Global Journal of Engineering and Technology Advances
eISSN: 2582-5003
Cross Ref DOI: 10.30574/gjeta
Journal homepage: https://gjeta.com/

(RESEARCH ARTICLE)

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Design and implementation of an E-commerce market place

Akande Oyebola [1,*], Adegbola Adesoji [2], Uzoma-Ezeuli Chukwuemeka Chinecherem [2], Fadahunsi Timi Omotola [2], George Biobele Bright [2] and Adewuyi Joseph Oluwaseyi [3]

[1] *Department of Computer Science, School of Computing, Babcock University of Technology, Ogun State, Nigeria.*
[2] *Department of Software Engineering, School of Computing, Babcock University of Technology, Ogun State, Nigeria.*
[3] *Department of Information Technology, School of Computing, Babcock University of Technology, Ogun State, Nigeria.*

Global Journal of Engineering and Technology Advances, 2024, 20(03), 171–187

Publication history: Received on 13 August 2024; revised on 25 September 2024; accepted on 28 September 2024

Article DOI: https://doi.org/10.30574/gjeta.2024.20.3.0188

Abstract

Many small businesses and start-ups are faced with the challenge of promoting their business awareness to increase their profit margin. But many of these small businesses and start-ups cannot pay for domain registration and building of a functional website of their own. Thus, e-commerce application which can be a platform for many businesses is a good solution to this. It serves as incentive for revenue generation and business expansion in addition to promoting consumer interaction, entrepreneurship, and the growth of small businesses. Therefore, this paper aimed at design and implementation of an e-commerce application for tailors. The e-commerce system can protect sensitive customer data and secure online payment system which can serve as a platform for many businesses and start-up. This will promote business awareness, give ability to reach more customers and then improve owners profit margin. This project aims to harness the power of e-commerce marketplaces to create a tailored shopping experience for a specific target audience.

Keywords: E-commerce; Small Business; Marketplace; Customer

1. Introduction

E-commerce means electronic commerce; it means trading pf products or services using the platform of the Internet through computer networks (computer networks or mobile networks). Other technologies such as electronic data interchange (EDI) and electronic fund transfer (EFT) made this possible. EDI allows businesses to interchange business information electronically (Ram611 O'Callaghan and Jon A. Turner), while EFT allows money to electronically flow from one bank to another. EDI is strictly done computer to computer. Internet protocols such as hypertext transfer protocol (HTTP) and digital subscriber line (DSL) in 1998 provided a secure platform for e-commerce (Dhanyakumar Kurmude, Pradip Paithane, and Sangeeta Kakarwal, 2019).

Historically, Advanced Research Projects Agency (ARPANET) in 1972 used packet switching network and implementing transmission control protocol/internet protocol TCP/IP protocol for cannabis sale between students from Standford Artificial Intelligence Laboratory and Massachusetts Institute of Technology (MIT). In 1979 Teleputer was invented by a British entrepreneur called Michael Aldric. Teleputer was used by to enable transaction between business and computers (B2C) and business to business (B2B). Boston Computer Exchange (BCX) in 1982 was the first e-commerce company for buying and selling of computer equipment online. This was followed by Amazon in 1994 when Amazon started by selling books online. Other online shopping website are: Books Stacks Unlimited in 1992 (by Charles M.Stack) and Internet Shopping Network in 1994 (by Dan Kohn), eBay founded by Pierre Omidyar in 1995.

* Corresponding author: Akande Oyebola.

Some e-commerce platforms are specific in what they sell but others sell a wide variety of products and services. This focused on e-commerce for fashion industry or simply called, tailor. The accessibility of e-commerce marketplaces is particularly empowering for consumers with limited mobility or those residing in remote areas. The ability to browse products, compare prices, and make purchases from anywhere with an internet connection has revolutionized the way people shop, breaking down barriers and opening new avenues for consumerism. Different methodologies such as waterfall and Agile have been used over the years. The following sections discussed related works, methodology, implementation and results, and system testing.

2. Related Work

(Jaya, 2023) developed a web-based furniture sales system for Teak Megah Furniture. Previously, marketing was done by the company by offering good directly to consumers through word of mouth or social media, there was poor access to goods data such as sales reports, list of ordered goods and goods availability and unless customers appear physically, they cannot buy goods. System analysis was performed firstly by drawing a data flow diagram (DFD) up to level two. After this entity relationship diagram (ERD) was drawn. The drawing of DFD and ERD is towards the building of the system database. The interface design was done so that users may connect to the database. The web application is not a mobile application, it can only work on desktop.

(Fernando, 2023) used waterfall model to develop a platform for footwears makers to showcase and sell their products. Waterfall model was used because of its advantage of finishing up a developmental stage before moving to the another one. It also integrates secure gateway platform.

(Aulia Jannah, Adila Mawadda Meuraxa, Azzahrah, 2023) also developed a web-based e-commerce system using waterfall model. The researchers found that e-commerce applications that run on Google Chrome and Mozilla Firefox are more efficient than others. The web application interface was designed with Hypertext Preprocessor (PHP), HyperText Markup Language (HTML), Cascading Style Sheets (CSS) on Notepad. The database used was My-SQL(Structure query language) accessed via Cross-Platform, Apache, MySQL, PHP, and Perl (XAMPP). Reporting and controlling of inventory data is easier to do since it can be automatically automated. Marketing also reaches more audience and this increases sales.

3. Methodology

This process will involve identifying target audience, eliciting requirements, conceptual design, detailed design, usability testing, and implementation and testing.

3.1. Identifying target audience:

- Potential customers
- Existing customers
- Business partners
- Administrators

3.2. Eliciting requirements from target audience

Requirement elicitation is the process of gathering and analyzing information about the needs and expectations of stakeholders for a software system. It is a crucial step in the software development process, as it ensures that the system is designed and built to meet the real needs of its users. There are a number of different techniques that can be used for requirement elicitation. Some of the most common techniques include: Interviews, workshop and survey. Survey in form of questionnaire was used here. Surveys was used to gather quantitative data on user preferences and expectations. This is a great way to get feedback from a large number of users and to identify common trends.

3.3. Core Requirements

Requirements gathered are divided into user and system requirements.

3.4. User Requirements

User requirements are the expectation of the user from the proposed system. These requirements should be written from the user's perspective and should be clear, concise, and unambiguous. For example:

- CUSTOMERS (potential and existing customers)
- Customers shall be able to browse products and services.
- Customers shall be able to add products and services to their shopping orders.
- Customers shall be able to checkout and purchase products and services.
- Customers shall be able to track their orders.
- Customers shall be able to manage their account information.
- Customers shall be able to connect with the fashion designers
- Customers shall be able to interact with the works of other designers
- Customers shall be able to interact with the various fashion designers

3.4.1. Fashion designer

- Fashion designers shall be able to upload their works to the web application
- Fashion designers shall be able to keep track of their customers
- Fashion designers shall be able to monitor the order list of their customers
- Fashion designers shall be able to interact with the works of other fashion designers
- Fashion designers shall be able to connect with other fashion designers
- Fashion designers shall be able to track the orders of customers.
- Fashion designers shall be able to update their account information

3.4.2. System Requirements

System requirements define the functional and non-functional requirements.

3.4.3. Functional requirements

The functional requirements are behaviours the system should do or support. The behaviours are expressed with input and output, which is the description of the behaviour itself. Requirement elicitation and functional requirements are essential for the success of any software development project. By carefully gathering and analyzing requirements, developers can ensure that the system they build is useful, usable, and meets the needs of its users.

