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THE DEVELOPMENT OF ONLINE PERSONAL SHOPPER E-COMMERCE APPLICATIONS FOR KOREAN PRODUCTS (EPERS)

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Abstract:

Despite the rapid growth of e-commerce, particularly in international trade, many businesses face substantial issues related to order management, customer satisfaction, and operational efficiency. This is especially true for platforms specialising in niche markets, such as those focusing on Korean products. Personal shoppers, who act as intermediaries in connecting consumers with Korean goods, often encounter difficulties overseeing the complex logistics of order fulfillment processes; hence, this study developed an Online Personal Shopper E-Commerce Application for Korean Products (ePERS) to solve the issue. This web-based platform aims to simplify the order process for customers and administrators/personal shoppers involved in purchasing goods from Korea. The system was developed in response to challenges faced by personal shoppers in managing order processes, particularly the inefficiencies associated with order tracking and order management. The ePERS platform adheres to the System Development Life Cycle (SDLC) by utilising an adapted Waterfall Model comprising six phases: system planning, system analysis, system design, system development, system testing and evaluation, and system documentation. A thorough system testing process was implemented to

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evaluate the platform's performance by creating and assessing various operational scenarios. This approach aims to provide a robust system that enhances the ordering experience for users and administrators. Initial findings indicate that the ePERS has improved order tracking and overall customer satisfaction. While preliminary results are promising, further evaluation is still essential to assess the system's long-term performance and reliability. Future work should focus on continuous improvement and platform adaptation based on user feedback and market demands.

Keywords:

E-commerce, Korean Products, Online Shopping, Order Management, Personal Shopper, Web Application

Introduction

In the post-pandemic era, e-commerce growth has markedly influenced purchasing behavior due to a substantial increase in users (Aryani et al., 2021). The diversity of e-commerce mechanisms should encompass consumers, organizations, and society, as each element affects e-commerce globally (Turban et al., 2012; Niranjanamurthy M et al., 2013). According to a report by retailinasia.com, the e-commerce industry in Malaysia has recorded a 19.9% increase, with a trade value of MYR 38.2 billion in 2022. This phenomenon has shifted the spectrum for users to consider online business platforms necessary in the post-pandemic era. Current studies indicate that various factors contribute to online purchasing patterns and business changes. For example, virtual Reality offers users new experiences through AI-based approaches by providing intelligent purchasing suggestions (Siregar, 2024). In addition, accessible online payment methods, robust security features, and widespread and stable Internet infrastructure have transformed e-commerce businesses (Hui Chong, 2023; Siregar, 2024).

According to previous research, approximately 85% of the global population is involved in online business and e-commerce, which can be attributed to the evolution of technology and altered lifestyles in society (Siregar, 2024). Considering these developments and circumstances, particularly regarding purchasing patterns, business methods, and factors that influence buyer experience in online businesses, it is essential to improve system capabilities to keep pace with these developments and transformations (Santos et al., 2022). A report by Capillary Technology highlighted Malaysia's significant e-commerce growth, as shown in Table 1. The country's mobile commerce segment shows a compound annual growth rate (CAGR) of 19.7%, while the overall e-commerce market is projected to reach US$13.43 billion by 2029 (Kashyap, 2023). This growth is driven by several factors, including a digitally savvy population seeking good deals, a high Internet penetration rate of 89%, and strong government support for the sector. This trend is reflected in the expected increase in users, with the number of e-commerce shoppers projected to reach 3.6 billion by 2029 (Kashyap, 2023).

Table 1. Malaysia's E-Commerce Growth (2021–2023)

Year	E-commerce Growth (%)	E-commerce Value (MYR billion)
2021	16.2	31.8
2022	19.9	38.2
2023	21.0*	45.3*

(Source: Kashyap (2023))

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Malaysia accounts for four out of every ten e-commerce transactions. A significant amount of cross-border spending is due to the unavailability of local products and better prices offered. For most Malaysian online shoppers, the top countries in their list offer a variety of products online, ranging from beauty products to electronic devices, including the United States of America (USA), Singapore, Japan, South Korea, and China. This, in turn, reflects the reasons for the direct purchase trend between Malaysia and Korea from an e-commerce perspective (Hui Chong, 2023). Although the growth and promising prospects of e-commerce business between Malaysia and several Southeast Asian countries, particularly South Korea, indicate a positive trend in Malaysia's e-commerce industry, some challenges exist. Direct purchases via an e-commerce platform have become problematic because of the absence of systematic and efficient methods for directly purchasing Korean products. Conventionally, direct purchasing is performed by personal shoppers, whereby items or goods are bought from relevant shops in the respective country (i.e., South Korea) following customer demands or current purchasing trends. Although this method enables customers to minimize shipping costs and facilitate the purchase of foreign goods, there are drawbacks such as communication barriers, delayed delivery, lack of transparency in fees and expenses, and legal and tax issues.

With the spread of Korean products to Malaysian consumer markets, the personal shopper e-commerce Application of Korean Products (ePERS) was proposed as an extension of the efficiency and accessibility of cross-border online shopping. ePERS provides users with all the features of online shopping through options such as managing orders, converting foreign currency into local currency, and tracking orders in real time, making it more transparent and user-friendly. Earlier direct-purchase systems, especially those involving personal shoppers, were often described as inefficient, laboring under long delays in communication, murky price structures, and limited visibility of the status of orders. Additionally, most Korean online sellers do not allow shopping using non-Korean payment gateways, and even require the delivery of local phone numbers, hindering Malaysian shoppers. These limits are handled with ePERS, where personal shopper services are combined with an advanced order-management site, providing a practical solution to people needing items of Korean origin that are not offered on more popular e-commerce sites. Moreover, the system makes it easier to store data and enables businesses to run more efficiently. The study also aimed to critically assess the effectiveness of ePERS in enhancing customer satisfaction and operational efficiency (Song et al., 2022).

In addition, this study underscores the ePERS system, which was developed to facilitate online personal shopping (OPS) purchase orders, thus enabling OPS to execute orders and purchase Korean products more effectively. All orders and product-related data are systematically and effectively stored, updated, and maintained, which has significant implications for online businesses. The ePERS system is operated in a web-based environment to improve transaction and product information management. This study also highlights the importance of developing system capabilities to support the evolving demands of e-commerce technology and online businesses driven by companies' societal expectations. Moreover, this study also addresses the need for systematic system utilization, particularly in implementing the online ordering process, which may meet the identified needs and demands of the targeted users. The following sections present a literature review related to the study, methodology for developing the ePERS system, an overview of the ePERS implementation, and suggestions for improving the ePERS system.

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Literature Review

Online personal shopping (OPS) provides recommendations by assisting Malaysian consumers in acquiring their preferred Korean products. These personal shoppers focus on understanding their clients' style and needs, suggesting items that match their clients' preferences, and organizing products to choose from and deliver to customers (Arslan et al., 2021). The rising demand for a personalized shopping experience emphasizes the vital role of OPS in Malaysia's e-commerce landscape. Studies show that Malaysian consumers, especially younger ones, are particularly open to the tailored services offered by OPS. This trend is fuelled by increasing digital literacy and the widespread use of mobile devices for online shopping. In addition to the influence of the Korean Wave in society, OPS has a notable effect on consumer satisfaction and loyalty, as well as the ability to shape consumer purchase intentions and enhance e-commerce website features to appeal to Malaysian consumers. Although studies have shown that the perception of ease of use and trust does not significantly impact consumer purchase intentions, the perception of usefulness and subjective norms positively affect online purchase intentions. Therefore, this may suggest that the integration of OPS as one of the crucial elements in e-commerce applications will be able to revolutionize the online shopping landscape, thus enhancing the customer perception of the usefulness of e-commerce platforms while effectively driving their engagement and purchasing behavior and transforming the online shopping landscape (Ru et al., 2021; Lee & Kim, 2023).

