows:

Functional Outcomes: The project met its main goals by producing an e-commerce platform that is fully operational. Users had the option to sign up, browse products, put items in their shopping carts, and securely finish transactions. Orders were completed quickly, and suppliers could list and control their goods.

Security and Reliability: Strict testing and security precautions guaranteed the platform's security and dependability. Strong encryption preserved payment data, while user authentication measures protected user accounts. To keep the platform reliable, uptime and responsiveness were tracked.

User Engagement: User engagement metrics, such as user registration rates, product views, and conversion rates, were analyzed. Insights from user interactions guided future feature development and marketing strategies.

Feedback Analysis: User feedback collected during the testing phase and initial launch was scrutinized. Common user pain points and suggestions for improvements were identified and prioritized for future iterations.

Performance Metrics: Performance metrics, including page load times, server response times, and database query performance, were monitored. Any performance bottlenecks were addressed to ensure optimal user experience.

Chapter 7-Project as Engineering Problem Analysis

The project's broader ramifications and considerations are covered in this section. This e-commerce marketplace development project displays a multifaceted set of difficulties and factors when seen as an engineering problem, going much beyond standard code and design. It serves as an example of an extensive engineering project where technical expertise is combined with creativity, user-centric design, and ethical responsibility.

7.1 Sustainability of the Project/Work

Scalability: The platform's capacity to handle growing user and product listings was evaluated. To accommodate potential growth, scalability measures like load balancing and database optimization were put in place.

Environmental Impact: Measures were taken to lessen the project's impact on the environment. To cut back on energy use, options for server hosting, energy-efficient hardware, and resource optimization were investigated.

7.2 Social and Environmental Effects and Analysis

influence on Society: The project's influence on society was evaluated in terms of job creation, vendor empowerment, and user access to a wide variety of goods. There have been initiatives to advance accessibility and diversity.

Environmental Impact: Particularly in relation to product shipping and packaging, the environmental impact was assessed. To lessen damage to the environment, eco-friendly shipping methods and sustainable packaging choices were investigated.

7.3 Addressing Ethics and Ethical Issues

Data Security: Strict data security procedures were put in place to safeguard user information. Transparency and adherence to data protection laws were guaranteed by clear privacy policies and data handling procedures.

Fair Trade and Ethical Practices: Fair trade practices, product sourcing transparency, and adherence to ethical production standards were taken into account when forming vendor agreements. Vendors were urged to support moral and environmentally friendly business practices.

User Trust: It was crucial to keep users' trust. Transparent pricing, honest product descriptions, and attentive customer service that addresses user concerns were all examples of ethical business practices.

Chapter 8 Lesson Learned

8.1 Problems Faced During this Period

Scope Creep: As additional feature requests surfaced throughout development, managing scope creep was difficult. To deal with this problem, scope control measures were put in place, including strong change request procedures.

Resource Allocation: A constant worry was the efficient use of resources, particularly personnel. Tools for managing resources were used, along with routine resource assessments, to guarantee effective allocation.

Testing Challenges: Complex testing requirements called for careful planning and execution, such as the development of thorough test cases and coordination of user acceptability testing.

8.2 Solution of those Problems

Scope Management: Before making changes, a formal change control procedure was built to seek stakeholder permission and assess the impact of scope modifications. This kept the project's focus.

Resource optimization: Resources were continuously assessed and modified to meet project requirements. Team members' regular interaction and cooperation ensured effective resource management.

Testing Efficiency: Through the use of automated testing frameworks, test case management software, and coordinated user acceptability testing, testing efficiency was increased. To increase efficacy and test coverage, testing procedures were shortened.

Chapter 9 Future Work & Conclusion

9.1 Future Works

Enhanced Personalization: Future development may provide sophisticated user customization features like AI-driven recommendations and specialized content delivery.

Internationalization: Localizing the language, switching the currency, and abiding with international regulations are all examples of internationalization, which aims to make the platform more accessible to users around the world.

Mobile commerce: The mobile shopping experience could be enhanced by creating apps that are optimized for mobile devices or by enhancing responsive designs.

9.2 Conclusion

My outlook on software development has definitely changed as a result of my stay at Divine IT Limited. I was instrumental in developing an e-commerce site using Django during my internship, which not only helped me learn useful skills but also exposed me to the challenges of real-world software development. The success of our project was greatly influenced by adopting agile methodology, conducting thorough testing, and working with seasoned experts. I'm looking forward to working at Divine IT Limited in the future and making a difference in the development of cutting-edge software solutions. I'm incredibly appreciative of all the help and advice I've gotten throughout this amazing trip.

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An Undergraduate Internship/Project on Topic

Bongo & Online Shopping System

By

Md Sajed

Student ID: **1910566**

Summer, 2023

Consent from Supervisor

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