For example

- *Input: customer clicking shopping cart*
- *Output: all products added should be displayed on shopping cart*

3.4.4. Non-Functional Requirements

System requirements define the essential characteristics and capabilities that the e-commerce marketplace must possess to fulfill its intended purpose and meet the needs of its users. These requirements focus on the overall performance, security, software tools, hardware requirements and accessibility of the system.

3.4.5. Scalability

The e-commerce marketplace must be designed to handle a growing user base and increasing transaction volume without compromising performance or user experience. Scalability that can be implemented are:

- Horizontal scaling: Adding more servers or computing resources to distribute the workload across multiple nodes.
- Vertical scaling: Upgrading the hardware capabilities of existing servers to increase their processing power and memory capacity.
- Load balancing: Distributing incoming traffic among multiple servers to prevent any single server from becoming overloaded.

3.4.6. Security

Security is paramount in an e-commerce marketplace, as it deals with sensitive user data, financial transactions, and confidential business information. Robust security measures must be implemented to protect against unauthorized access, data breaches, and cyberattacks. These security measures were included:

- Authentication and authorization: Implementing strong authentication mechanisms to verify user identities and enforce access controls based on user roles and permissions.
- Data encryption: Encrypting sensitive data, such as user passwords, credit card numbers, and personal information, to prevent unauthorized access in case of data breaches.
- Vulnerability management: Regularly scanning the system for vulnerabilities and implementing timely patches to address security weaknesses.
- Secure coding practices: Employing secure coding practices to prevent common programming errors that can introduce security loopholes.

3.4.7. Secure payment processing

- Payment gateway integration: Integration with secure payment gateways that adhere to industry standards for data security and encryption.
- Tokenization: Tokenization of sensitive cardholder data, replacing the actual card information with a randomly generated token for secure storage and processing.
- Fraud prevention: Fraud prevention mechanisms to detect and prevent fraudulent transactions, such as real-time transaction monitoring and anomaly detection.
- Data encryption: Encryption of all sensitive data transmitted between the user's device and the marketplace's servers.
- Software tools needed for the e-commerce marketplace project encompass the programming language, UI toolkit, cloud platform etc. These requirements ensure that the marketplace functions seamlessly across various devices and platforms while meeting performance, security, and scalability standards. These are the software tools needed to achieve quality application.

3.5. Programming Language

3.5.1. JavaScript

JavaScript is a versatile and widely used programming language primarily known for its use in web development. Initially created to make web pages more interactive, it has evolved to become a foundational technology in modern web development and is now used for a wide range of applications beyond the web.

3.5.2. Python

Python is a high-level, versatile programming language known for its simplicity, readability, and ease of learning. It was created by Guido van Rossum and first released in 1991. Python's design philosophy emphasizes code readability and productivity, making it a popular choice for beginners and experienced developers alike.

3.5.3. User Interface (UI) Toolkit

CSS (Cascading Style Sheet)

CSS is a fundamental technology used for describing the presentation of web pages, including their layout, colors, fonts, and other visual aspects. It's not a toolkit per se but a language used to style the elements of a web page. CSS provides the styling instructions for HTML elements and is crucial in defining the visual appearance and layout of a website or web application's user interface.

Bootstrap

Bootstrap is a popular front-end framework that relies on HTML, CSS, and JavaScript to aid in the development of responsive and mobile-first web projects. It includes a collection of pre-built CSS and JavaScript components, such as buttons, forms, navigation bars, and more, along with a grid system and other utilities. Bootstrap simplifies and speeds up the process of creating a consistent and visually appealing UI by providing ready-made components and styles that can be easily customized and integrated into web projects.

Database Management System: Mongo DB

MongoDB is a popular, open-source, NoSQL (Not Only SQL) database management system. It is designed to handle large volumes of data and is known for its flexibility, scalability, and ease of use. MongoDB stores data in a flexible, document-based model known as BSON (Binary JSON), which is a binary-encoded serialization of JSON-like documents.

Hardware Requirements

The e-commerce marketplace should function smoothly on a range of devices with varying hardware specifications, ensuring accessibility for a wide range of users. Key hardware considerations include:

- Processor: The application should be optimized for different processor speeds and architectures to ensure smooth performance on various devices. This may involve implementing code that adapts to different processor capabilities.
- Memory: The application should have a reasonable memory footprint to accommodate devices with limited RAM. Efficient memory management techniques, such as garbage collection and memory leaks prevention, are crucial.
- Storage: The application should have efficient storage management to ensure it doesn't consume excessive storage space, especially on devices with limited internal storage. Data caching strategies and optimization of image sizes can help minimize storage usage.
- Network: The application should be able to function seamlessly on different network conditions, including 2G, 3G, 4G, and Wi-Fi. Adaptive networking techniques, such as adjusting data transfer rates based on network availability, can ensure a consistent user experience.

By carefully considering these technological and software requirements, the e-commerce marketplace will be developed on a solid foundation, ensuring compatibility, performance, security, and scalability across a wide range of devices and platforms.

3.6. System design: this includes: user stories, use case diagrams and sequence diagram.

3.6.1. Use Case Diagram

A use case diagram is a fundamental tool in software development that visually depicts the interactions between users and the system. It serves as a valuable communication medium among stakeholders, facilitating a shared understanding of the system's functionality and user roles. Within the context of an e-commerce marketplace, the use case diagram plays a crucial role in defining the system's behavior from the perspective of its users. It identifies the primary actors, which represent different user roles, and the use cases, which encapsulate the actions or interactions that users perform within the system. The use case diagram serves as a foundational document in the design phase of the e-commerce marketplace, providing a clear understanding of the system's functionality and user interactions. It facilitates collaboration among stakeholders, ensuring that the system aligns with their expectations and meets the needs of its users.

Use Case for Customers

Customers are essential contributors to the e-commerce marketplace, handling various tasks that ensure smooth operation and customer satisfaction. The use case in figure below illustrates the customer's and fashion designer interactions with the system:

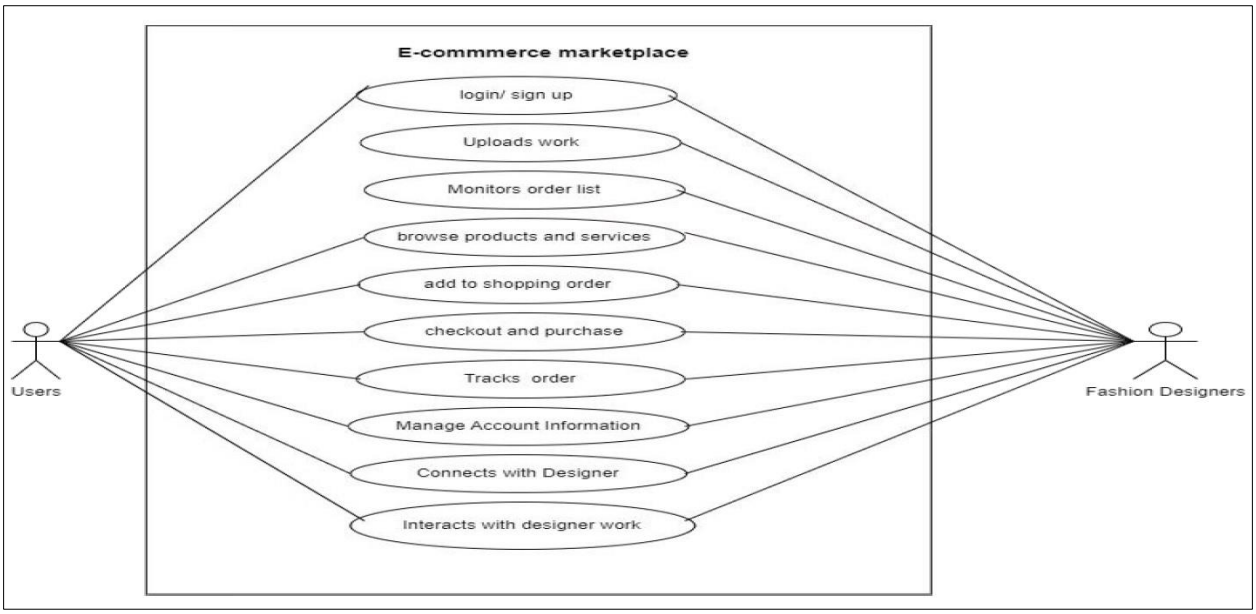

Figure 1 Use Case Diagram for an E-commerce Marketplace

Actors: customer/user and fashion designer

- Browse Products and Services: This includes filtering, searching, and viewing details of the products and services.
- Add to Shopping Order: Customers can select products or services and add them to a virtual shopping order or cart.
- Checkout and Purchase: This use case involves the process of finalizing the order and proceeding with the purchase, which includes providing payment and shipping information.
- Track Orders: Post-purchase, customers can track the status of their orders, such as processing, shipping, and delivery times.
- Manage Account Information: Customers can manage their personal and payment information, preferences, and other account settings.
- Connect with Fashion Designers: This feature allows customers to connect or get in touch with fashion designers directly, possibly for custom orders or queries.
- Interact with Fashion Designers' Work: Customers can interact with the works of fashion designers, which may include providing feedback, ratings, or sharing on social media.

Use cases for Fashion Designer

- Upload Works: Fashion designers can upload images or descriptions of their designs and products onto the platform.
- Track Customer Orders: Designers can track the orders made by customers for their products, monitoring the status and processing of these orders.
- Monitor Order List: This use case involves overseeing the list of orders received for their products, which helps in inventory and demand management.
- Interact with other Fashion Designers: Designers can interact with each other, possibly for collaborations, sharing insights, or discussing trends.
- Update Account Information: Designers can update their personal and professional information, portfolio, and other relevant details on their profiles.

3.6.2. Sequence Diagram

The sequence diagram portrays the series of actions occurring within the system as users browse through available products. Upon entering their login credentials, the website's backend processes this information by sending a request to the database, which in turn responds based on the validity of the provided data. Once authenticated, users gain access to browse various products, interact with them, add desired items to their shopping cart, and even submit measurements for tailored items.

Furthermore, the diagram elucidates the procedure for verifying the status of products, such as determining availability or identifying items that are out of stock. This verification process involves querying the database to ascertain the current status of each product before allowing users to add them to their cart. By dynamically assessing the availability status, the system ensures that users are presented with accurate information regarding product availability, thus enhancing the overall user experience and minimizing potential frustration caused by attempting to add unavailable items to their cart. In essence, this sequence diagram encapsulates the seamless flow of interactions between users and the system's backend, facilitating a smooth and efficient browsing experience within the e-commerce marketplace.

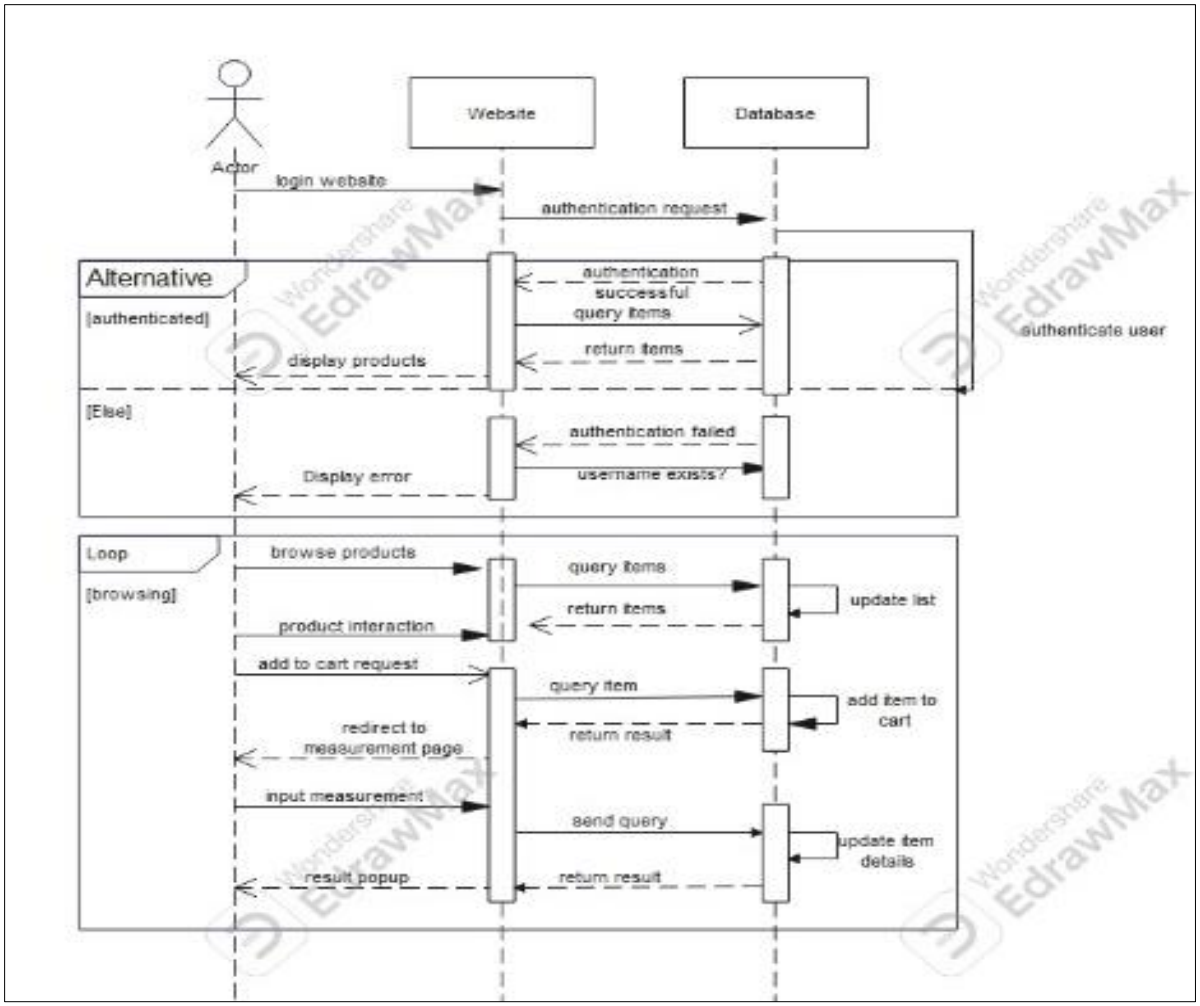

Figure 2 System/User Flow Diagram of an E-commerce marketplace

This user flow diagram effectively illustrates how different components of the system interact to facilitate a smooth and efficient user experience from logging in to tracking their order. The System/User Flow Diagram above provides a comprehensive view of how users interact with the system, detailing the step-by-step process from initial access to order fulfilment. Here's a detailed breakdown based on the provided project documentation:

User Registration/Login:

- Purpose: Allows users to either create a new account or access their existing account.
- Flow:
- User Interaction: Users enter their login credentials or registration details in their web browser.
- System Process:
- The web browser sends this information to the web server.
- The web server forwards the data to the application server.
- The application server queries the database server to verify user credentials or store new account details.

- Based on the response from the database, the application server informs the web server, which then sends the appropriate response (e.g., login success or registration confirmation) back to the user's browser.