Nevertheless, from the enterprise resource planning (ERP) perspective, the successful integration of OPS into e-commerce applications is viable with the help of the order management system (OMS), production planning and control (PPC), material requirements planning (MRP), production scheduling (PS), and distribution planning (DP), for which business analysis can be performed faster, more efficiently, and more accessible. OMS provides automated, updated, and real-time business information, including inventory, vendor, customer databases, billing, and payment transactions to simplify and manage the execution at every stage of order processing, from order creation to item delivery, and sales reports for the businesses. The substantial tasks of the OMS are to deliver these tasks and perform PPC stages such as MRP, PS, and DP (Indu & Das, 2017; Kunath & Winkler, 2019). According to previous research, the OMS's adequate and holistic function is critical for preventing complications and errors in the most significant procedures. To illustrate this, earnings reports can be created quickly, and sales records can be studied accurately (Reddy K & KGK, 2016; Basir et al., 2018). Although the benefits of OPS and OMS are clear separately, current studies have been insufficient in integration, especially in cross-border e-commerce in niche markets, such as the consumer exchange between Malaysia and Korea. There is still a considerable gap in the in-depth research on integrated OPS and OMS systems, which can simplify the process of making a transaction right down to the point of delivery. This study addresses this gap by developing and evaluating a holistic hybrid OPS and OMS site targeting Malaysian consumers buying Korean goods.

The latest innovations emphasize artificial intelligence (AI) as a critical aspect of improving customer experience in retail and e-commerce. Patil (2025) stated that AI-assisted personalization, predictive analytics, and real-time engagement tools, including recommendation engines, chatbots, and visual AI technologies, will enhance consumer satisfaction, loyalty, and operational efficiency. Similarly, Yeldan et al. (2024) illustrated how AI-based technologies can streamline order procurement and inventory management via predictive analysis, forecasting of imports, and real-time tracking. Their research demonstrated

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the advantages of using machine learning algorithms to create efficiencies in the supply chain, which deliver substantial gains in inventory turnover, demand forecasting, and fast decision-making. Nonetheless, despite such technological innovations, the job of a personal physical shopper is necessary. This is primarily in the case of niche- or limited-edition products that might not be accessible online, where personal shoppers would have to seek, confirm, and buy these products on behalf of their customers. Together, these results further support the necessity of integrating AI technologies into frameworks such as OPS and OMS, pointing to possible directions for significant improvement in consumer experience, efficiency, and responsiveness to the market, acknowledging the need to integrate further and maintain the value of human-mediated personal shopping services. Table 2 summarizes the key findings from relevant literature related to OPS and OMS.

Table 2: Past Findings Related to Online Personal Shoppers (OPS) and Order Management System (OMS)

Author(s) & Year	Research Focus/Context	Key Findings	Methodology/Framework
Reddy & KGK (2016)	OMS in food services	OMS implementation increases accuracy and operational efficiency	Prototype development; Functional Testing
Indu & Das (2017)	Embedded OMS for restaurant services	Real-time OMS reduces transaction errors, improves reliability	Embedded system; SDLC development
Basir et al. (2018)	OMS for bakery ordering	Automation of Manual Processes, improved customer experience, and enhanced administrative efficiency	Prototyping, Functional testing
Kunath & Winkler (2019)	Usability of OMS	Improved usability design enhances OMS efficiency	Case study approach: usability evaluation
Ru et al. (2021)	Malaysian online purchase intentions	Perceived usefulness positively impacts purchase; trust is less critical	Quantitative survey; Technology Acceptance Model (TAM)
Lee & Kim (2023)	Korean Wave effects on e-commerce	Korean Wave significantly enhances consumer loyalty via OPS	Quantitative consumer survey
(Yeldan et al., 2024)	AI-driven system for optimizing order procurement and inventory	Enhance personalized shopping experiences by	AI-based design; empirical evaluation, machine learning algorithms to analyze

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	management in supply chains	ensuring product availability and timely procurement.	historical sales data, customer behavior, and market trends
(Patil, 2025)	How AI can enhance customer experience in retail and e-commerce	AI significantly enhances customer experiences in retail and e-commerce through personalized shopping experiences.	AI-powered recommendation engines utilize deep learning algorithms and predictive analytics.

In summary, previous literature extensively documents the benefits of OPS in enhancing consumer satisfaction, notably influenced by cultural dynamics such as the Korean Wave. Similarly, OMS has consistently proven essential for streamlining transactions, improving accuracy, and reducing errors in various business contexts. Nevertheless, existing research lacks a comprehensive exploration of integrated OPS-OMS solutions tailored to Malaysia and Korea's unique cross-border e-commerce challenges. This study directly addresses this research gap by providing practical contributions through designing, developing, and evaluating the ePERS platform, thus significantly enhancing knowledge and application in cross-border e-commerce management.

Research Methodology

This study aimed to design and develop a more efficient personal shopper e-commerce system for Malaysian consumers of Korean products. In software development, there are a variety of methodologies that can be applied, such as the Software Development Life Cycle (SDLC), which employs a stage-based approach (Ghumatkar & Date, 2023) the Waterfall Model, which uses a well-defined requirement approach (Saravanos & Curinga, 2023) Lean Software Development, which employs an optimizing efficiency approach;(Nurfajar et al., 2023) the V-Model for verification and validation (Ponce et al., 2021) Rapid Application Development (RAD), which focuses on a prototyping stage to gather user feedback (Murdiani & Sobirin, 2022) the Spiral Model, which involves risk management (Doshi et al., 2021) the Iterative and Incremental Model (Ibrahim, 2020), The Agile Methodology, which emphasizes flexibility (Roshan & Santhosh, 2021) the scrum methodology for progress monitoring (Verwijs & Russo, 2023) and the Kanban methodology, which visualizes the workflow (Lanza-León et al., 2021; Weflen et al., 2022). It is not uncommon to combine some of these methods to optimize throughput; for instance, a study by Fitriani et al. (2022) demonstrated the Agile methodology with the scrum framework, emphasizing rapid adaptation and development to change.

This study is situated within the discipline of Software Engineering, specifically applying structured methodologies from the system development lifecycle (SDLC). It addresses the practical problem identified by users (Malaysian personal shoppers purchasing Korean products online) by designing, developing, and evaluating a software prototype solution (ePERS). The adapted Waterfall Model provides a robust and systematic framework for structuring each development phase: system planning, analysis, design, development, testing, evaluation, and documentation. This structured approach ensures clarity, efficiency, and rigorous evaluation at each stage, in alignment with standard software development practices in the field. Figure 1 illustrates the stage or phase of the Waterfall Model.

