

Chong Sport Trading E-Commerce Website

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Abstract

Despite the widespread adoption of e-commerce, many small and medium-sized enterprises (SMEs) in this industry struggle to establish a robust online presence, resulting in limited market reach and growth potential. This project addresses the gap by developing a comprehensive e-commerce platform tailored for Chong Sport Trading, a local SME specializing in premium sports equipment. The main objective of this research is to design and implement an intuitive, user-friendly, and feature-rich e-commerce website that caters to both general and niche audiences in the sports market. The methodology includes Agile software development, employing iterative design, coding, and testing phases to ensure user-centricity and adaptability. The results show a big improvement in user engagement and sales efficiency, with early prototypes getting great feedback for being easy to use and highly functional. The project highlights the importance of digital innovation in empowering SMEs to compete in a highly saturated market. Future work will focus on enhancing scalability, integrating AI-driven analytics for customer insights, and expanding the platform's ecosystem to include mobile applications. This research contributes to the digital transformation of SMEs and sets a foundation for further exploration in e-commerce platform development.

1. Introduction

A variety of techniques and technologies are used in the building of the Chong Sport Trading website to guarantee reliable performance, user-friendliness, and visual appeal. Before building a website, a certain framework needs to be chosen as the structure. Hence, the B2C (Business-to-Consumer) framework, also called retail e-commerce, is a business model that involves sales between online businesses and consumers [1]. Aligning well with the project's scope of catering to athletes, fitness enthusiasts, and collectors, e-commerce has become essential for businesses in today's digital economy, enabling them to reach a wider audience and streamline operations. E-commerce not only broadens a business's market reach but also provides opportunities to enhance customer engagement through tailored digital experiences [2]. E-commerce platforms integrate essential functions, such as inventory management, secure transactions, and customer support, allowing businesses to operate more efficiently and better serve customer needs [3]. For retailers, especially those in niche markets like sports and outdoor equipment, an online platform can enhance visibility, enabling customers from various locations to browse products and make purchases without needing to visit the physical store [4].

For Chong Sport Trading, an e-commerce website is crucial for modernizing and expanding its current business model, which relies on in-person visits and manual ordering through social media channels like Facebook and WhatsApp. Moving online would enable Chong Sport Trading to overcome operational limitations, such as managing inventory centrally and automating order processes, while making it easy for customers to access

products, view exclusive items, and place orders anytime, anywhere. Through digital inventory updates, customers could view real-time stock availability and select items with confidence, reducing the likelihood of order cancellations or misunderstandings. This shift would help Chong Sport Trading compete better in the sports equipment market by providing features like secure payments, organized product categories, and even promotional offers to attract and engage customers. Aligning with today's e-commerce standards, Chong Sport Trading's online platform would help drive growth, improve customer satisfaction, and ensure long-term competitiveness in a rapidly evolving retail environment [5].

2. Literature Review

In this Chapter, relevant literature and research on e-commerce systems for the establishment of Chong Sport Trading E-Commerce Website are discussed. The chapter begins with a brief overview of similar systems in the domain and then delves into the specific needs of the case study, outlining why a new system is essential for the shop. Additionally, this chapter examines the technologies and methodologies relevant to creating the proposed system, providing insights into how these choices will improve current operations. Finally, existing systems with related functionalities are observed to identify valuable features and potential improvements for Chong Sport Trading.

To design a user-centred e-commerce platform for Chong Sport Trading, we can collect insights from existing related systems in the Malaysian market. By analyzing Nemuree Shop, Red-C Sport, and Al-Ikhsan, we can explore key features in online sports and specialized retail, including product organization, user experience, and functionality. These examples provide valuable guidance for creating an e-commerce website that meets the needs of Chong Sport Trading's target audience of athletes, outdoor enthusiasts, and collectors. A comprehensive review of Nemuree Shop, Red-C Sport, and Al-Ikhsan has been conducted to analyze their strengths and weaknesses to inform the creation of Chong Sport Trading. Table 1 presents the summary and comparison of these systems.

Table 1 System Comparison

Features/System	Nemuree Shop[6]	Red-C Sport[7]	Al- Ikhsan[8]	Chong Sport Trading
Log In	√	√	√	√
User Profile	√	√	√	√
Product Category	√	√	√	√
Shopping Cart	√	√	√	√
Exclusive Product	√	X	X	√
Bidding	X	X	X	√
Help & Support	√	√	√	√
Reviews & Rating	√	√	√	√

Table 1 highlights that Chong Sport Trading has similar e-commerce features to platforms such as Nemuree Shop, Red-C Sport, and Al-Ikhsan, which include log-in, user profiles, product categorization, and a shopping cart. To make Chong Sport Trading different from others is by implementing a unique bidding system with exclusive products. The extended features aim to enhance customer engagement and fulfill unmet needs in the sports e-commerce market.

3. Methodology

The Agile Software Development Model was chosen for developing the outdoor and sports product website system for Chong Sport Trading and the activities that had been carried out in each phase. Agile methodology ensures flexibility, continuous user feedback, and iterative improvements to meet user expectations while prioritizing security and reliability.

The Agile Software Development Model is a dynamic, iterative approach that emphasizes customer collaboration and responsiveness to change, ensuring that the project evolves with user input and market needs [6]. Agile methodology allows development teams to quickly respond to changes, which is crucial in the dynamic

e-commerce market where customer preferences and trends can shift rapidly [9]. Furthermore, Agile’s customer-centric focus ensures continuous feedback from users, helping to align the final product with their needs and expectations, thereby enhancing user experience and customer retention [10]. This model suits the Chong Sport Trading website as it allows for frequent adjustments based on feedback, aligning the platform closely with user preferences and business goals. Agile Software Development Model was selected for its flexibility, user-focused approach, and iterative structure, which supports ongoing improvement, adaptability, and faster delivery of valuable features. Refer to Appendix A for the project timeline Gantt Chart. Table 2 indicates the software development activities and their task.

Table 2 Software development activities and their task

Phase	Task	Output
Planning	<ul style="list-style-type: none"> Propose the Chong Sport Trading E-Commerce Website project Plan the project title, scope, and timeline 	<ul style="list-style-type: none"> Project proposal Develop Gantt Chart
Analysis	<ul style="list-style-type: none"> Analyze Chong Sport Trading’s needs and requirements Interview stakeholders (Chong Sport Trading) Gather the insights from existing similar systems 	<ul style="list-style-type: none"> Detailed Chong Sport Trading’s needs and requirements Analysis from existing similar systems DFD, ERD, Flowchart
Design	<ul style="list-style-type: none"> Develop wireframes for Chong Sport Trading E-Commerce Website Design Chong Sport Trading database structure Design user interface 	<ul style="list-style-type: none"> Wireframes User Interface design Database design (schema and data dictionary)
Development	<ul style="list-style-type: none"> Implement the interface design for Chong Sport Trading E-Commerce Website Coding System prototype 	<ul style="list-style-type: none"> Program and code with expected features Complete System Interface
Testing	<ul style="list-style-type: none"> Perform unit, integration, system, performance testing for Chong Sport Trading E-Commerce Website 	<ul style="list-style-type: none"> Test reports Final system product

3.1 System Requirements

System Requirement Analysis is a vital process in system development that defines what a system must achieve to meet user needs and business objectives. The development of the Chong Sport Trading e-commerce platform necessitates a thorough analysis of both functional and non-functional requirements to ensure the system aligns with user expectations and business goals. This section identifies the critical functionalities needed to provide a seamless user experience, enhance operational efficiency, and support the scalability of the platform.

