

Original Research

An Integrated Web-Based Sales Information System for Original Second-Hand Footwear: A Prototype-Based Case Study of PT. Taria_2ndshoes

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ABSTRACT

The sale of original second-hand footwear requires transparent and well-organized product information because each item may differ in physical condition, size, appearance, availability, and level of wear. At PT. Taria_2ndshoes, product promotion and customer communication were previously conducted primarily through social media and private messages, resulting in product, stock, payment, transaction, and reporting information being distributed across separate channels. This study aimed to design and implement a web-based shoe sales information system using the Prototype method and to evaluate its principal functions through black-box testing. The development process comprised requirements identification, rapid design, prototype construction, evaluation, system development, and functional testing. The implemented application integrates customer and administrator workflows, including product catalog access, search and category filtering, registration, authentication, shopping cart, checkout, payment-proof submission, product management, transaction management, user management, and sales reporting. The system was developed using PHP, CodeIgniter 3, MySQL, HTML, CSS, Bootstrap, and XAMPP. Functional testing consisted of 25 predefined scenarios, including 15 valid-input and 10 invalid-input scenarios. All 25 scenarios produced the expected responses, resulting in a functional test pass rate of 100%. The findings demonstrate that the proposed system provides an integrated workflow connecting item-level footwear information, customer product discovery, purchasing activities, transaction administration, and period-based sales reporting. The contribution is contextual and functional, specifically addressing the information-management requirements of original second-hand footwear sales. The evaluation was limited to functional testing; usability, performance, security, scalability, and concurrent-access behavior require further quantitative investigation in future studies.

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1 INTRODUCTION

The digitalization of retail activities has increasingly changed how small and medium-sized businesses present products, communicate with customers, and manage transactions. In footwear retail, web-based sales systems provide an opportunity to extend product accessibility beyond physical stores while organizing product, customer, and transaction information in a structured environment. Previous research has demonstrated the feasibility of website-based shoe sales systems for small and medium-sized enterprises, particularly for expanding market reach and providing customers with access to product information without requiring direct visits to the store [1]. More recent studies have similarly developed web-based e-commerce systems to address limited online

marketing, manual purchasing processes, and fragmented sales and inventory records [3].

However, the information requirements of second-hand footwear differ from those of conventional new-product retail. A second-hand shoe is an individual physical item whose condition may vary even when the model or brand is identical. Information concerning size, color, level of wear, outsole condition, upper condition, cosmetic defects, availability, and visual appearance therefore becomes an important part of the purchasing decision. Consequently, a digital sales system for second-hand footwear should not merely provide a product catalog and ordering mechanism, but should also support the structured presentation and administration of item-specific information. This characteristic creates a specific information-management requirement that is not sufficiently addressed by generic e-commerce implementations [1].

The need for an integrated sales environment is particularly relevant to PT. Taria_2ndshoes. Before the development of the proposed system, product promotion and customer communication were primarily conducted through social media and private messaging. Although these channels were useful for promotional purposes, product information, stock availability, customer inquiries, payment evidence, order status, and sales records were distributed across separate communication processes. Such fragmentation makes it difficult to maintain consistent product information and trace the complete transaction lifecycle. The problem is consistent with previous studies reporting that manual or non-integrated sales processes can create limitations in customer access, inventory management, transaction recording, and sales administration [2, 3]. The Prototype-based e-commerce study by Hapsah and Hanif, for example, addressed the absence of an online sales platform and the lack of integrated sales and inventory records, while the study by Wardhani and Nevandri demonstrated the use of a Prototype approach for addressing manually managed customer and transaction processes in a shoe-related business context [2, 3].