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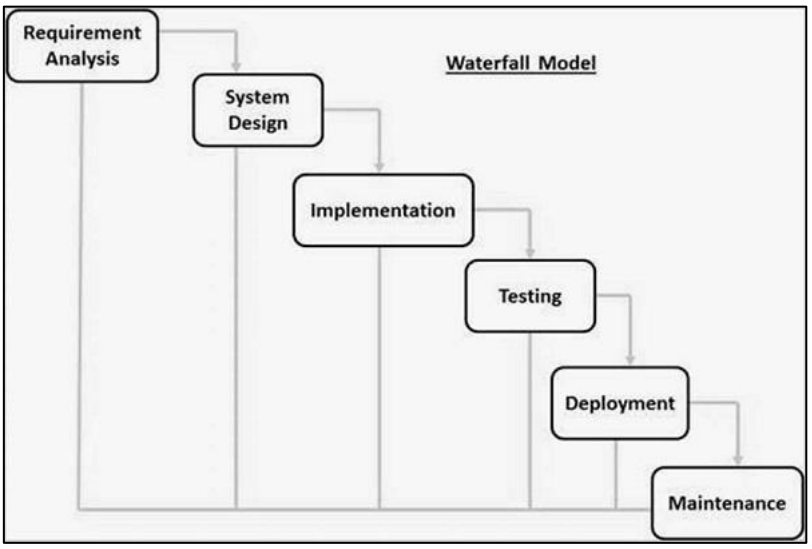

Figure 1: The Phases Of The Waterfall Model Methodology

Phase 1: System Planning

The system planning phase collects the system requirements through discussion sessions with stakeholders and targeted end users. The data obtained were used to design the required system specifications. A study conducted by Eltiana & Saputra (2024) emphasized the importance of needs analysis in e-commerce system planning, in which the targeted users' needs should be translated into specific system characteristics.

Phase 2: System Analysis

In the analysis stage, an in-depth analysis of the intended system model is conducted using relevant tools such as the Unified Modeling Language (UML). UML helps to visualize system interactions and structures. Hrytsenko et al. (2023) discussed business processes in systems using the IDEF0 model, indicating that precise modelling can help understand and document system requirements.

Phase 3: System Design

The main activities in this phase include database design, user interface (UI) design, and system architecture design. A data flow diagram (DFD) and context diagram were used to model the data flow in the system and the interaction between the user and the system. This design ensures the system can efficiently and effectively meet user needs. The system architecture layout includes the database design and the user interface. Eltiana & Saputra (2024) discussed a study that used the PHP programming language, MySQL as a Database Management System (DBMS), and XAMPP as a web server. A good system design ensures that the system meets all the functional and nonfunctional system requirements.

In developing ePERS systems, ERD is essential for modelling database data structures and entity relationships. In Figure 2, Profile, Customer, Order, Order Request, Order Items, Category, Product, and Admin are the leading entities described in the attached ERD. Each entity has a unique feature that demonstrates its unique nature. For example, a client entity consists of the ID, name, email, and password data. The link line shows how these entities interact. This type of relationship is either one-to-many or many-to-one. For example, a

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customer can place several orders containing many items. This ERD ensures a logical and practical layout of the data structures, allowing for efficient data management and system operation. The ERD used in this research methodology ensures that the ePERS system meets functional requirements accurately and operates effectively. Figure 2 presents the Entity Relationship Diagram (ERD) of the ePERS system.

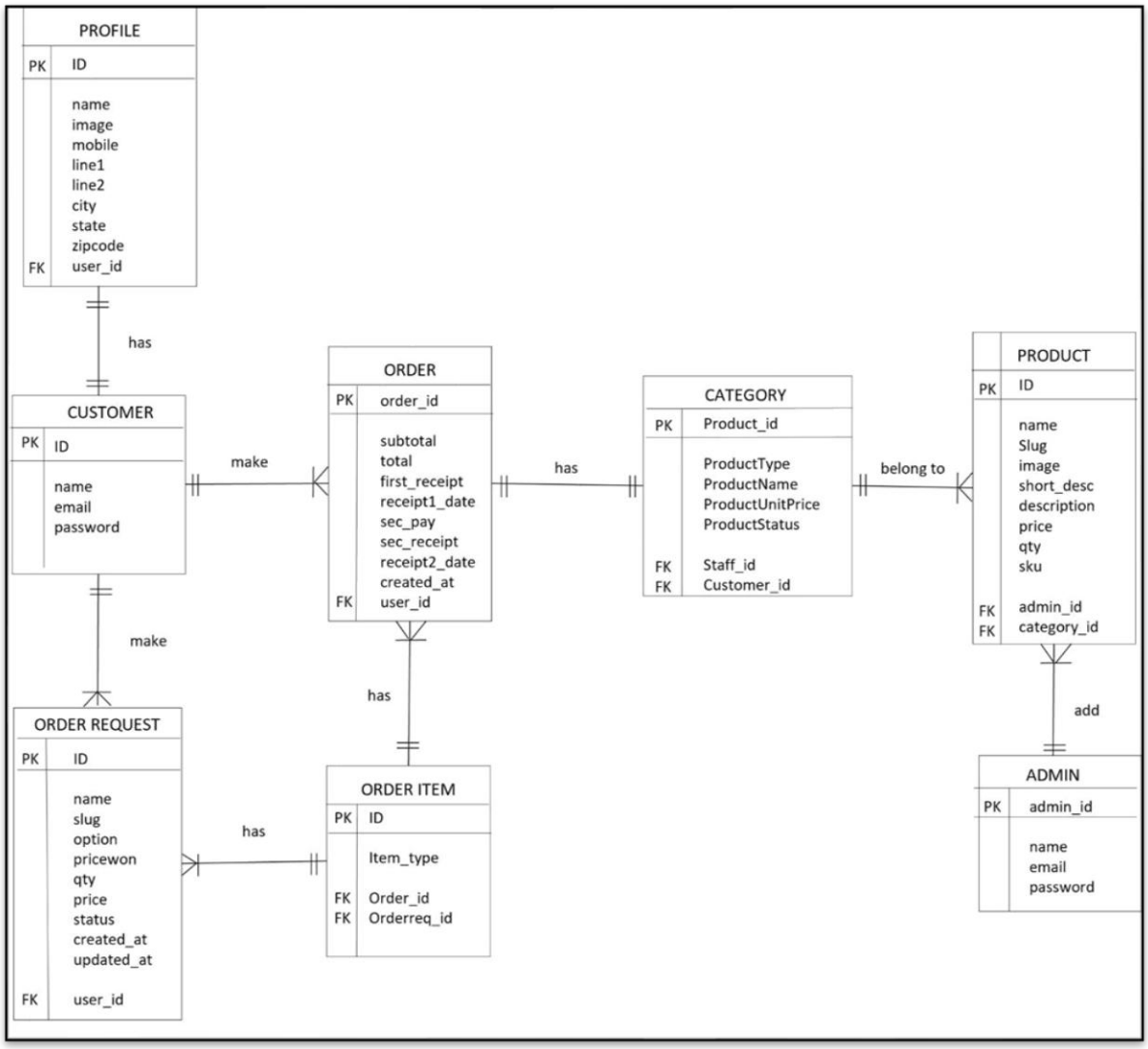

Figure 2: The ePERS Diagram

Phase 4: System Development

During the system development phase, coding and design implementations occur. Each module of the ePERS system was developed and tested carefully. Setiawan & Ardiansyah (2022), stated that waterfall methodology ensures that each construction phase is completed before moving on to the next phase.

Phase 5: System Testing and Evaluation

Any system is tested to ensure it works properly and meets all the user requirements. Unit testing, integration, and system testing are examples of such testing. Scenario tests were performed to ensure that the system operated under various conditions. A study by Delgado

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AIJBES
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(2020) suggested that combining Scrum methodology with prints helps make sales decisions and control inventory. This was applied for the testing and evaluation of the ePERS system.

Phase 6: System Documentation

All stages of the system development, from design to testing, were documented. Comprehensive documentation aids in system maintenance and provides a reference for future improvements. A study by Shakhatreh (2023) stated that high-quality documentation ensures compliance with financial standards and laws when developing e-commerce systems.

The development of the ePERS system relies on the modified Waterfall Model, which offers a clear structure for each phase of system development. This methodology ensures that all user requirements are met and the developed system works efficiently. This study demonstrates that using structured and systematic methods is crucial for successfully developing e-commerce systems.