Table 3 *Functional requirements*

No	Module	Description
1	Customer Management Module	<ul style="list-style-type: none"> Chong Sport Trading's system allows customers to register, log in, and manage their profiles (e.g., update contact information). Restrict login whenever a wrong credential is entered.
2	Order Management Module	<ul style="list-style-type: none"> Chong Sport Trading's system facilitate order placement, including viewing product details and selecting quantities. Chong Sport Trading's system provide order's status and updates for customers. Allow administrators to process, approve, or cancel orders and manage inventory allocation. Allow the administrator to provide order status and updates for customers
3	Payment and Bidding Module	<ul style="list-style-type: none"> Chong Sport Trading's system supports secure payment for customers. Enable customers to bid on rare items, with real-time bid status updates and notifications. Restrict the bidding if customer placed bid below minimum. Allow administrators to monitor payment transactions and manage bidding activities efficiently.
4	Product Review and Rating Module	<ul style="list-style-type: none"> Chong Sport Trading's system allows customers to place a review of a product in the system. Allow customers to place a rating of a product in the system. The system should display the review and rating in the system for other users.
5	Reporting Module	<ul style="list-style-type: none"> Chong Sport Trading's system generates reports on sales, inventory levels, and bidding outcomes. Allow administrators to filter and customize reports based on specific time periods and criteria.

Table 4 *Non-functional requirements*

No	Requirement	Description
1	Performance	Chong Sport Trading's system must handle up to 500 concurrent users without significant crashes.
2	Security	Chong Sport Trading's system ensures secure data transmission with HTTPS and encrypted credentials.
3	Data Integrity	Chong Sport Trading's system should ensure that data such as client profiles and order history is accurate.
4	Usability	Chong Sport Trading's system must provide a user-friendly navigation and layout for all user categories.
5	Maintainability	Chong Sport Trading's system should be easy to update and maintain, including adding new features and fixing bugs.

Table 5 User requirements

No	Requirement
1.	Users must register and log in to access personalized features in Chong Sport Trading’s system.
2.	Admins should manage products and monitor inventory efficiently in Chong Sport Trading’s system.
3.	Collectors should participate in real-time bidding for rare items in Chong Sport Trading’s system.
4.	Customers should view stock availability and order status in Chong Sport Trading’s system.
5.	Chong Sport Trading’s system must allow seamless checkout and secure payments.
6.	Users should update their profile details, such as name, email, and password, on their account page in Chong Sport Trading’s system.
7.	Customers should add, edit, and remove items in their shopping cart before checkout in Chong Sport Trading’s system.
8.	Customers should be able checkout the items in cart in Chong Sport Trading’s system.
9.	Users should filter products by price, category, and availability for easier navigation in Chong Sport Trading’s system.
10.	Collectors should track bidding history and receive alerts for outbids or winning bids in Chong Sport Trading’s system.
11.	Customers should receive notifications for successful purchases, bids, and shipping updates in Chong Sport Trading’s system.
12.	Administrators should be able to provide order status for customers in Chong Sport Trading’s system.
13.	Customers should leave reviews and ratings for purchased products to help other buyers make decisions Chong Sport Trading’s system.
14.	Administrators should be able to edit, update dan delete the products, advertisement, and latest updates in Chong Sport Trading’s system.

3.2 System Analysis

The system analysis results, including the context diagram, data flow diagram (DFD) and the entity-relationship diagram (ERD) and flowchart, are presented in this sub-section. A systematic approach is used to perform a comprehensive system analysis to capture the interactions and structure of the system.

Context diagrams provide an overview of the interaction between the system and its users. They illustrate the input and output data flow between the system and external entities, offering a high-level view of how the system operates within its environment. Figure 1 illustrates the context diagram.

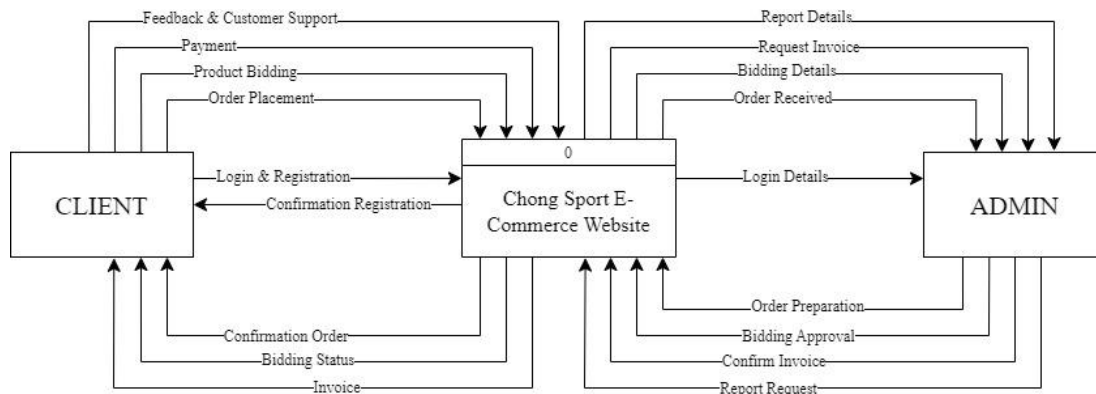


Fig. 1 Context Diagram

Data Flow Diagram (DFD) is a graphical representation of the flow of data or input from an entity through a process, which then generates output either to another entity or stored in data storage. DFD shows each input and output for each entity and process. Figure 2 shows the developed system's Level 0 Data Flow Diagram (DFD 0).