Previous research has also specifically investigated web-based shoe sales. Zachy et al. developed a website-based sales information system for shoe MSMEs to support product promotion and expand market reach [1]. More recently, Al Farizi and Voutama developed a web-based shoe sales system for MAF Clobber using UML and the Waterfall model, providing functions for product search, ordering, online payment, customer management, and sales reporting [15]. These studies demonstrate that digital systems can support footwear sales; however, their primary emphasis is on general shoe retail and system development. The present study addresses a different operational context by focusing on the management of original second-hand footwear, in which product-level condition and availability are inherently more variable and therefore require more explicit information management.

The research gap can consequently be identified at two levels. First, existing website-based shoe sales research predominantly treats footwear as conventional retail products, whereas second-hand footwear requires more detailed and transparent item-level information because each available pair may have a different physical condition and cannot always be treated as an interchangeable stock unit. Second, previous e-commerce and shoe-sales studies generally emphasize online marketing, purchasing, transaction processing, or software modelling, while the present research integrates these functions into a single workflow specifically adapted to the operational needs of a second-hand shoe business. This distinction is important because the value of the proposed system is not simply the availability of an online store, but the integration of product information, product availability, customer purchasing, payment verification, transaction-status monitoring, and sales reporting within the same information system.

Another consideration concerns the development process. Hapsah and Hanif [3] demonstrated that the Prototype method can be used to develop a website-based e-commerce system by incorporating user evaluation into the design process. Wardhani and Nevandri [2] likewise applied the Prototype method in a shoe-related service system and reported that the approach supported the development of customer and transaction management functions. In the present study, Prototype is therefore positioned not as a methodological novelty, but as a development mechanism for translating the specific operational requirements of PT. Taria_2ndshoes into customer-facing and administrator-facing functions. The iterative process was used to refine the structure of product presentation, shopping, checkout, payment-proof submission, transaction monitoring, product administration, and reporting before final implementation.

The resulting system extends beyond a basic product-promotion website. On the customer side, it provides product discovery, search and category filtering, account registration and authentication, shopping cart, checkout, and payment-proof submission. On the administrative side, it provides category management, product management, user management, transaction monitoring, and period-based sales reporting. The system therefore establishes a continuous information flow from product publication to transaction recording and administrative

reporting. This integrated workflow is particularly relevant to second-hand footwear because product status, stock availability, product condition, and transaction status must remain synchronized to avoid inconsistencies between promotional information and actual sales records.

The contribution of this research is therefore the design and implementation of an integrated web-based information system specifically contextualized for original second-hand footwear sales at PT. Taria_2ndshoes. Unlike previous studies that focus primarily on general shoe retail, shoe services, or generic e-commerce implementation [1–3], the proposed system combines item-level product information with catalog access, transaction processing, payment-proof handling, order-status monitoring, inventory administration, and sales reporting in one operational workflow. The contribution is consequently contextual and functional rather than the introduction of a new software-development algorithm or testing technique. The study also provides empirical functional verification through 25 black-box scenarios covering both valid and invalid inputs, allowing the implemented workflow to be evaluated against predefined system requirements.

Based on this context, the objective of this research is to design and implement a web-based shoe sales information system for PT. Taria_2ndshoes using the Prototype development method and to evaluate its principal functions through black-box testing. The research specifically investigates whether the proposed system can organize product information, customer access, purchasing activities, payment evidence, transaction monitoring, product administration, and sales reporting into an integrated digital workflow. Through this approach, the study contributes a practical information-system model for the digital management of second-hand footwear sales while identifying the functional requirements that distinguish this business context from conventional online shoe retail.

2 RESEARCH METHODS

2.1 Research Design and Requirement Identification

The research used an applied system-development design. Requirements were identified from the sales process at PT. Taria_2ndshoes, including customer registration, authentication, product catalog access, product search, shopping cart, checkout, payment evidence, order monitoring, category management, product management, user management, transaction management, and sales reporting. The application was developed as a web system using PHP, CodeIgniter 3, MySQL, HTML, CSS, Bootstrap, and XAMPP [7].

The interface requirements were organized so that customer pages and administrator pages had distinct operational purposes. HTML and CSS were used to structure and present web content, while the design emphasized readable forms, clear navigation, and consistent information placement across the application [8].