Result and Discussion

This section presents the findings of the ePERS system development and implementation. This study aims to develop a system and evaluate the purchase orders made by Online Personal Shoppers (OPS), particularly for online purchases of Korean products. The results are organized into several subsections corresponding to the system's functional user interface (UI) design. These include business process improvements, user interface design, system flow, and system testing. This section also presents the findings of the study.

Business Process Improvement

Business process improvement is a technique used to identify and solve organizational inefficiencies to enhance the quality of work and the overall performance of business operations(Måren et al., 2020). This study addressed the challenges faced by Personal Shoppers in managing orders. A personal shop was interviewed to understand the business process flow. Figure 3 illustrates the current business process workflow for the Personal Shoppers. This process is considered high-risk due to inconsistent data entry and information errors, often resulting from manual order management. The workflow begins with a customer visiting a Korean online store and requesting a price quote. Admin then receives this request and provides a price quotation to the customer. Upon receiving this quotation, the customer decides to proceed with the order. If the customer chooses to proceed, then the customer pays for the order, and the Admin processes the payment. The order is then purchased from a Korean online store, sent to the Korean warehouse, and eventually shipped to the warehouse in Malaysia. After the package arrives in Malaysia, it is weighed, and a second invoice is sent to the customer for international shipping and local postage. The order was then delivered to the customer.

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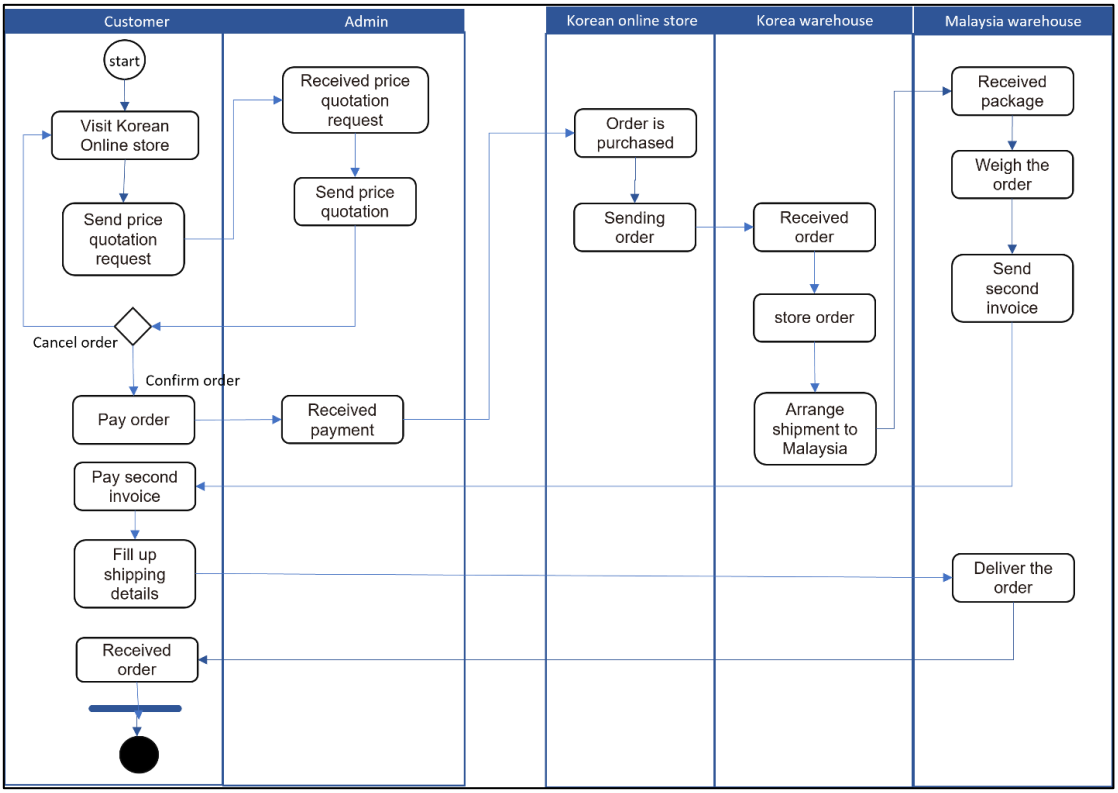

Figure 3: The Current Business Process Workflow for Personal Shoppers

The implementation of the ePERS system significantly improved business process flow, as shown in Figure 4. The ePERS system introduces a digital and web-based interface allowing customers to submit orders conveniently. This improvement addresses the inefficiencies and potential errors in the current manual process. One of the critical features of the ePERS system is the order request form, which enables customers to request items that are unavailable in the catalogue. The improved process begins when customers browse the catalogue and add desired items to their carts. They can submit an order request form if any desired product is unavailable. The Admin then evaluates and processes these requests, ensuring a seamless and efficient order-management system. In addition, customers can easily compare prices in Korean and Malaysian currencies, including service fees.

Customers must register and create user accounts to use the ePERS system. This registration process included providing personal information and setting up a profile. Once registered, customers can log in, browse the catalogue, and make purchases. With this system, the admin benefits from greater flexibility and ease of handling customer orders, allowing for efficient evaluation, acceptance, and order processing. Overall, the ePERS system streamlines the order management process, reduces the risk of data entry errors, and improves the overall efficiency and satisfaction of customers and Personal Shoppers.

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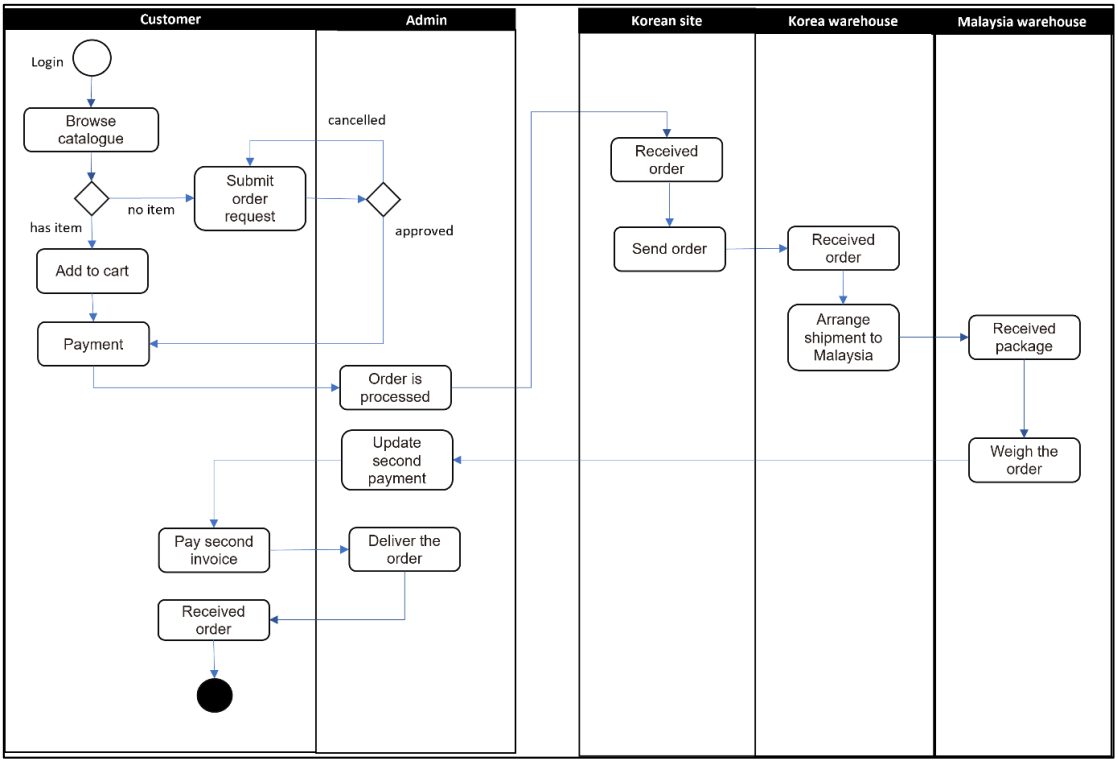

Figure 4: The Improved Business Process Flow

User Interface Design

This section presents the user interface for the ePERS system. The system was designed to manage order processing for Personal Shoppers of Korean products. Figure 5 shows the homepage of the ePERS system. The system has two leading user roles: user and system administrator. Customers must register their details before logging into the system. The Admin also logs into the system to manage orders. In addition, the system allows customers to monitor the status of their orders.