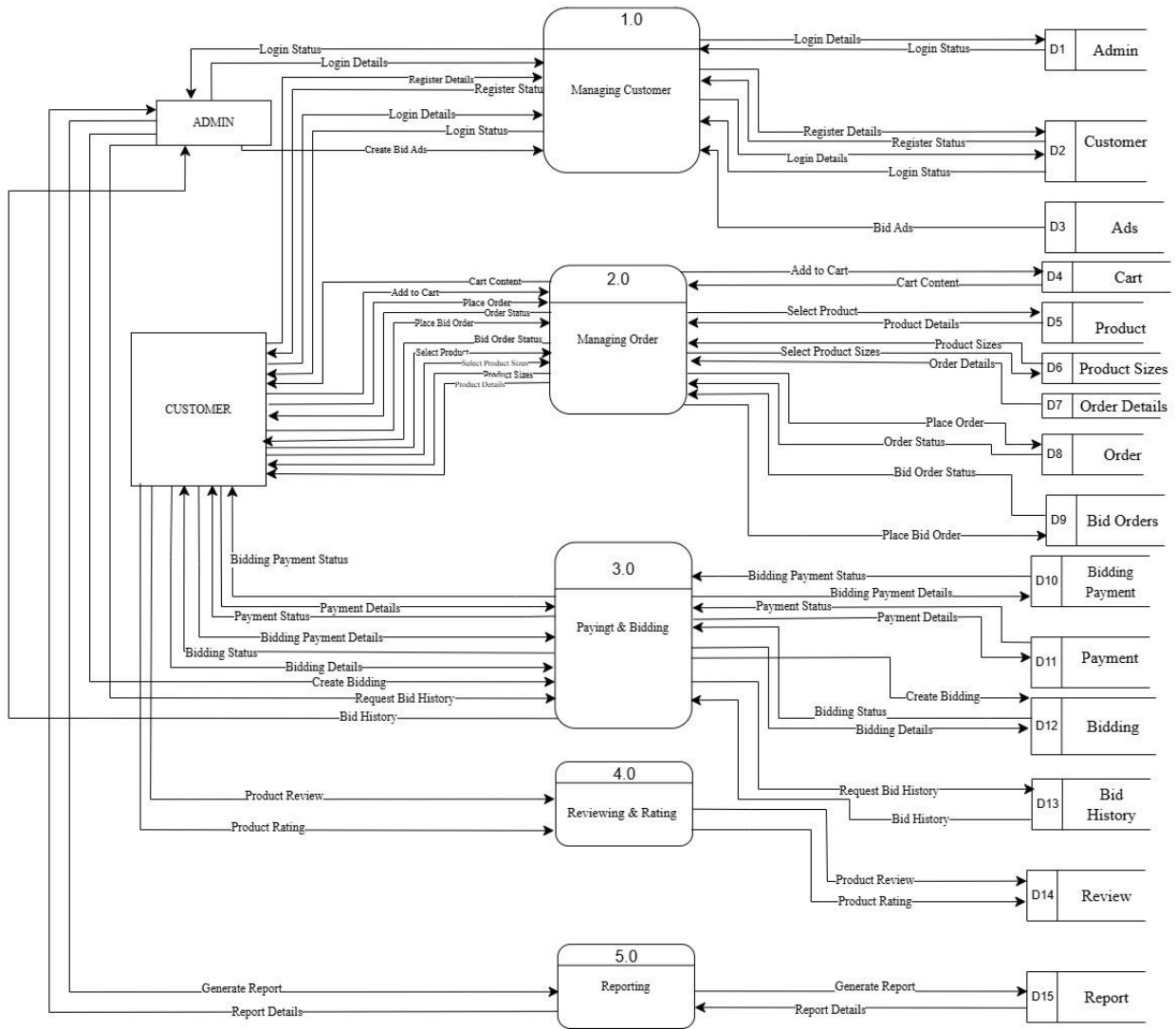


Fig. 2 Data Flow Diagram Level 0

An Entity Relationship Diagram (ERD) is a visual representation of how different entities (objects or concepts) relate to each other in a system. ERDs are commonly used in database design to model the structure of a database and ensure data integrity. The ERD in Figure 3 shows the developed system, illustrating the relationships and cardinalities among the identified entities between tables

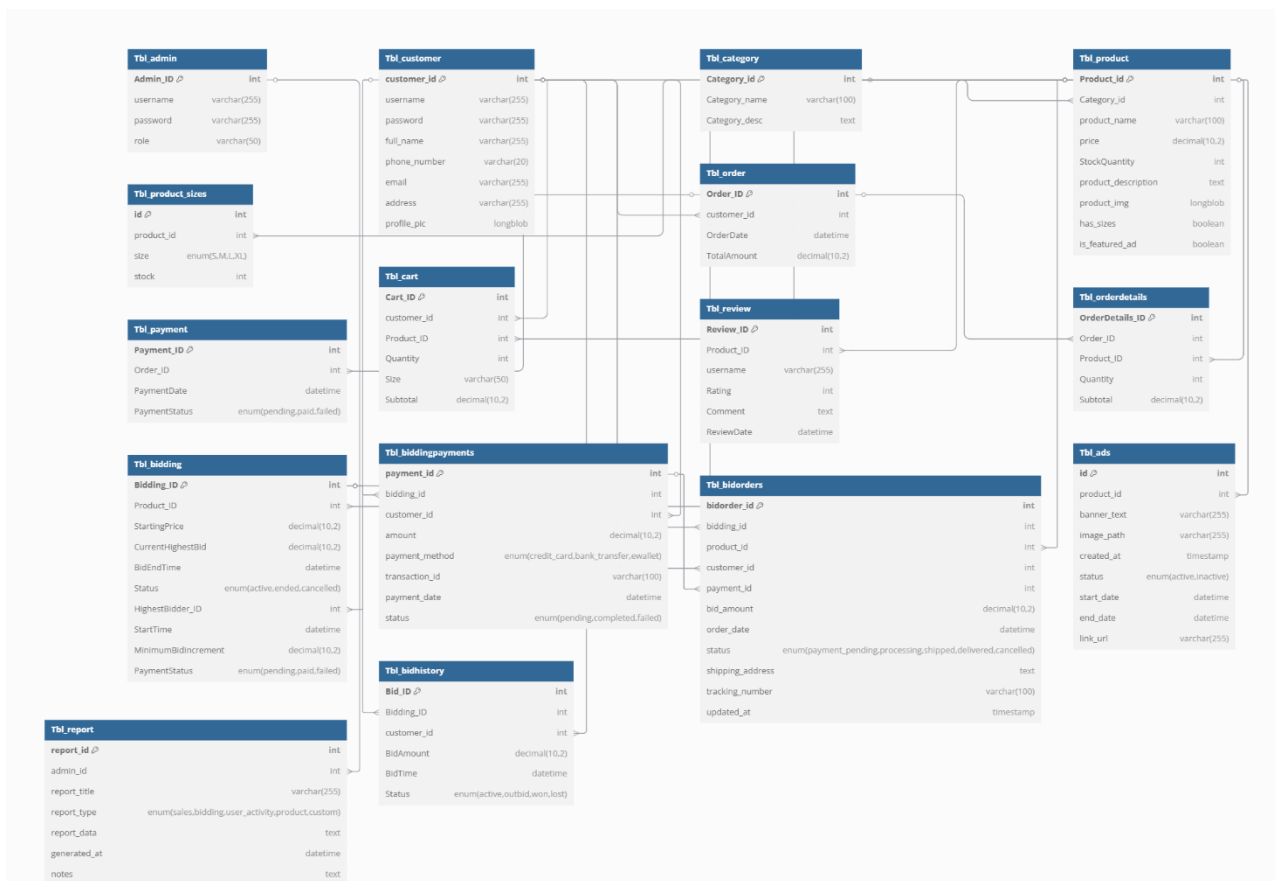


Fig. 3 Entity Relationship Diagram

This flowchart illustrates the user journey in an e-commerce and bidding system. Figure 4 shows a flowchart for the developed system.

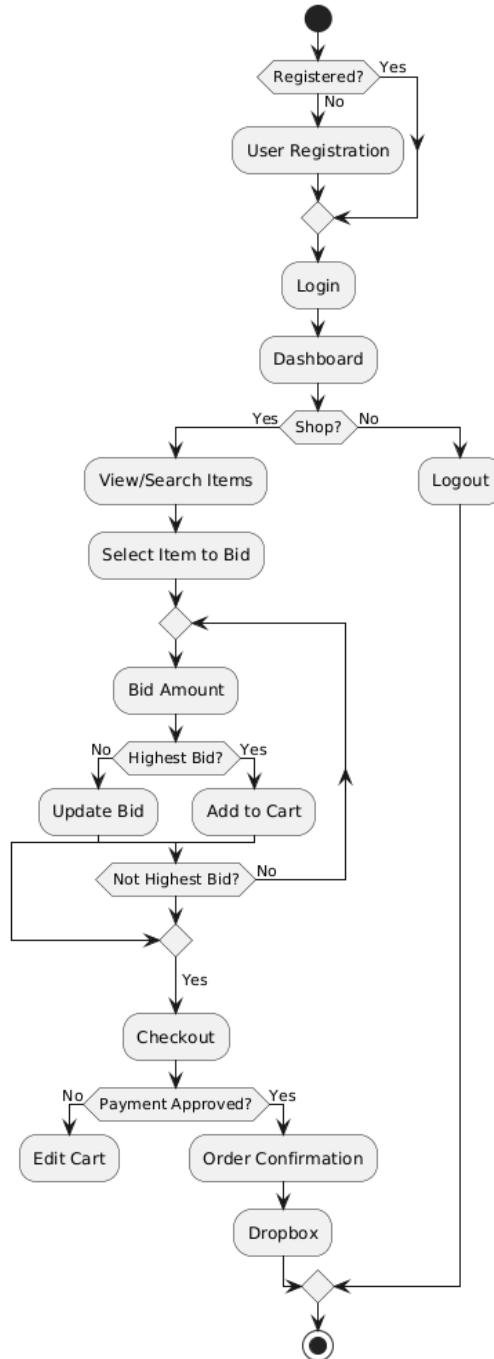


Fig. 4 System's Flowchart

3.3 Design

After all the users' requirements were successfully analyze, the project will proceed in design phase. In this phase, both interface and database had been designed to help visualize the system before proceeding with the coding the system. The system design encompasses the user interface design and database design aligning with the objectives to deliver a user-friendly, secure, and scalable online shopping experience. Figure 5 below shows the system architecture for the proposed system.