2.2 Prototype Development Procedure

The Prototype procedure consisted of requirements collection, rapid design, prototype construction, user evaluation, system development, and testing. During evaluation, the initial form and page structures were reviewed against the expected sales workflow. Revisions were made before the prototype was developed into the implemented application [9].

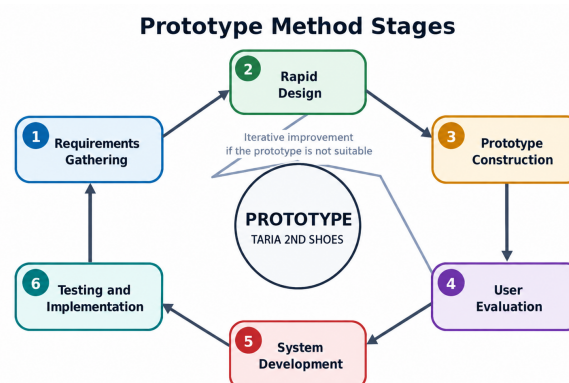


Figure 1. Prototype Development Stages Used in the Research

Iterative evaluation is central to the Prototype method because user feedback is used to refine navigation, form content, and process sequencing before development is considered complete. This characteristic supports application development when the required interaction is easier to validate through a working model than through textual requirements alone [3].

2.3 System Modelling and Implementation Technology

UML was used to describe actor interaction, activity flow, sequence communication, and class structure. The modelling process distinguishes administrator functions from customer functions and provides a visual basis for translating requirements into software modules [10].

Use case and activity modelling were employed to explain the relationship between users and system functions, including login, registration, product selection, transaction processing, and administrative data management. These models help maintain consistency between functional requirements and the implemented workflow [11]. Class-oriented modelling was also used in the source research to describe the main application entities and their relationships. In the journal version, the discussion retains the functional system structure required to explain application operation [12].

The server-side application was implemented with PHP and the CodeIgniter framework. This framework structure separates application logic, data processing, and interface presentation so that sales modules can be developed and maintained in a systematic form [13].

The web application architecture also uses framework-based development to organize routing, request handling, form processing, and presentation of stored transaction information. This structure supports modular development of customer and administrator functions [14].

2.4 Functional Testing

Functional testing was conducted using a black-box testing approach to verify whether the implemented system functions according to the specified functional requirements. Black-box testing evaluates system behavior based on input and observable output without examining the internal source code. The test scenarios covered the main customer and administrator functions, including page access, product search, user authentication, account registration, category management, product management, shopping cart operations, checkout, payment-proof submission, transaction management, user management, sales reporting, and logout. Both valid and invalid input conditions were included to evaluate whether the system produced the expected responses under normal and erroneous conditions [15].

For each test scenario, the actual system response was compared with the predefined expected response. A test case was classified as passed when the observed output corresponded to the expected result, whereas a test case was classified as failed when the observed behavior differed from the predefined expectation. For invalid-input scenarios, rejection of incomplete, duplicate, unavailable, or unsupported data was considered a successful result when such rejection was the expected system behavior [16–20].

The functional test success rate was calculated using the following equation:

$$\text{Functional Test Success Rate (\%)} = \frac{N_{\text{passed}}}{N_{\text{total}}} \times 100\% \quad (1)$$

where N_{passed} represents the number of test scenarios that produced the expected response and N_{total} represents the total number of executed test scenarios.

The same calculation can also be applied separately to valid-input and invalid-input scenarios:

$$\text{Pass Rate}_g(\%) = \frac{N_{\text{passed},g}}{N_{\text{tested},g}} \times 100\% \quad (2)$$

where g represents the test group, namely valid-input or invalid-input scenarios.