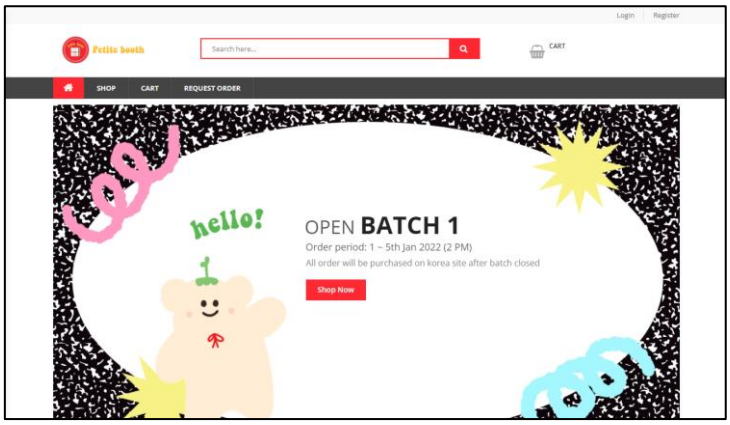

Figure 5: The ePERS Homepage

System Flow

As previously mentioned, the system has two leading user roles. This section discusses the system flow for customers and the Admin.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
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The User's System Flow

Users must create an account before logging into the system. They must fill in their names and email addresses and set their passwords. After registration is completed, users can log into the system. Once the login was successful, the system was redirected to the user's edit profile page. Users can upload their profile pictures, edit their names, and enter their personal information on the edit profile page, including phone numbers and mailing addresses.

After the registration process is complete, users can browse the shop catalogue. Users can click on each product to see its details. Users can add an item to their carts and check it after deciding to buy the product. The system's uniqueness is that users can request any item in the catalogue if the product is unavailable by filling out the order request form. Figures 6 and 7 show the shop catalogue page, product detail page, cart page, and request order form page.