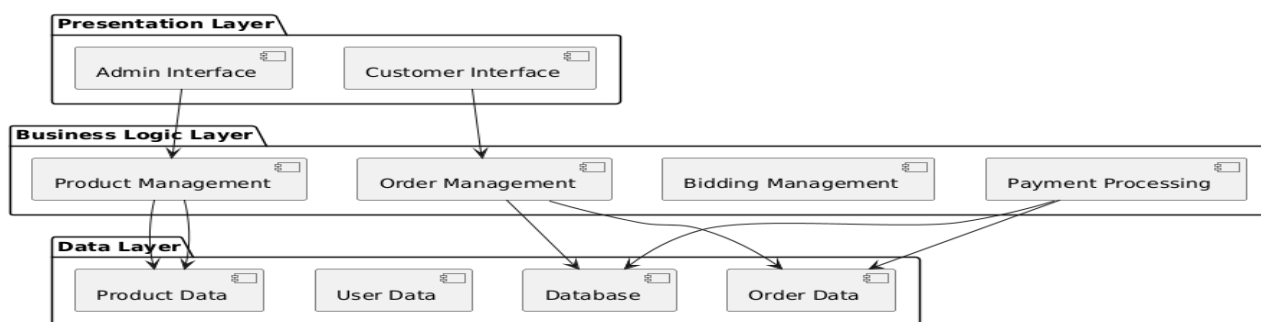


Fig. 5 System Architecture of proposed system

3.3.1 Database Design

The following are the tables from the database that have been designed and extracted from the class diagram.

- i. **Tbl_admin** (Admin_ID, username, password, role)
- ii. **Tbl_customer** (customer_id, username, password, full_name, phone_number, email, address, profile_pic)
- iii. **Tbl_category** (Category_id, Category_name, Category_desc)
- iv. **Tbl_product** (Product_id, Category_id, product_name, price, StockQuantity, product_description, product_img, has_sizes, is_featured_ad)
- v. **Tbl_product_sizes** (id, product_id, size, stock)
- vi. **Tbl_bidding** (Bidding_ID, Product_ID, StartingPrice, CurrentHighestBid, BidEndTime, Status, HighestBidder_ID, StartTime, MinimumBidIncrement, PaymentStatus)
- vii. **Tbl_bidhistory** (Bid_ID, Bidding_ID, customer_id, BidAmount, BidTime, Status)
- viii. **Tbl_bidorders** (bidorder_id, bidding_id, product_id, customer_id, payment_id, bid_amount, order_date, status, shipping_address, tracking_number, updated_at)
- ix. **Tbl_cart** (Cart_ID, customer_id, Product_ID, Quantity, Size, Subtotal)
- x. **Tbl_order** (Order_ID, customer_id, OrderDate, TotalAmount)
- xi. **Tbl_orderdetails** (OrderDetails_ID, Order_ID, Product_ID, Quantity, Subtotal)
- xii. **Tbl_payment** (Payment_ID, Order_ID, PaymentDate, PaymentStatus)
- xiii. **Tbl_biddingpayments** (payment_id, bidding_id, customer_id, amount, payment_method, transaction_id, payment_date, status)
- xiv. **Tbl_review** (Review_ID, Product_ID, username, Rating, Comment, ReviewDate)
- xv. **Tbl_ads** (id, product_id, banner_text, image_path, created_at, status, start_date, end_date, link_url)
- xvi. **Tbl_report** (report_id, admin_id, report_title, report_type, report_data, generated_at, notes)

3.3.2 Interface Design

This section will indicate the user interface design of the proposed system. The user interface (UI) is designed with clear navigation and labeling, enabling users to complete tasks effortlessly and without confusion (Nielsen, 1994). The interface helps the users to understand the system's process and its functions. Figure 6 shows the login interface. It includes input fields for entering a username or email and password. The login button validates the credentials with the server to grant access. The user homepage interface in Figure 7 welcomes users after they log in, displaying personalized content and quick navigation options. It features a dashboard with widgets for homepage, shop, or account updates. The user interface homepage also includes a search bar for user to search their preferred items. The admin dashboard interface in Figure 8 is a centralized hub for website administrators to manage users, products, orders, biddings and reviews. It includes a navigation panel for accessing various management tools and widgets that display key metrics like total sales, active users, and pending orders. Admins can add, edit, or remove products, resolve user issues, and moderate reviews. The product rating and review

interface in Figure 9 allows users to provide feedback on purchased items. It features a star rating system where users can assign a score from one to five and a text box for detailed comments.