Browsing Products:

- Purpose: Users explore and search for products within the platform.
- Flow:
- User Interaction: Users browse through product categories or use the search function on their web browser.
- System Process:
- The web browser sends the browsing or search request to the web server.
- The web server passes this request to the application server.
- The application server retrieves relevant product data from the database server.
- The product information is then sent back from the database server to the application server, to the web server, and finally displayed on the user's browser.

Adding Items to Cart:

- Purpose: Allows users to add selected products to their shopping cart for purchase.
- Flow:
- User Interaction: Users choose products and add them to their cart using their web browser.
- System Process:
- The web browser sends the add-to-cart request to the web server.
- The web server communicates with the application server to update cart information.
- The application server updates the cart data in the database server.
- The updated cart details are then sent back to the user's browser through the web server.

Checkout and Payment:

- Purpose: Users finalize their purchase by entering shipping details and making a payment.
- Flow:
- User Interaction: Users proceed to checkout, input their shipping information, and make a payment through their web browser.
- System Process:
- The web browser sends checkout information to the web server.
- The web server forwards this information to the application server.
- The application server processes the payment by interacting with an external payment gateway (via an external API).
- Order and payment data are recorded in the database server.
- The payment gateway communicates the result back to the application server.
- The application server updates the web server with the payment status, which is then sent back to the user's browser.

Order Confirmation and Tracking:

- Purpose: Users receive confirmation of their order and can track its shipment.
- Flow:
- User Interaction: Users request order confirmation and tracking details via their web browser.
- System Process:
- The web browser sends this request to the web server.
- The web server passes the request to the application server.
- The application server queries an external shipping service via an API to get shipment details.
- The shipping information is sent back through the application server and web server to the user's browser.

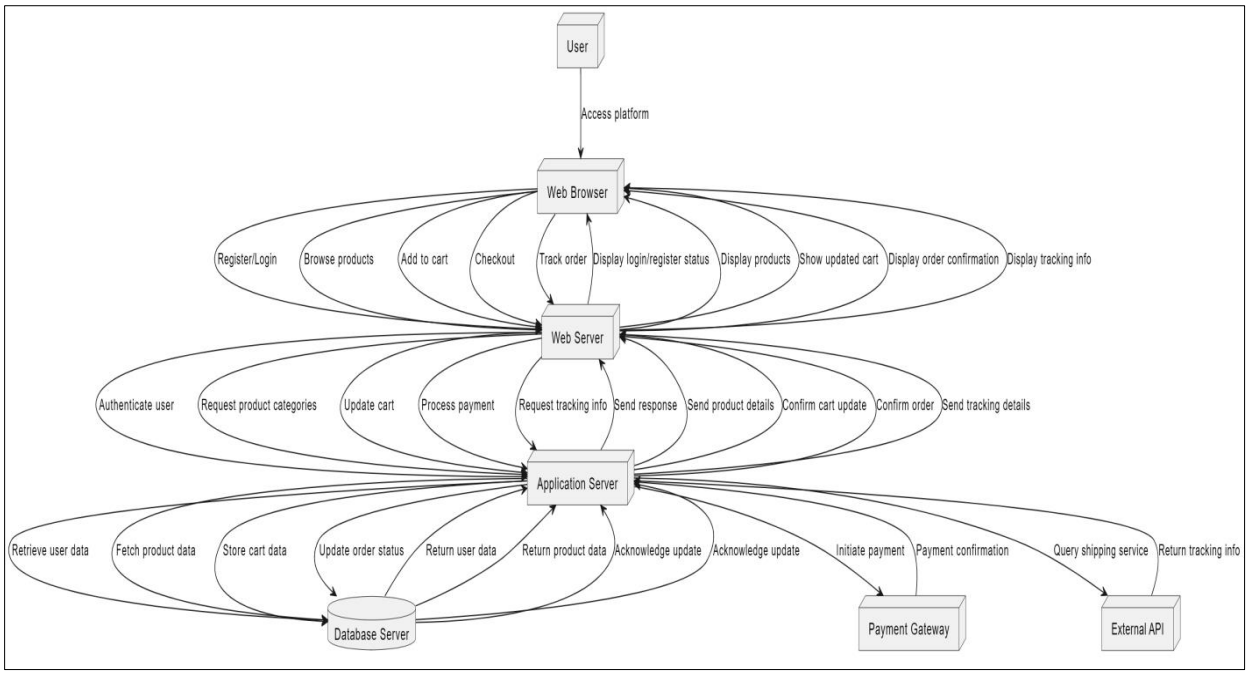

Figure 3 Figure System/User Flow Diagram of an E-commerce marketplace**.**

4. Implementation and Testing

4.1. Web Application Interface

This section shows the graphical representation of the system interface in various modules. The modules include the tailor module and the customer module.

4.1.1. Tailor Module

This consists of the activities of the tailors which involves login, reset password, overviewing the dashboard, managing orders, customer management, networking amongst tailors and customers and managing their personal portfolio or gallery.

Tailor Login Page

This is the page where tailors can login into the application.

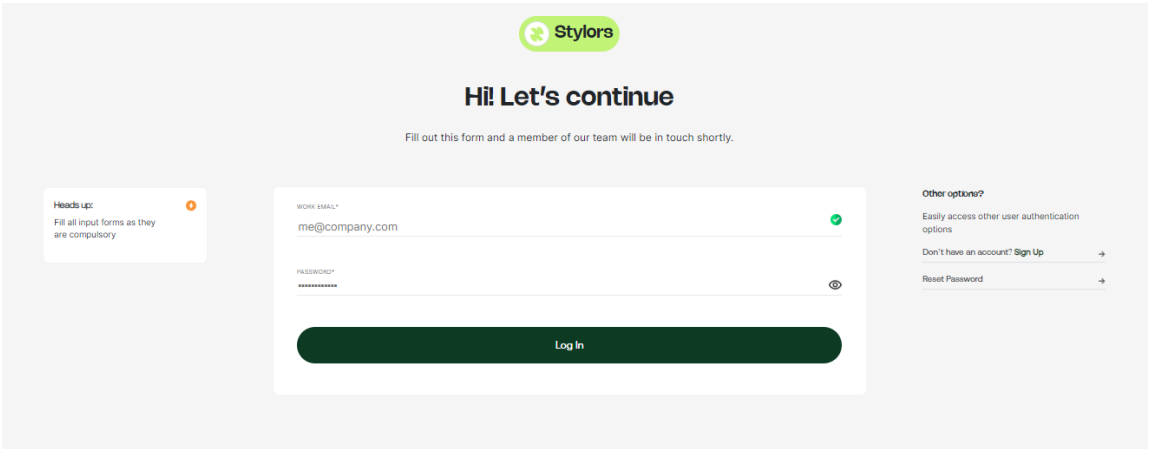

Figure 4 Login Page

Tailor Dashboard Page

It forms the platform's operational and analytical core. This module is designed to offer comprehensive administrative functions, facilitating efficient administration and real-time observation of the system's multiple facets.