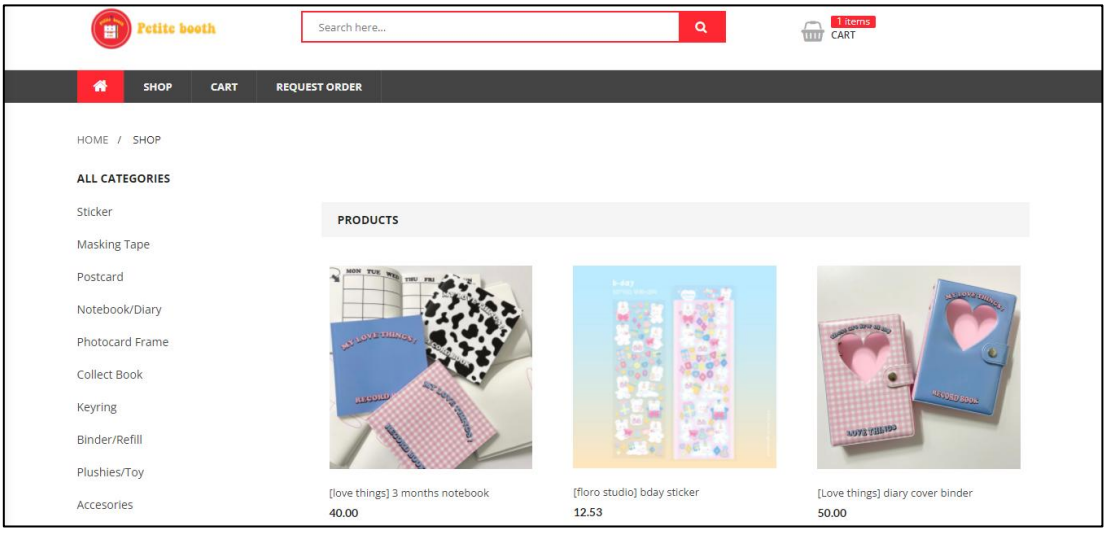

Figure 6: The Shop Catalogue Page

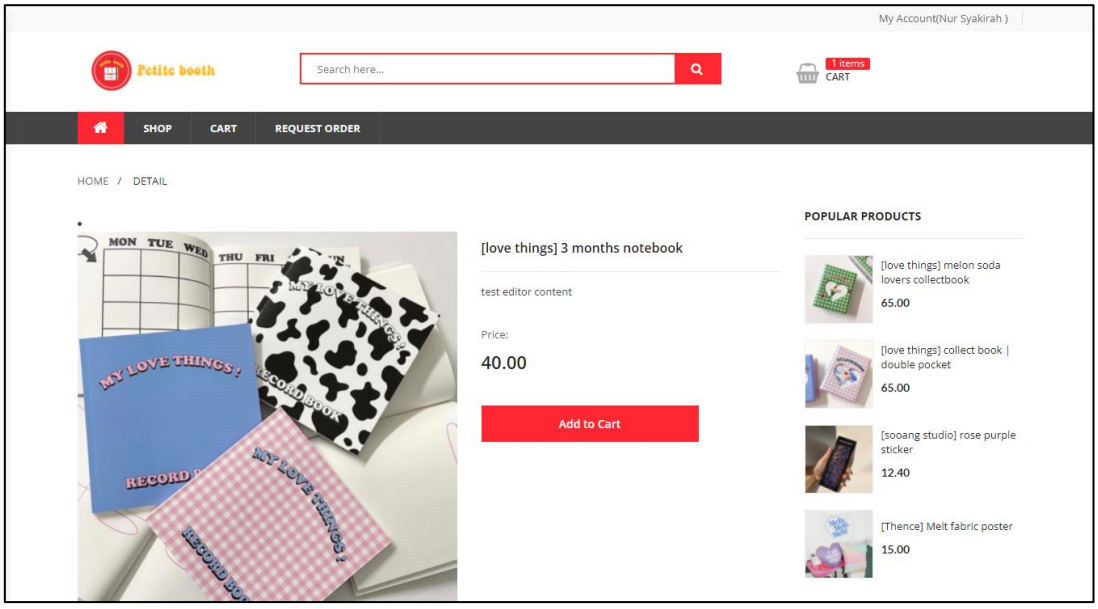

Figure 7: The Product Detail Page

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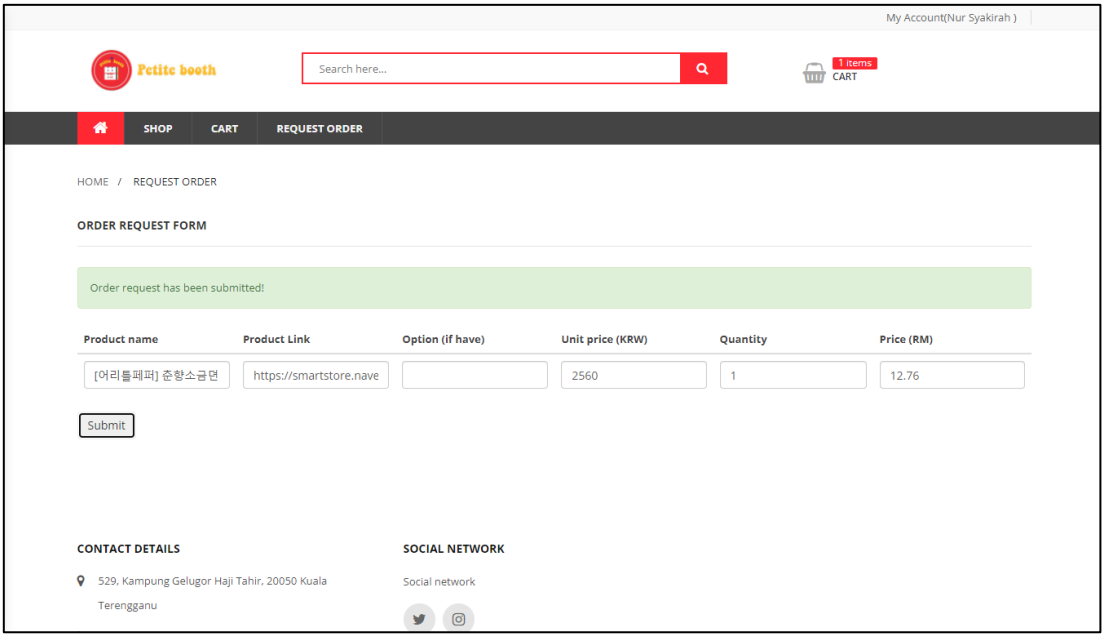

Figure 8: The Request Order Form

Figure 8 shows that the ePERS system is a unique e-commerce platform with unusual, special features compared to other e-trade systems. The main feature of this system is its ability to allow users to make special requests to buy products that are not in the catalogue. When users do not find their desired products in the catalogue, they can fill out an order request form and provide specific details about their desired products. Then, personal shoppers find and buy the desired products for users. This process enriches the user experience by providing more flexibility and a wider choice, ensuring they can obtain their desired products, and other e-commerce systems do not provide this option. This function increases customer satisfaction and adds value to the services offered by the ePERS, making it more attractive and competitive in the e-commerce market. With this function, the system can meet consumer demand more effectively, proving it to be a comprehensive and user-centric e-commerce solution.

Admin is required to approve the request-order form. After the item has been approved, users can proceed to checkout by clicking the "Pay" button, which will take them directly to the cart. Figure 9 shows the list of requested orders, with the "Pay" button appearing once the request is approved. The cart page shows the items in the catalogue and the items that were ordered separately. Figure 10 shows the cart page, which allows users to check the items.

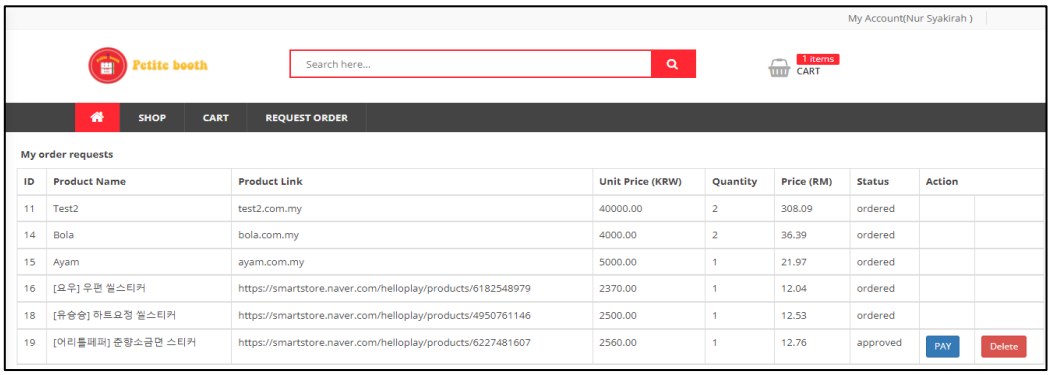

Figure 9: The List of Requested Orders

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 7 Issue 25 (September 2025) PP. 364-385
DOI 10.35631/AIJBES.725024

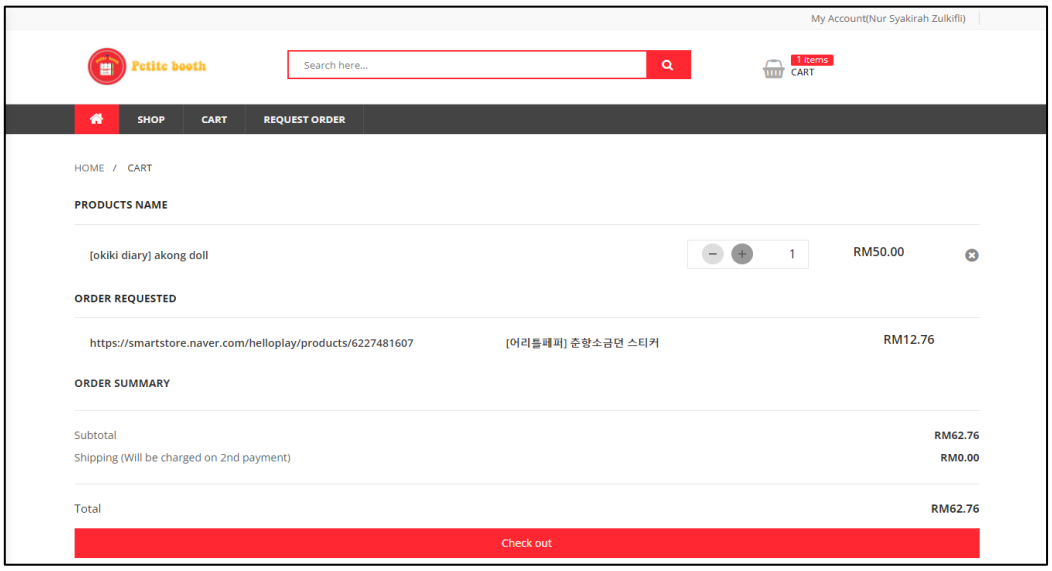

Figure 10: The Shopping Cart Page

When the order arrives in Malaysia, the Admin will update its status. The Admin updates the arrival date, and then the Admin enters the details of the arrival date. The ePERS system allows users to view the orders that they have placed. Users can view all the orders, orders that have arrived, and orders that have been delivered. There are three tabs concerning Orders: All Orders, Arrived Orders, and Delivered Orders. Figure 11 shows a list of orders.

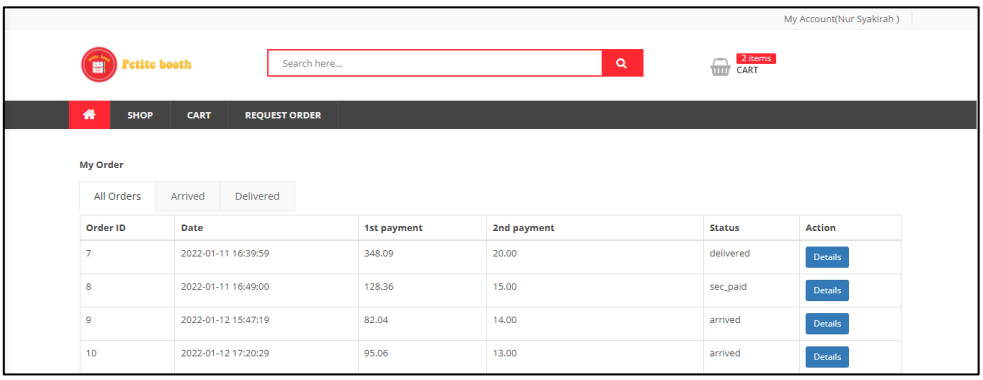

Figure 11: The Order Tabs and The List of All Orders, Arrived Orders, and Delivered Orders