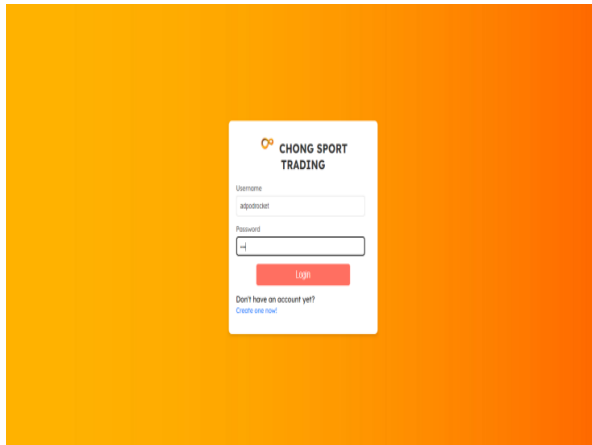


Figure 6: Login Interface Design

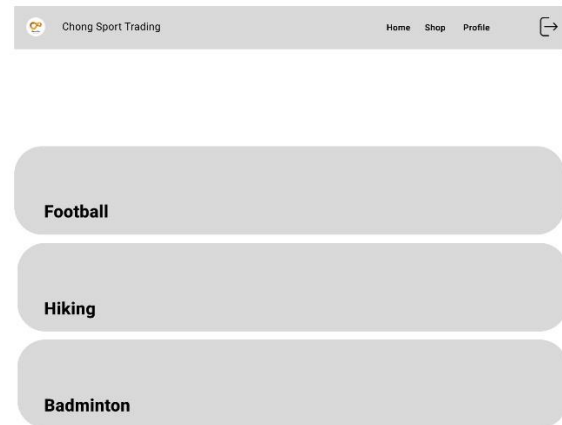


Figure 7: User Homepage Interface Design

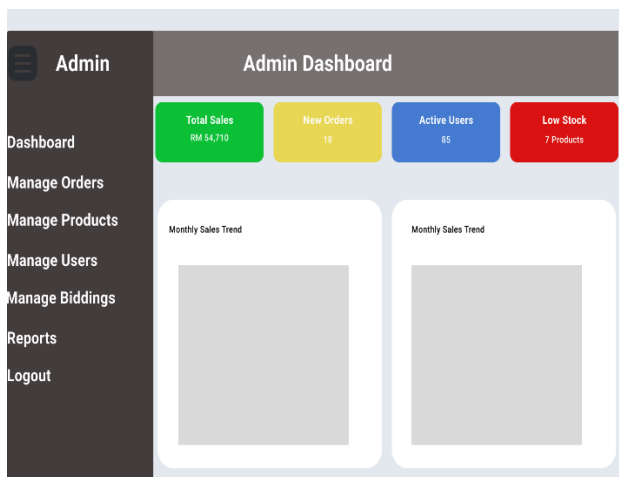


Figure 8: Admin Dashboard Interface Design

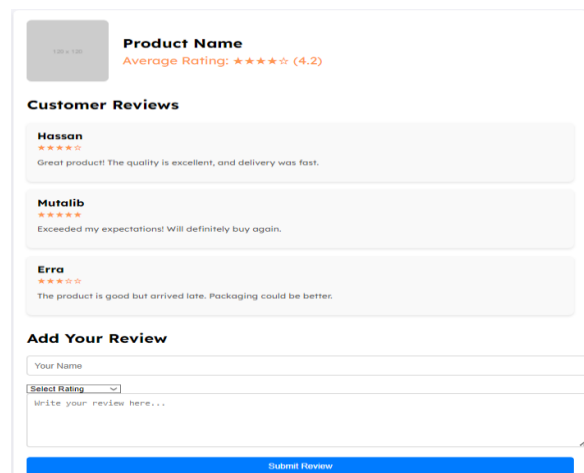


Figure 9: Product Rating & Review Interface Design

4. Implementation

The implementation phase involved the systematic translation of architectural designs and specifications into a fully operational digital platform, encompassing both front-end user interfaces and back-end functionalities. This transformation from design to deployment was executed through carefully planned development iterations that ensured all system components worked cohesively.

4.1 System Implementation

The system implementation comprised two primary components: website development and bidding module integration. The development utilized HTML, CSS, JavaScript, and PHP for coding, supported by XAMPP as the local server environment. XAMPP provided a complete development stack including Apache web server, MySQL database, and PHP server-side scripting capabilities, enabling comprehensive local testing and database management through its integrated phpMyAdmin tool.

Visual Studio Code (VS Code) was employed as the primary Integrated Development Environment (IDE), offering efficient coding support through features such as syntax highlighting and debugging tools. This environment significantly enhanced development productivity and code accuracy throughout the project lifecycle.

4.1.1 Module: Customer Management Module

Figure 10(a) shows the user interface of account registration page. Generally, this registration form features a simple layout with fields for username, full name, phone number, email, and password, followed by a submit button. A "Login now" link is provided for existing users. The clean design ensures quick and easy account creation with only essential fields. Figure 10(b) shows the login page interface after the registration. The user interface

consists of an input box for user to enter their username and password that they already created during the registration process.

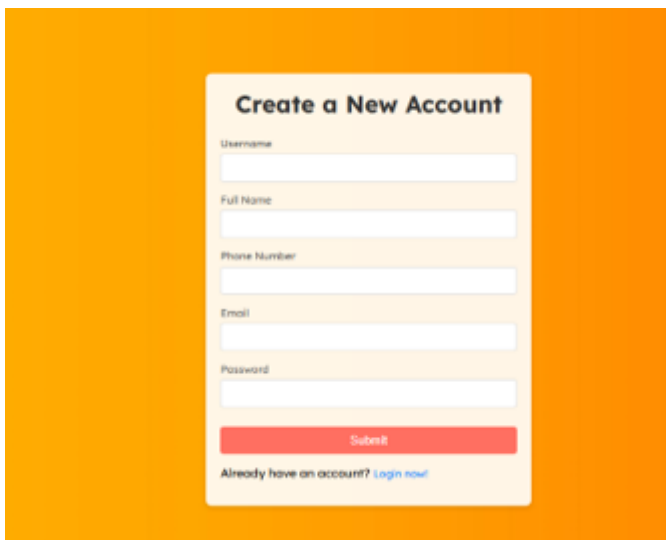


Figure 10(a): Account Registration User Interface

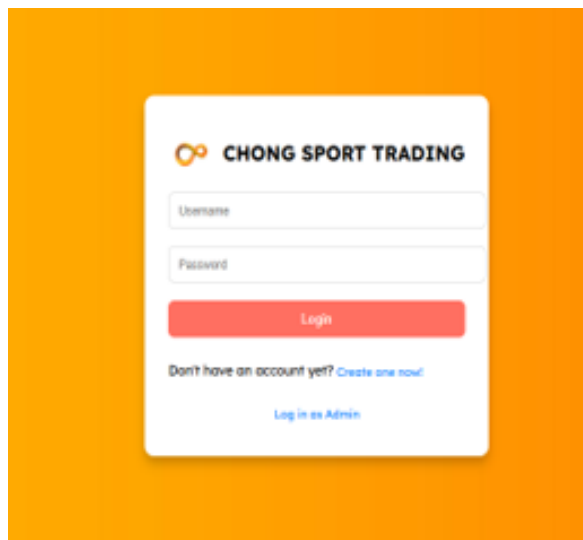


Figure 10(b): Customer Login User Interface

4.1.2 Module: Order Management Module

Figure 10(c) displays product details for the website. It shows the product image, name, price, and description in a structured layout. Also included quantity and size needed for purchasing. Furthermore, an add-to-cart button is present to streamline the purchasing process. Figure 10(d) displays the order details of a customer. It shows the order date, order's status, order product details, and total amount of the order