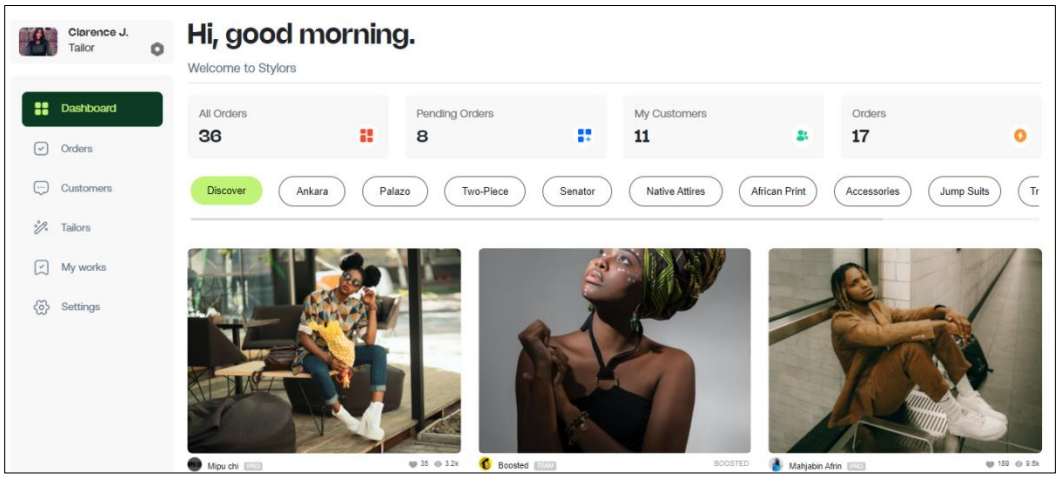

Figure 5 Tailor Dashboard Page

Tailor Orders Page

From order initiation to order completion, this module is carefully developed to manage the complexities of order processing. By incorporating proficient tracking methods, it offers transparent and current status data, improving both operational efficiency and customer satisfaction.

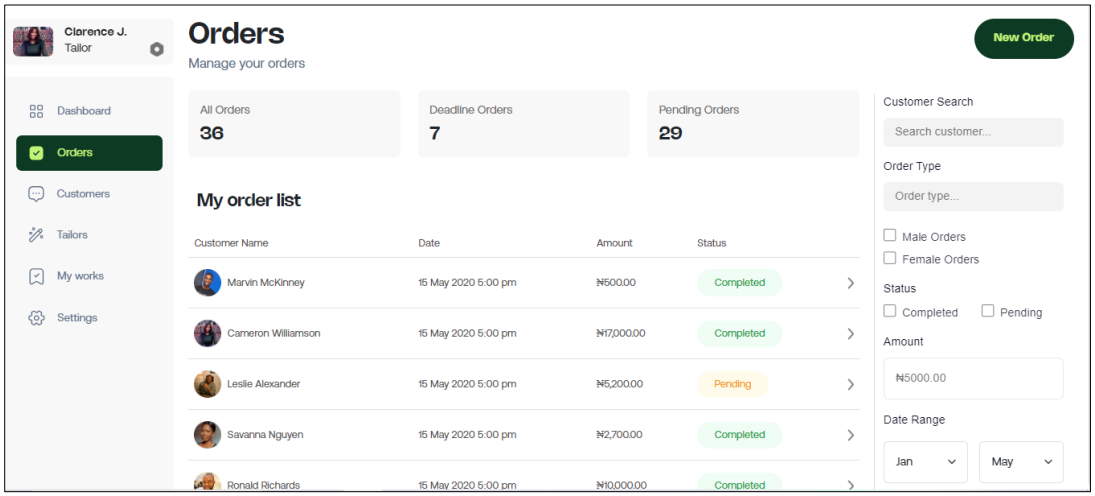

Figure 6 Tailor Order Page

4.2. Customer Communication Interface:

This is focused on building and sustaining strong customer relationships. It is designed to handle client profiles, comprehend their preferences, manage their individual orders, and enable individualised communications. This module plays an important role in ensuring that every user has a customised purchasing experience.

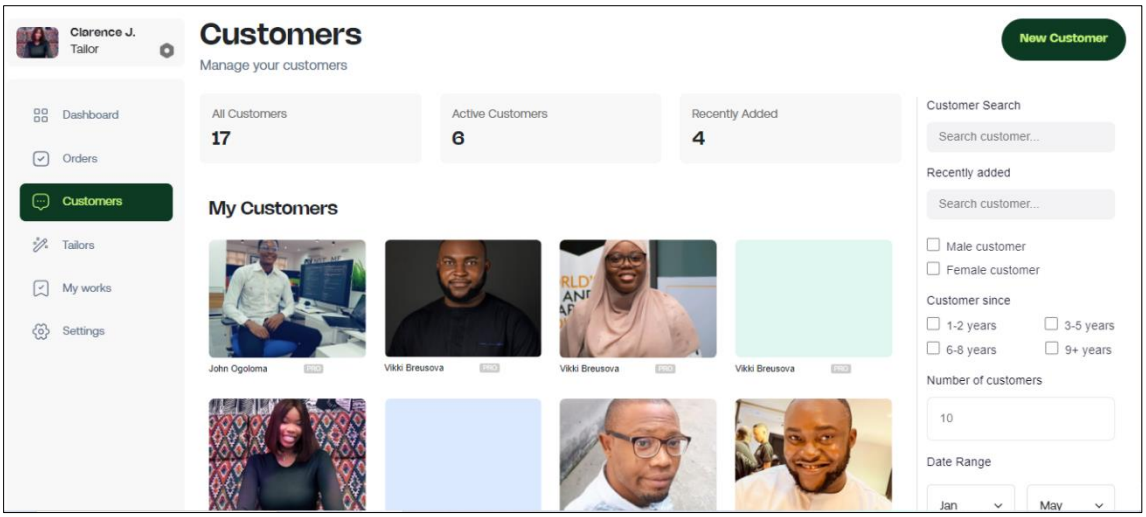

Figure 7 Customer Communication Page

Tailor Interface

This specialized module caters to the unique needs of tailors and designers on the platform. It encompasses functionalities for profile management, order handling, and customer engagement. Moreover, it provides a virtual space for tailors to showcase their portfolios, thus highlighting their craftsmanship and attracting potential customers.

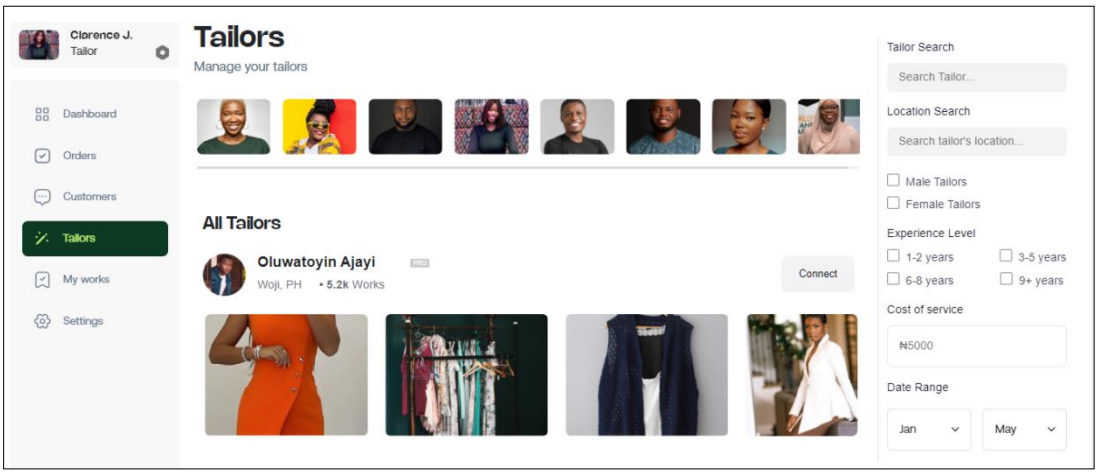

Figure 8 Tailor Interface Page

Tailor Gallery Page

This module is an integral part of the system, designed to function as a virtual gallery. It offers tailors and designers a platform to exhibit their creations, share their previous works, and garner reviews from customers. This module not only enhances the visibility of professionals on the platform but also aids customers in making informed choices.