The Admin's System Flow

Admin was also required to log into the system. Once the login was successful, the system was redirected to the admin dashboard. The dashboard displays the order request summary, the number of orders, and the products. In addition, Admin can view orders based on filters, latest orders, and monthly and yearly sales graphs. Figure 12 shows the dashboard page for Admin.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 7 Issue 25 (September 2025) PP. 364-385
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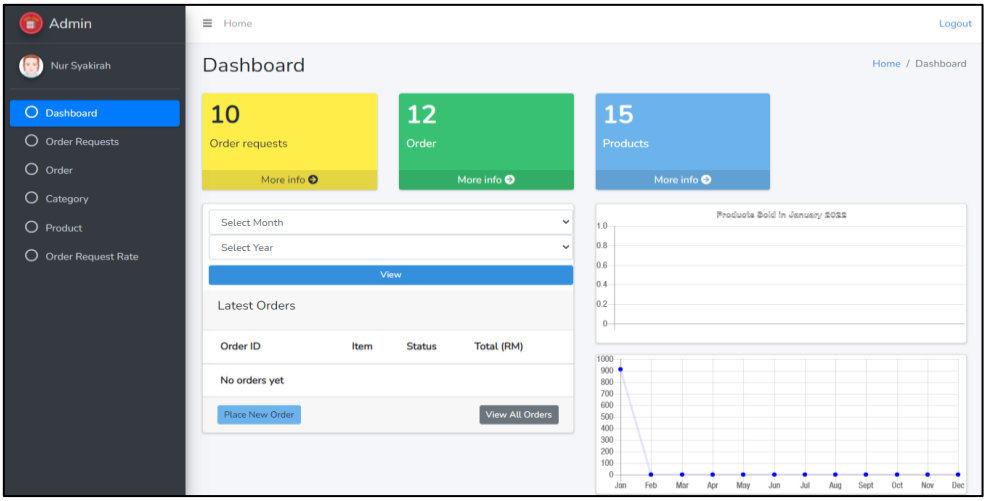

Figure 12: Admin Dashboard

The ePERS system also allows the Admin to manage the categories and products. Admin can add, edit, or delete any category or product. Every product can be assigned to any category, and the Admin can set the price for each product and its current quantity. Figure 13 presents a list of categories and products.

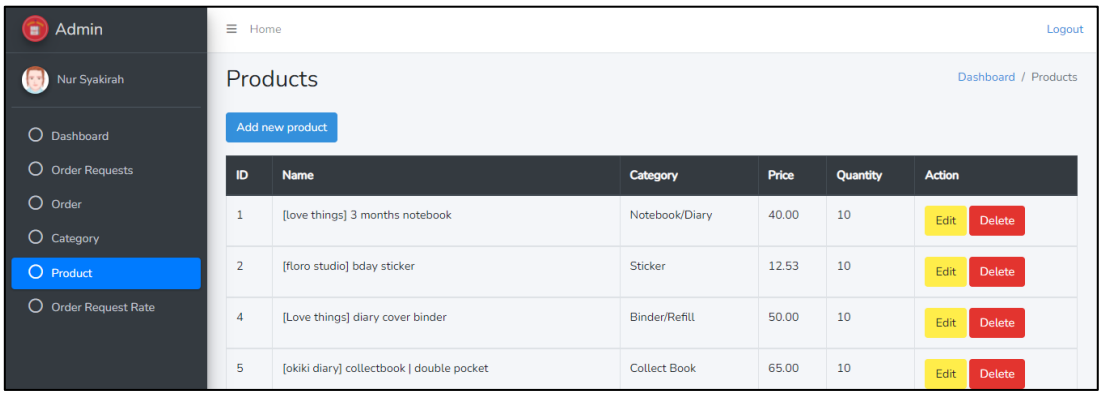

Figure 13: The List of Categories Page

The primary goal of the ePERS system is to manage customer orders efficiently. The Admin can manage and view orders. The orders are separated between "Order Request" and "Order." The order Request manages orders not listed in the catalogue (Figure 9). An order refers to the purchase of items listed in the catalogue. Admin can update the status of all orders, which is automatically updated from the users' list view. Figure 14 shows a list of order requests and pages.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 7 Issue 25 (September 2025) PP. 364-385
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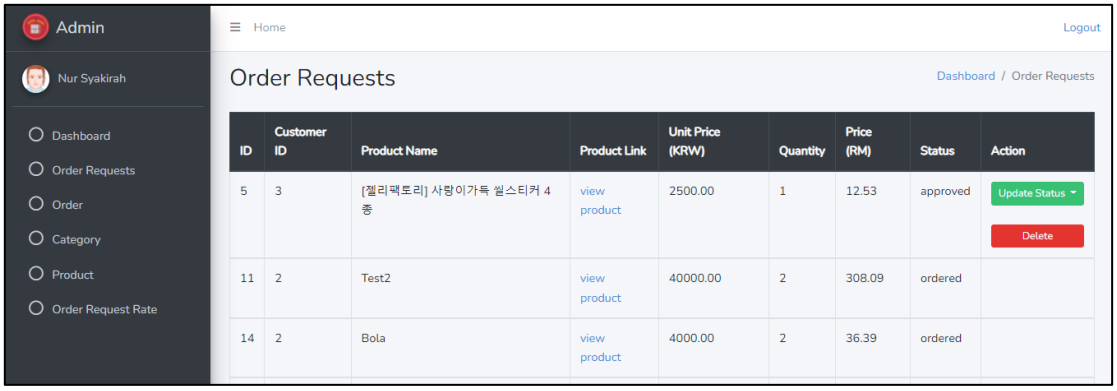

Figure 14: The Order Request Page

The ePERS system provides monthly and annual sales reports for reporting purposes. Admin can also view the sales analysis from the bar and line charts based on a specific month and year. The report is available on the dashboard page, as shown in Figure 15.

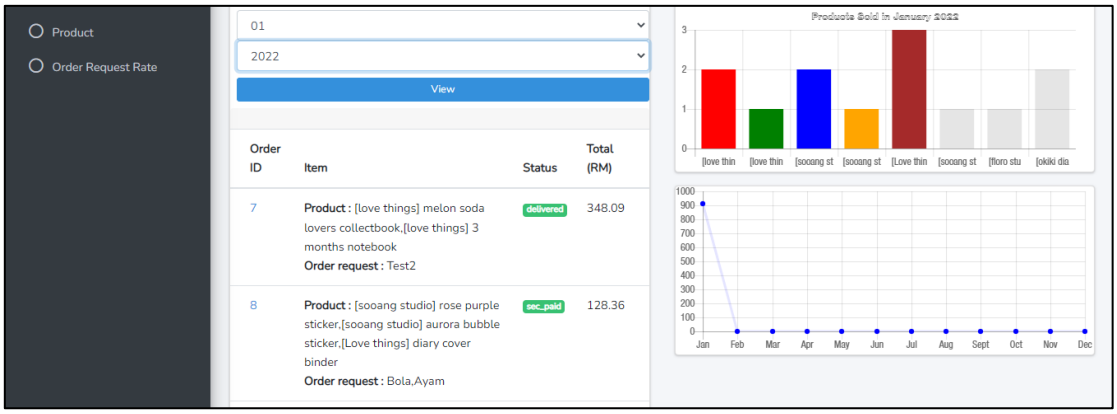

Figure 15: The Sales Report and Analysis

System Testing and Evaluation

Functional system testing was conducted in this study. Functional testing aims to verify that the application fulfils its specifications, focusing on the process outcome rather than the process itself. This approach avoids the assumptions made regarding the system structure. Various testing methods can be applied, such as creating test case scenarios based on programming details. Testing can be used to assess how effectively a system achieves its objectives.