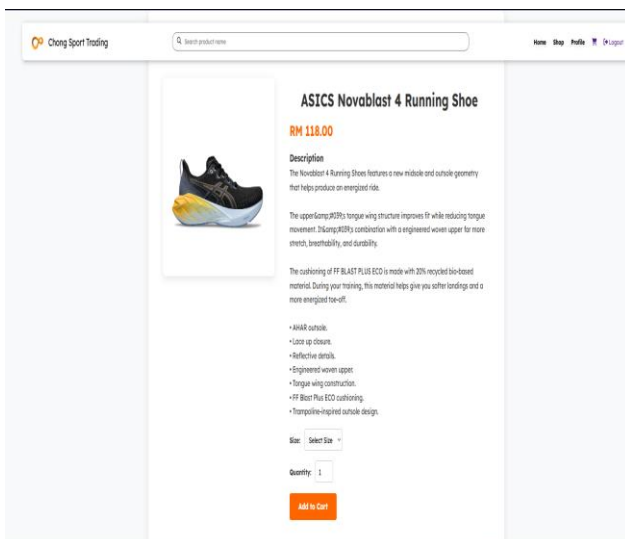


Figure 10(c): Product's Details User Interface

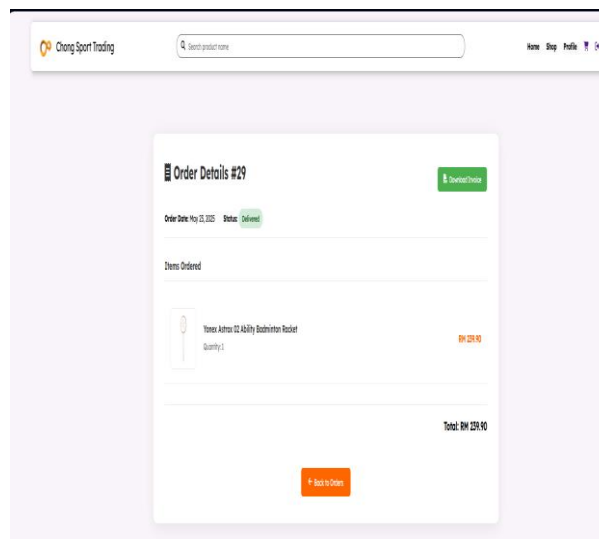


Figure 10(d): Order's Details User Interface

4.1.3 Module: Payment & Bidding Module

Figure 10(e) displays the payment module where the checkout contains the order summary (Product's name, price, quantity, subtotal, discount and taxes). And a section for user to fill the shipping information and credit card information for the payment method. Figure 10(f) displays the function from the previous source code into user interface. The page displays the bidding product details like product's name, image, description. Also included the starting price, current highest bid, and bidding countdown timer. The 'Place Bid' button is for user to submit their bidding that should be higher than the current highest bid.

Checkout

Order Summary

Product	Quantity	Price
QURCHIA Hiking Backpack 20 L - HM Alpena 100	1	RM 45.00
Subtotal		RM 45.00
Shipping Charge (5%)		RM 2.25
Registered User Discount (20%)		-RM 9.00
Total		RM 46.55

Shipping Information

alamat default

Let 8977/Akampung Sungai Tau Tanah Ganteng

Batu Caves

Selangor

48100

Malaysia

Payment Information

56667221663

0917

118

Place Order

Figure 10(e): Payment User Interface

Place Your Bid

Current Highest Bid: **RM200.00**
Minimum Bid: **RM210.00**

210.00

Submit Bid

Celebrate the Year of the Dragon with this powerful limited edition from GXS PRIND. Designed for speed and control, it features a high-tension frame, lightweight build, and dragon-inspired red-gold graphics. With only a limited number available, this collector's piece combines performance and prestige in one striking racket.

Starting Price: RM200.00
Current Highest Bid: RM200.00
Bid Ends In: **23h 59m 36s**

Place Bid

enthusiasts and outdoor adventurers by providing an intuitive

Figure 10(f): Bidding Function User Interface

4.1.4 Module: Rating & Review Module

Figure 10(g) displays the review and rating module of a product. The module is placed under the product where contains the customer past reviews and ratings. Admin is unable to alter or delete reviews to maintain transparency. Also included a form for customers to leave review and rating on all products.

Chong Sport Trading

Search products here

Home Shop Profile Support

ASICS Novablast 4 Running Shoe

RM 118.00

Description

The Novablast 4 Running Shoe features a new midsole and outsole geometry that helps produce an energized ride.

The upper's GEL-STRUCTURE+ tongue structure improves fit while reducing tongue movement. The GEL-STRUCTURE+ combination with an engineered women upper for more stretch, breathability, and durability.

The outsole of FF BLAST PLUS ECO is made with 20% recycled bio-based material. During your morning, this material helps give you softer landings and a more energized run-off.

- AMB outsole
- Lock-up closure
- Reflective details
- Engineered women upper
- Tongue wing construction
- FF Blast Plus ECO outsole
- Transpire-inspired outsole design

Size:

Quantity:

Add to Cart

Figure 10(g): Review and Rating User Interface

4.1.5 Module: Reporting Module

Figure 10(h) displays the monthly sales report in table form where it contains the month and total sales each month. Also contains 'Export to CSV' and 'Export to PDF' buttons for downloading the report for better review. Figure 10(i) displays the bidding report in a table form. The table contains all the bidding data like Bid ID, Product ID, Product Name, Current Highest Bid, username, and Bid Time indicates the winner of each bid.

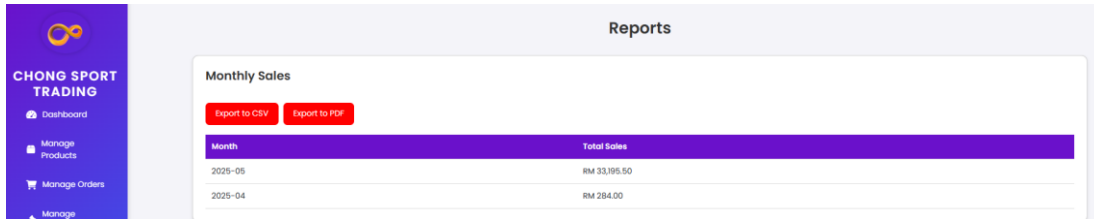


Figure 10(h): Monthly Sales Report User Interface

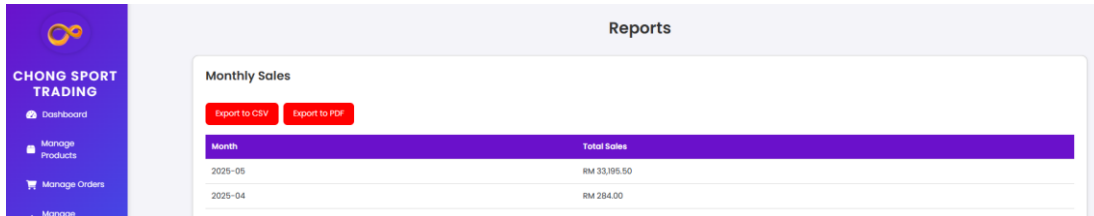


Figure 10(i): Bidding Report User Interface

4.2 System Testing

System testing is a critical phase in the development of the Chong Sport Trading E-Commerce Website System. It involves evaluating the complete and integrated system to verify that it meets the defined functional and non-functional requirements. This process ensures that all modules work seamlessly together, and the system behaves as expected under various conditions. The goal is to identify any discrepancies or bugs before deployment and confirm system readiness for real-world use.

4.3 System Functionality Testing

System functionality testing was conducted through comprehensive User Acceptance Testing (UAT) across all major modules of the platform. This included simulating real-world user interactions to validate that the system’s functions perform correctly and reliably. Each functional module was tested using predefined test cases with specific input conditions and expected outputs. These functional tests validated that the system aligns with its intended design and meets user expectations.

Table 6 Test Case for Customer Management Module

Module: Customer Management Module				
Test Case ID	Description	Expected Result	Actual	Pass/Fail
M1-1	To check whether customer can register for an account	The user should be able to create for an account	The user has successfully created for an account	Pass
M1-2	To check whether a customer can login into the system	The user should be able to login into the system	The user has successfully logged into the system	Pass
M1-3	To check whether the system will restrict login whenever a wrong credential is entered	The system should restrict login when incorrect credentials has been entered	The system restricted the login when an incorrect or no credentials has been entered	Pass

Table 7 Test Case for Order Management Module

Module: Order Management Module				
Test Case ID	Description	Expected Result	Actual	Pass/Fail
M2-1	To check whether customer can place new order	The user should be able to place for an order	The user has successfully placed order	Pass
M2-2	To check whether a customer can view product details in the system	The user should be able to view product details in the system	The user has successfully viewed product details in the system	Pass
M2-3	To check whether the administrator is allowed to provide order's status and updates for customers	The system should allow the administrator to provide order's status and updates for customers	The system should allow the administrator to provide order's status and updates for customers	Pass
M2-4	To check if a customer can select quantities of a product	The user should be able to select quantities of a product	The user has successfully selected quantities of a product	Pass