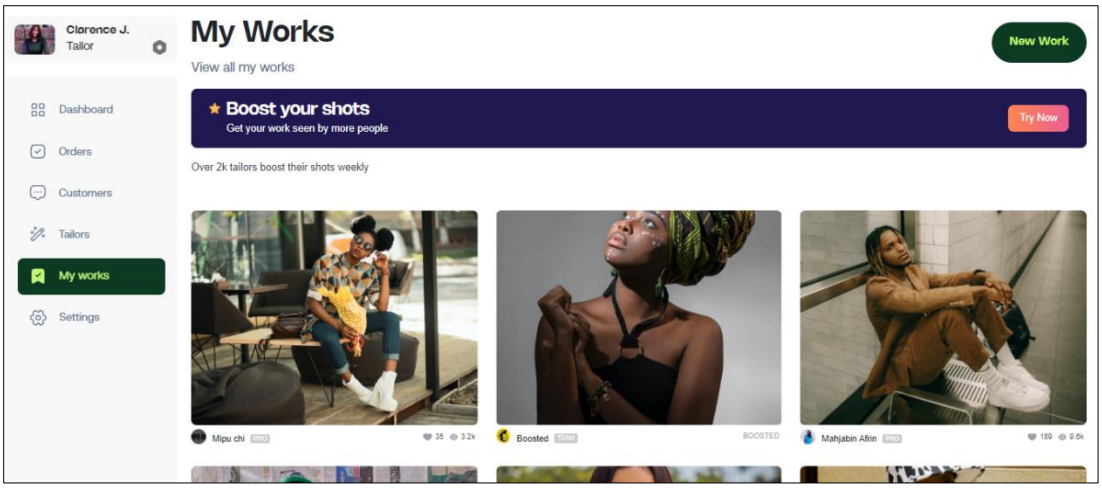

Figure 9 My Works Page

4.3. Customer Module

This consists of the activities of the tailors which involves login, reset password, overviewing the dashboard, keep tracking of orders and networking amongst tailors.

4.4. Customer Dashboard Page

It displays an overview of the user's followed tailors and the top tailors for the application aswell as personalized recommendations or featured fashion items. This page may also provide quick access tailored to the user's interests and past activities.

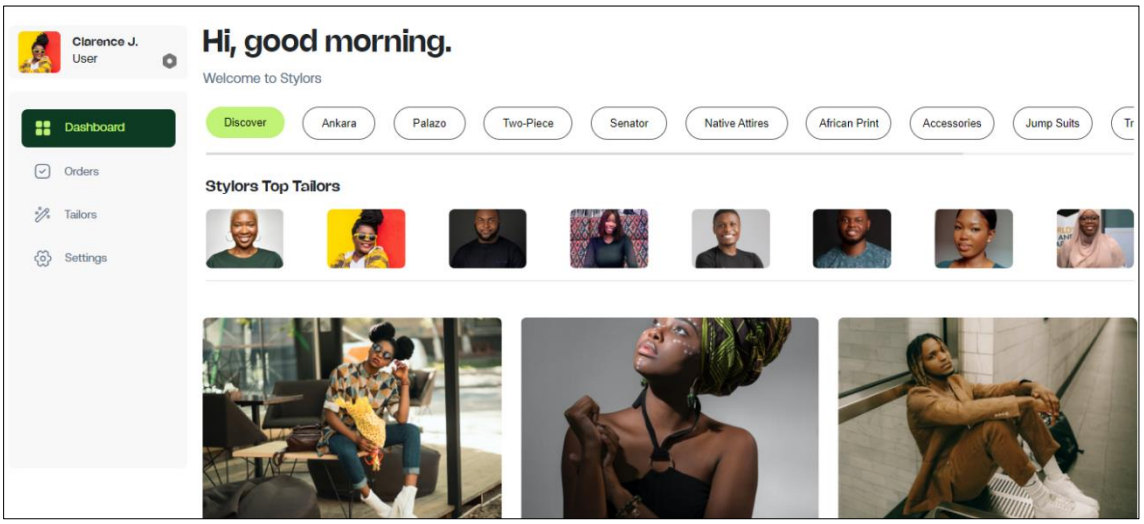

Figure 10 Customer Dashboard Page

4.5. Customer Order Page:

It shows a list of current and past orders placed by the user, including details like order status, amount spent, and date and time of the order. Users can use this page to track their orders or make repeated orders.

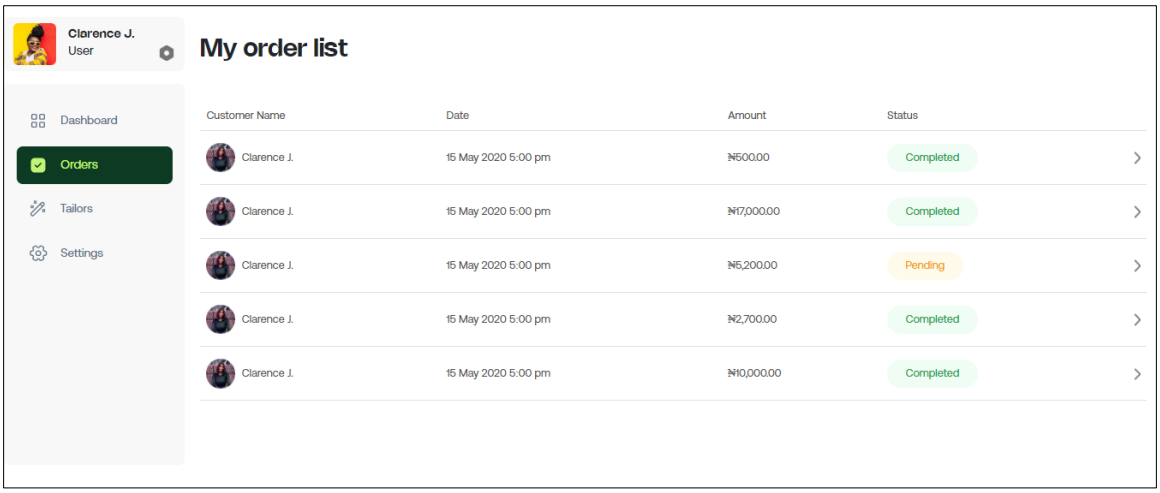

Figure 11 Customer Order Page

Customer-To-Tailor Interface

This section features profiles of various tailors, showcasing their work, ratings, and reviews. Users can browse, connect, or request services from tailors. It includes filters for location, experience level, or specific fashion styles, allowing users to find tailors that match their preferences.