There are two techniques for functionality testing, based on either requirements or business scenarios. The requirement-based testing encompasses all functional specifications and is the basis for all tests. In contrast, business-scenario-based testing provides insights into the system from a business process perspective. Functionality testing was performed based on the business scenario technique. Several business scenarios were created. Each scenario consisted of several test cases. Table 3 shows the test case template used for functionality testing.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 7 Issue 25 (September 2025) PP. 364-385
DOI 10.35631/AIJBES.725024

Table 3: The Test Case Template

Test Case ID		**Test Case Description**			
Created By		**Reviewed By**		**Version**	
QA Tester's Log					
Tester's Name		**Date Tested**		**Test Case (Pass/Fail/Not Executed)**	
S #	**Prerequisites:**		**S #**	**Test Data**	
1.			1.		
Test Scenario					
Step #	**Step Details**	**Expected Results**	**Actual Results**	**Pass/Fail/Not Executed/ Suspended**	
1.					
2.					
3.					

This study created four scenarios: ordering process, request order process, addition of new products, and order status update. The first scenario concerns a new user ordering. The test cases involved the user registering for an account, the user logging into the system, and the user placing an order. The second scenario was a request-order process. Only one test case was used for this scenario: the user requested the order process. The third scenario is Admin, in which a new product is added. The two test cases involved Admin logging into the system and adding a new product. The final scenario is the order-status update, and there is one test case. All the test cases run for the functionality testing passed, as shown in Table 4. The testing process validated all the essential functional requirements of the ePERS system. Both customer-facing and administrative components were performed as intended. Testers successfully registered new users, placed orders, submitted custom requests, and completed transactions. Administrators can efficiently manage product listings and update order statuses. All scenarios resulted in **"Pass"** outcomes, indicating that the system met operational expectations for reliability and usability. These results demonstrate the system's readiness for deployment in a real-world e-commerce setting.

Table 4: System Testing Summary Result

Scenario	Test Cases	Expected Outcome	Actual Outcome	Status
New Customer Registration	Account creation: user registration	Successful registration and customer data stored correctly	Successfully registered and data stored	Pass
Customer Login	Log in with registered credentials	Successful login with correct credentials	Login successful	Pass
Customer Order Placement	Browse product, add to cart, checkout	Order placed successfully, receipt uploaded	Order successfully placed	Pass

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 7 Issue 25 (September 2025) PP. 364-385
DOI 10.35631/AIJBES.725024

Requesting Order Process	Submit a request for an unavailable product	Special order request processed correctly, data stored accurately	Special order request successfully processed	Pass
Admin Login	Admin authentication process	Admin login successful and correct redirection	Admin successfully logged in	Pass
Admin Adding New Product	Add product details and store them in the catalogue	Product successfully added to the catalogue and database	Product successfully added	Pass
Admin Update Order Status	Admin changes order status (Approved/Cancelled)	Order status successfully updated and notification displayed	Order status successfully updated	Pass

Discussion

This study addresses Malaysian consumers' challenges when purchasing online Korean products through personal shopping services. Implementing the ePERS system significantly improves the efficiency of the order-management process and streamlines the workflow for administrators and customers. The findings from this study demonstrate that the ePERS system effectively addresses the limitations of traditional personal shopper services, such as manual order tracking, communication inefficiencies, and lack of transparency in pricing.

One key improvement brought about by the ePERS system is the automated handling of orders and customer information. By transitioning from manual data entry and order management via Google Forms and Excel to a web-based system, the risk of data entry errors and inconsistencies was significantly reduced. This aligns with studies by Måren et al. (2020) highlighting how digital transformation in order management systems leads to more accurate data handling and improves business process outcomes. Table 5 compares the results before and after the implementation of the ePERS system. Furthermore, customers' ability to request items not listed in the catalogue and convert prices into local currency enhances the user experience. Using the ePERS system, customers can track their orders in real time, providing greater transparency and building trust in the service. This is supported by research Saleh et al. (2023), which emphasizes customer empowerment and transparency in online shopping.

The system functionality testing section describes the core functions of the system, comprising individual test case plans and scenarios for each function. These test cases were designed to ensure the system's functionality aligned with specified requirements. The results obtained from the test cases were expected to demonstrate the system's functionality following the established requirements. However, this study has some limitations that must be acknowledged. Although the system testing results were positive, further research is needed to assess the system's long-term impact on business performance, especially regarding customer retention and operational efficiency.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
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DOI 10.35631/AIJBES.725024

Table 5: The Comparisons of Before and After the Implementation of ePERS

Process	Before implementing ePERS	After implementing ePERS
Customer Information	Customer information is collected through Google Forms. The customers fill out their shipping details when the items arrive in Malaysia.	Customer information is maintained in a database, and the system enables customers to edit their information.
Ordering	The Admin records all order activities and statuses manually using Microsoft Excel.	ePERS enables customers to submit their orders digitally using a web-based interface. Every order received from the customers will be entered into the system, making it easy for the Admin to keep tabs and update on the progress of the orders.
Payment	Customers send proof of receipts through direct messages on Instagram or Twitter chats, making it difficult for the Admin to track the payment.	ePERS allows the customers to upload the proof of receipts under the order details, which are automatically recorded in the database, allowing the Admin to review and approve the payment quickly.

Moreover, the system currently lacks integration with financial and logistical systems, which is crucial for improving the automation and overall functionality of the ePERS platform. Previous studies Gadjong (2023) suggest that integrating such systems can further enhance their capacity to handle larger orders, improve financial tracking, and provide better logistical support. While the ePERS system represents a significant step forward in improving the personal shopping experience for Malaysian consumers purchasing Korean products, there is potential for further refinement and enhancement. Future developments can include the integration of augmented Reality (AR) and virtual reality (VR) technologies to further personalize the shopping experience, in line with the recent technological advancements in the e-commerce industry(Saleh et al., 2023).

Conclusion and Recommendation

The key objective of this study is to develop and test the personal shop e-commerce Application of Korean products (ePERS) to improve Malaysian consumers' access to Korean goods. The system overcomes various shortcomings of the old method of direct purchasing and personal shoppers, such as inefficiencies concerning the time lag in communications, lack of transparency, and a limited payment system (Korean websites). ePERS combines ePERS online personal shop (OPS) capabilities with an Order Management System (OMS), allowing users to register, place orders, request unavailable items, and track purchase status in a seamless, structured, and user-friendly environment.

The testing process of the system proved that all essential modules, such as customer registration, login, ordering, special requests, and administrative actions, delivered the required functional outcomes, and all test cases were passed successfully. Such findings indicate how ePERS can improve e-commerce processes and user experience by automating them, updating them in real time, and making order processing easier. This research adds value to the literature

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
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Volume 7 Issue 25 (September 2025) PP. 364-385
DOI 10.35631/AIJBES.725024

on e-commerce system development because it provides an e-commerce prototype that fits cross-border buying habits and is complemented with practical aspects that coincide with consumer needs and operational necessities. In addition, it sheds light on how OPS and OMS can be combined into a unified one in a niche e-commerce segment to form a basis for future academic and technical studies.

However, certain limitations of this study remain. The system was developed and tested under simulated conditions and limited user scenarios. Real-time integration with Korean retail databases and payment gateways will remain an enhancement. Additionally, while AI features, such as predictive personalization, are emerging on similar platforms (Patil, 2025), they are not yet fully implemented in ePERS. Physical shopping support is also necessary for products unavailable online, underscoring the continuing relevance of traditional personal shopper roles.

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