Table 8 Test Case for Payment and Bidding Module

Module: Payment and Bidding Module				
Test Case ID	Description	Expected Result	Actual	Pass/Fail
M3-1	To check whether customer can go through the payment process	The user should be able to place make a payment	The user has successfully made their payment	Pass
M3-2	To check whether a customer can place a valid bid in the system	The user should be able to place a valid bid in the system	The user has successfully placed a valid bid in the system	Pass
M3-3	To check whether the system would restrict the bidding if customer placed bid below minimum	The system should restrict the bidding if customer placed bid below minimum	The system restricted the bidding when customer placed bid below minimum	Pass
M3-4	To check if the administrator can manage bidding activities in the system	The user should be able to manage bidding activities in the system	The user has successfully managed bidding activities	Pass

Table 9 Test Case for Product Review and Rating Module

Module: Product Review & Rating				
Test Case ID	Description	Expected Result	Actual	Pass/Fail
M4-1	To check whether customer can place a review of a product in the system	The user should be able to place a review of a product in the system	The user has successfully placed a review of a product in the system	Pass
M4-2	To check whether customer can place a rating of a product in the system	The user should be able to place a rating of a product in the system	The user has successfully placed a rating of a product in the system	Pass
M4-3	To check whether the system will display the review and rating in the system	The system should display the review and rating in the system	The system displayed the review and rating in the system	Pass

Table 10 Test Case for Product Reporting Module

Module: Reporting Module				
Test Case ID	Description	Expected Result	Actual	Pass/Fail
M5-1	To check whether the system can generate reports on sales	The user should be able to create for an account	The user has successfully created for an account	Pass
M5-2	To check whether the system can generate reports on bidding outcomes	The user should be able to login into the system	The user has successfully logged into the system	Pass
M5-3	To check whether the system allow administrators to filter reports based on specific time periods	The system should allow user to filter reports based on specific time periods	The system allowed user to filter reports based on specific time periods	Pass

4.3 User Acceptance Testing

This section presents the results of the User Acceptance Testing (UAT) conducted for the Chong Sport Trading E-Commerce Website. A total of 16 participants took part in the evaluation by completing an online questionnaire aimed at assessing key aspects of the system, including functionality, user-friendliness, interface design, and overall performance. The primary objective of this UAT was to evaluate whether the system effectively meets user expectations and addresses the operational challenges previously encountered by Chong Sport Trading E-Commerce Website.

Figures 11(a) and 11(b) show a graph bar and pie chart displaying the percentage of user testing total 16 users on the registration and login section for customers and administrators of the system respectively. The registration process works well overall (average 4/5 rating), but a few users faced difficulties, indicating room for

minor improvements like clearer instructions. Meanwhile, the login system performed flawlessly, with no reported issues. These results confirm the system's strong usability, particularly its reliable login functionality aligns with the test case results.

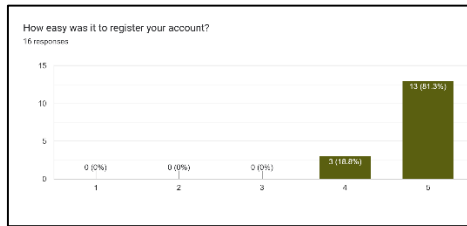


Figure 11(a): Graph Bar on Registration

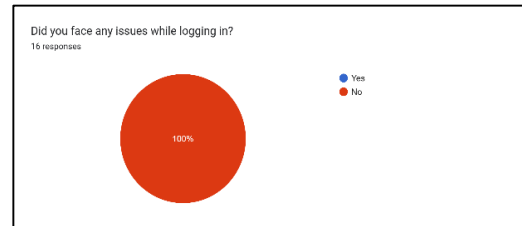


Figure 11(b): Pie Chart on Login

Figures 11(c) and 11(d) show pie charts displaying the percentage of user testing total 16 users on order management module. Feedback shows all users easily viewed product details (100%) and received clear order updates (100%), confirming these features work perfectly. The system performs exceptionally well in displaying product information and providing order updates which aligns the test case result.



Figure 11(c): Pie Chart Viewing Product Details

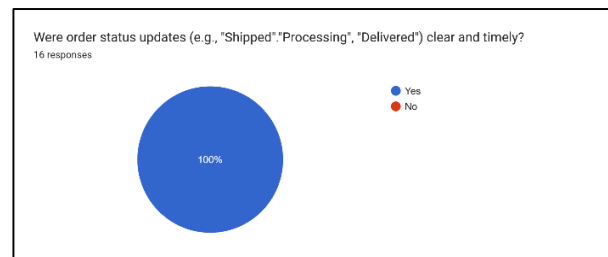


Figure 11(d): Pie Chart on Order Status Updates

Figures 11(e), 11(f) and 11(g) show graph and pie charts displaying the percentage of user testing total 16 users on payment and bidding module. The system effectively states bid rules (100% clarity) and delivers smooth payments for most users (81%). However, 19% experienced bidding issues and 18% faced payment difficulties, indicating opportunities to improve these transactional features.

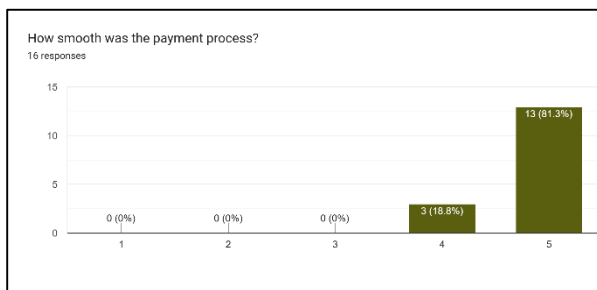


Figure 11(e): Graph Bar on Payment Process

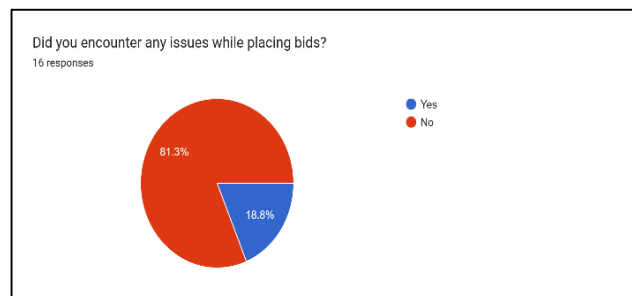


Figure 11(f): Pie Chart on Order Status Updates

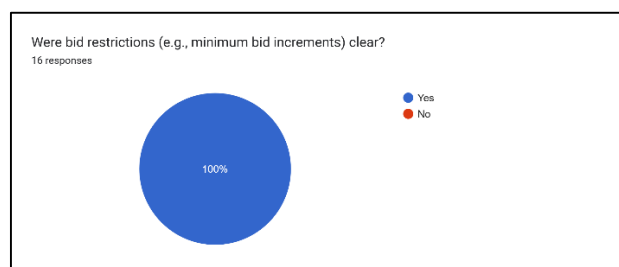


Figure 11(g): Pie Chart on Bidding Process

Figures 11(h) and 11(i) show graph and pie charts displaying the percentage of user testing total 16 users on rating and review module. The feedback shows most users (81%) found submitting product reviews easy (rated 4-5/5), though a small group (19%) had trouble. Importantly, all users confirmed their reviews appeared correctly on product pages (100% success rate). This indicates the review and rating module works well overall in the system.