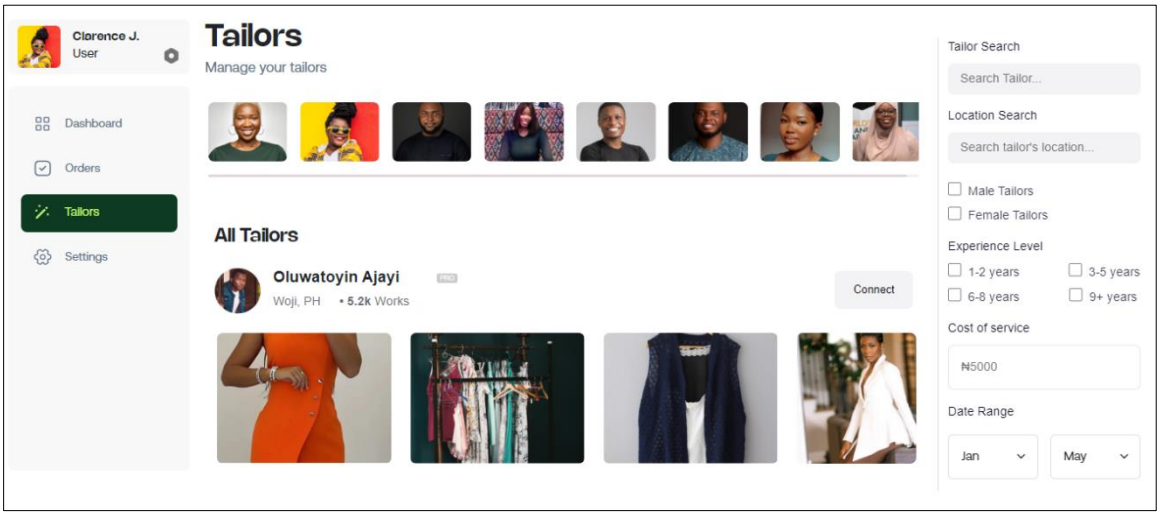

Figure 12 Customer-To-Tailor Interface

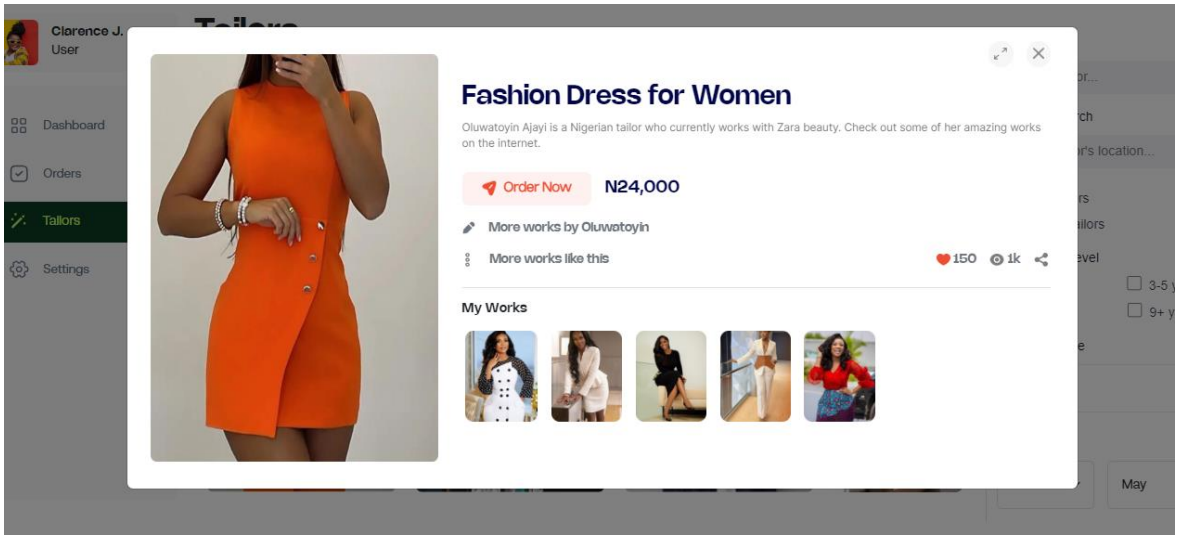

Figure 13 Detail of a Tailor's Work

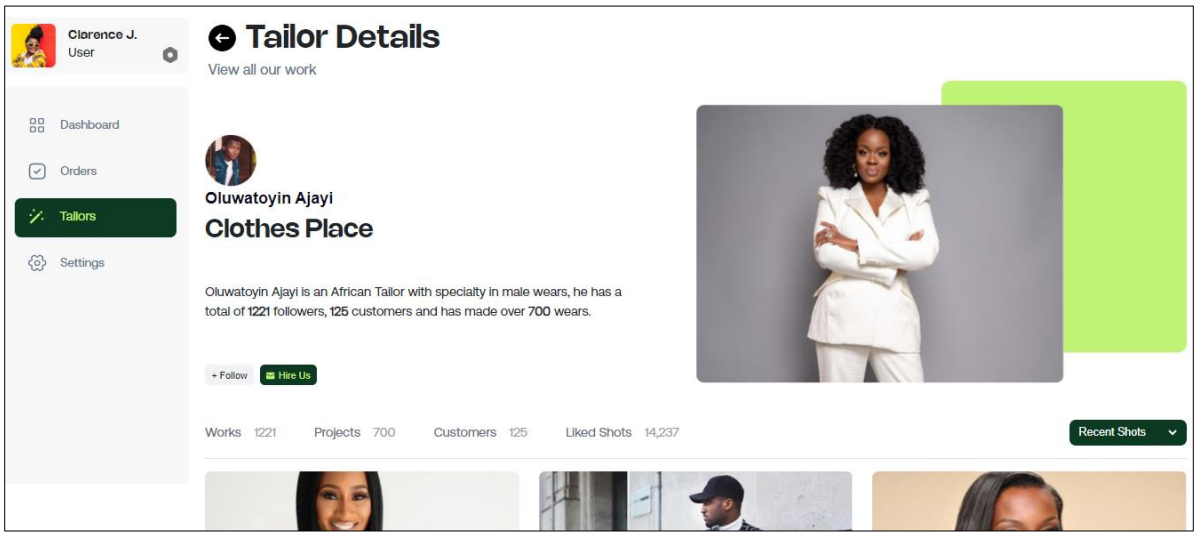

Figure 14 Tailor's Profile

Reset Password Page

Users enter their email address to receive a link or instructions on how to reset their password. This is useful if they have forgotten their current password.

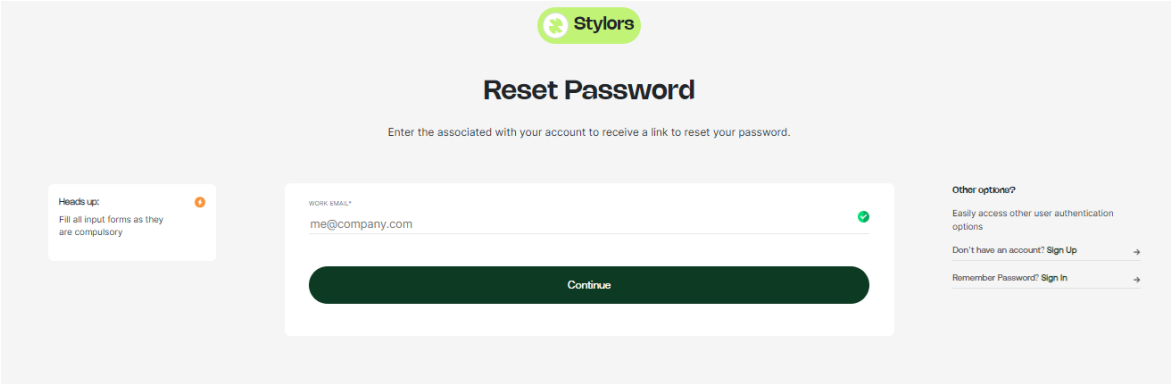

Figure 15 Reset Password Page

OTP Verification Page

Users enter a One-Time Password (OTP) sent to their email. This step ensures that the person attempting to perform the action is the legitimate account owner.