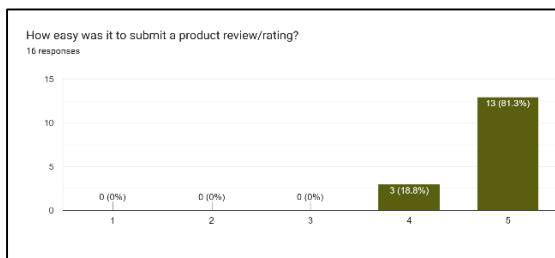


Figure 11(h): Graph Bar for Rating & Review

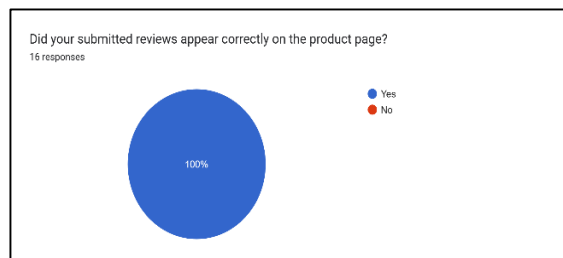


Figure 11(i): Pie Chart on Review displayed

5. Conclusion

In conclusion, the development of the Chong Sport Trading e-commerce platform represents a significant step forward in modernizing the business operations of the company. By transitioning from manual, offline methods to an integrated online system, the platform enhances operational efficiency, improves customer engagement, and expands market reach. The Agile software development model proved to be effective in delivering a flexible, user-centred website that meets both business and customer needs, ensuring adaptability and ongoing improvement. The key features, such as secure payments, product categorization, and the unique bidding system for rare items, distinguish Chong Sport Trading from competitors and cater to the niche market of sports equipment collectors. Early feedback and testing indicate that the platform's design and functionality are well-received by users, with improvements in user engagement and transaction efficiency. The project highlights the importance of e-commerce in empowering small and medium-sized enterprises (SMEs) to compete in a fast-evolving digital landscape. By embracing digital innovation, Chong Sport Trading is positioned to capitalize on new growth opportunities while providing a seamless shopping experience for its customers. Future developments will focus on scalability, AI-driven customer insights, and mobile application integration, ensuring that the platform remains competitive and responsive to market demands. This research contributes to the digital transformation of SMEs and provides valuable insights for further advancements in e-commerce platform design and implementation.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Ahmad Danial Azmi, Abd Samad Hasan Basari; **data collection:** Ahmad Danial bin Azmi; **analysis and interpretation of results:** Ahmad Danial Azmi, Abd Samad Hasan Basari; **draft manuscript preparation:** Ahmad Danial Azmi, Abd Samad Hasan Basari. All authors reviewed the results and approved the final version of the manuscript.

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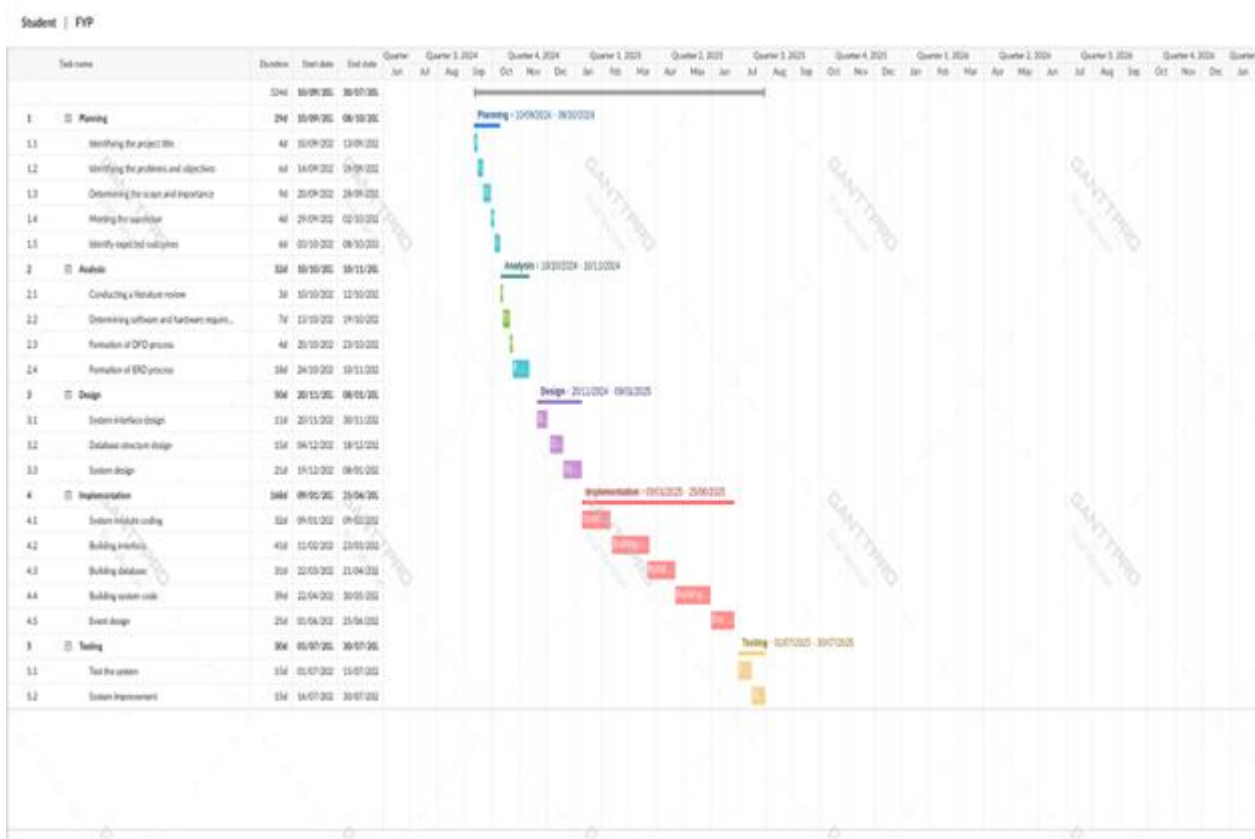
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Appendix A




Chong Sport Trading E-Commerce Feedback

Thank you for participating in our questionnaire.

We want to hear your feedback so we can keep improving our website. Please fill this quick survey and let us know your thoughts (your answers will be anonymous).

* Indicates required question

How easy was it to register your account? *

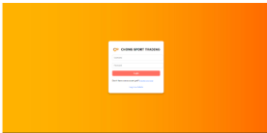


1 2 3 4 5

Not very Very much

Customer Management


Did you face any issues while logging in? *



Yes
 No

Order Management


How intuitive was the order placement process? *



1 2 3 4 5


Not intuitive Very intuitive

Were you able to easily view product details and quantities before ordering? *



Yes
 No


Were order status updates (e.g., "Shipped", "Processing", "Delivered") clear and timely? *



Yes
 No

Payment and Bidding Module

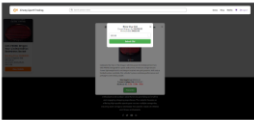
How smooth was the payment process? *



1 2 3 4 5

Not Smooth Very Smooth


Did you encounter any issues while placing bids?



Yes
 No

Review and Rating Module

How easy was it to submit a product review/rating? *



1 2 3 4 5

Hard Very easy

Did your submitted reviews appear correctly on the product page?

Yes
 No

General Experience

What's one feature you loved the most? *

Your answer: _____

Did your submitted reviews appear correctly on the product page?

Yes
 No

General Experience

What's one feature you loved the most? *

Your answer: _____

What's one improvement you'd suggest? *

Your answer: _____

Overall satisfaction with the website? *

Very Dissatisfied Very Satisfied

Submit Clear form

Questionnaire UAT