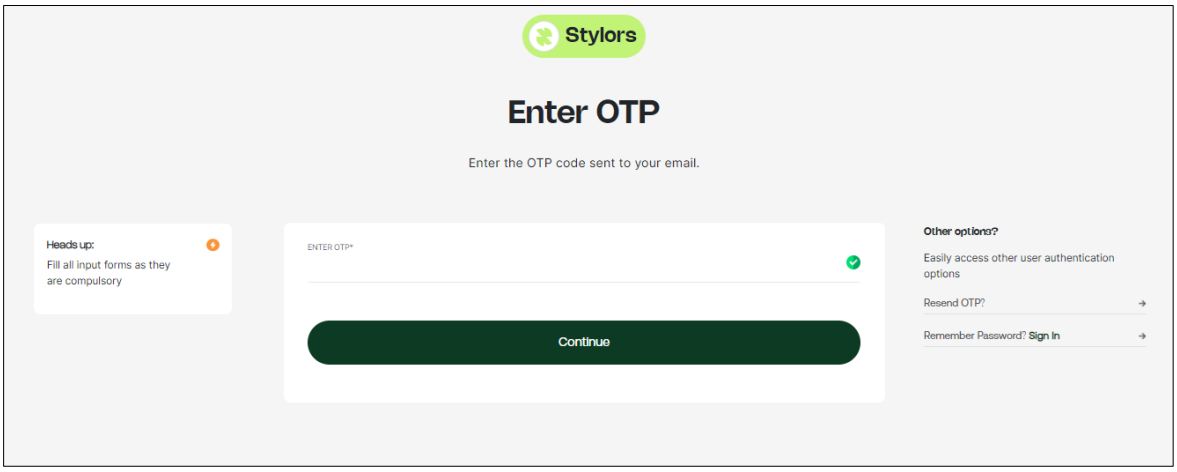

Figure 16 OTP Verification Page

Software Testing

Software testing is essential for assessing and confirming that a software program or product performs as intended. Bugs can be avoided, requirements can be confirmed, and efficiency can be enhanced. Unit testing, integration testing, system testing, and acceptance testing are all testing stages that were carried out during the development of this software. Table 1 below shows different test cases that were carried out.

Unit Testing

This entails checking out each component or feature of a piece of software. The goal is to confirm that each program component carries out its intended function.

4.5.1. .Integration Testing

In this stage of software testing, separate units and modules are evaluated collectively to see if they function as intended when combined. Testing the interface between the different modules is the goal.

System Testing

After the integration test is finished, this step involves testing the entire system.

This type of testing, which is carried out prior to the product's release to the market, verifies the finished, completely integrated software product.

Acceptance Testing

This is carried out to evaluate approval. Customers, users, or other authorized stakeholders test an application in this way to see if it satisfies their requirements or accomplishes their goals. This stage is crucial because it affects whether the client will accept the software or not.

Table 1 Test cases

Test ID	Description	Pre-Condition	Test Steps	Test Data	Expected Result	Actual Result	Status
U1	Accessing the User Dashboard	User must be logged in	1. Log in as a user.	User credentials	User's dashboard displays with activities and recommendations.	User's dashboard displays with activities and recommendations.	Pass
T1	Managing Orders as a Tailor	Tailor must be logged in	1. Log in as a tailor. 2. Click on the 'Orders' link.	Tailor credentials	Orders page opens with order details.	Orders page opens with order details.	Pass
TT1	Exploring and Interacting with Tailors	User/Tailor must be logged in	1. Log in as a user or tailor. 2. Navigate to 'Tailors' page. 3. Interact with a profile.	User/Tailor credentials	Able to view and interact with tailor profiles.	Users are able to view and interact with tailor profiles.	Pass
US1	New User Account Registration	User is not already registered	1. Navigate to sign up page. 2. Fill in details. 3. Click 'Sign Up'.	New user details	User registers and can log in.	User registers and can log in.	Pass
OTP1	Verifying User Identity with OTP	Action requiring OTP initiated	1. Go to OTP page. 2. Enter OTP. 3. Click 'Verify'.	OTP	User completes verification process.	User completes verification process.	Pass
TC1	Accessing Customer Information by a Tailor	Tailor must be logged in	1. Log in as a tailor. 2. Navigate to 'Customers' page.	Tailor credentials	Tailor views and interacts with customer info.	Tailor views and interacts with customer info.	Pass
UO1	Managing Orders by a User	User must be logged in	1. Log in as a user. 2. Navigate to 'Orders' page.	User credentials	User views and manages their orders.	User views and manages their orders.	Pass
TMW1	Managing Tailor's Portfolio	Tailor must be logged in	1. Log in as a tailor. 2. Navigate to 'My Works' page.	Tailor credentials	Tailor manages their works portfolio.	Tailor can manage their works portfolio.	Pass
TNO1	Creating New Order in Tailor's Module	Tailor must be logged in	1. Log in as a tailor. 2. Create New Order.	Order details	Tailor creates and saves a new order.	Tailor can create and save a new order.	Pass

UOA1	Opening the Web Application (User Perspective)	Access to a web browser	1. Open browser. 2. Enter Stylus URL. 3. Observe homepage.	Web browser, URL	Homepage loads successfully without errors.	Homepage loads successfully without errors.	Pass

5. Conclusion

E-commerce involves the buying and selling of goods or services through the internet, with electronic data interchange (EDI) and electronic funds transfer (EFT) playing a major role. Historically, platforms like ARPANET and companies like Amazon and eBay were pivotal in developing e-commerce. E-commerce platforms today offer varied product ranges or specialize in specific areas, such as fashion. The widespread accessibility of e-commerce platforms has significantly transformed shopping by allowing consumers to browse, compare, and purchase goods from any location.

A review of related works shows the development of e-commerce platforms for various industries. These platforms enhance the marketing reach and sales potential of businesses, streamlining tasks such as inventory tracking and report generation. The methodologies for developing these systems often follow structured models like the waterfall approach, ensuring efficiency and scalability.

The requirements elicitation process identified the needs of users and businesses, focusing on both user and system requirements. User needs include features like browsing, ordering, and account management, while system requirements focus on scalability, security, and hardware considerations. Technologies such as JavaScript, Python, and MongoDB are highlighted as essential software tools. System design, represented by use case and sequence diagrams, illustrates interactions between users and the system, emphasizing user experience and smooth backend processes.

Finally, the implementation focuses on modules for both tailors and customers, providing functionalities such as order management, customer interaction, and a virtual gallery for tailors to showcase their work.

The development of e-commerce platforms, particularly in specialized fields like fashion, relies on a deep understanding of both user and system needs. Incorporating strong security, scalability, and user-friendly interfaces ensures that these platforms can cater to a wide audience, offering tailored experiences for both consumers and designers. With continued advancements in technology and thoughtful system design, e-commerce platforms will further revolutionize online shopping experiences.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Aulia Jannah, Adila Mawadda Meuraxa, Azzahrah. (2023). Web Based E-Commerce System Design at EXO Shop Using The Waterfall Method. *Journal of Information Systems*, 1-5.

[2] Dhanyakumar Kurmude, Pradip Paithane, and Sangeeta Kakarwal. (2019). Computing Techniques, Trends And Types Of Ecommerce. *Proceedings of SARC International Conference*, (pp. 1-5). Pattaya, Thailand.

[3] Fernando, E. (2023). Designing E-Commerce Sales Of Footwear Using The Waterfall Method. *International Journal of Science, Technology & Management*, 1531-1541.

[4] Jaya, S. M. (2023). Web-Based Furniture Sales Information System. *Journal of ImproSci*, 47-60.

[5] Miftahul Jannah, Nora Anisa. (2022). E-Commerce Based Sales Application To Increase Profit During Covid19 In Furniture Stores. *Journal of Informatics and Telecommunication Engineering*, 276-285.

[6] Ram611 O'Callaghan and Jon A. Turner. (n.d.). Electronic Data Interchange Concepts And Issues. Retrieved from https://core.ac.uk/download/pdf/162457926.pdf