In this study, 25 test scenarios were executed, consisting of 15 valid-input scenarios and 10 invalid-input scenarios. All 25 scenarios produced the expected system responses. Therefore, the overall functional test success rate was:

$$\text{Functional Test Success Rate} = \frac{25}{25} \times 100\% = 100\% \quad (3)$$

For the valid-input scenarios:

$$\text{Pass Rate}_{\text{valid}} = \frac{15}{15} \times 100\% = 100\% \quad (4)$$

For the invalid-input scenarios:

$$\text{Pass Rate}_{\text{invalid}} = \frac{10}{10} \times 100\% = 100\% \quad (5)$$

Thus, all predefined functional test scenarios matched their expected responses. The result indicates that the implemented functions operated according to the specified test conditions. However, this result should be

interpreted specifically as functional test-case compliance and should not be interpreted as evidence of overall system quality, usability, security, performance, or reliability, which require separate evaluation procedures.

3 RESULTS AND DISCUSSION

3.1 Home Page Implementation

The home page serves as the initial interface presented to customers when accessing the PT. Taria_2ndshoes website. It is designed to provide an immediate overview of the business, introduce the available footwear products, and direct users toward the main functions of the system. The interface contains the store identity, navigation menu, authentication controls, promotional information, and a direct link to the product catalog. The implemented home page is presented in Figure 2.

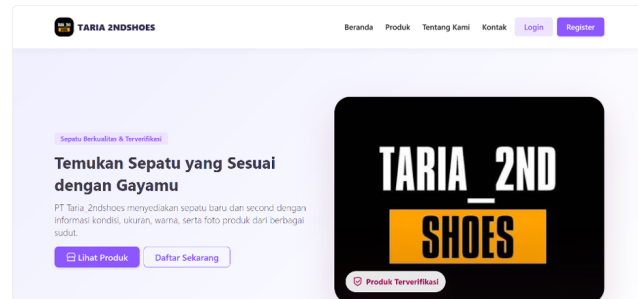


Figure 2. Home Page of PT. Taria_2ndshoes

The home page provides two primary entry points for customers: product exploration and account access. The “Lihat Produk” button directs users to the product catalog, allowing them to browse the available footwear, while the “Daftar Sekarang” and “Login” controls provide access to the customer account functions. The navigation menu also provides direct access to the Home, Products, About Us, and Contact sections.

The visual presentation emphasizes that PT. Taria_2ndshoes offers both new and second-hand footwear, with product information intended to support customers before proceeding to a transaction. The promotional section and product-oriented call-to-action reduce the number of steps required to reach the catalog and establish the home page as the initial connection between product promotion and the subsequent purchasing workflow.

From a system perspective, the home page does not perform the transaction itself; rather, it functions as the entry layer of the integrated sales workflow. Customers are introduced to the business through the landing page and can subsequently move to product discovery, authentication, shopping cart, checkout, payment-proof submission, and transaction monitoring. This structure connects the promotional function of the website with the transactional functions implemented in the subsequent system modules [21].

3.2 Product Catalog Implementation

The product catalog serves as the main product-discovery interface for customers. This page organizes the footwear offered by PT. Taria_2ndshoes into a searchable catalog so that customers can identify products based on relevant information before proceeding to the purchasing process. The interface provides a keyword search field, category filter, and search control, while the available products are presented through product cards. The implemented product catalog is shown in Figure 3.

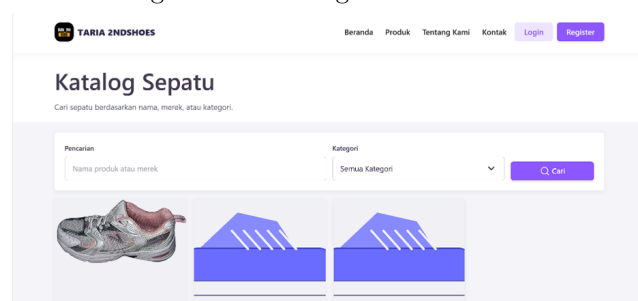


Figure 3. Product Catalog Page

The catalog provides two mechanisms for product discovery. First, customers can enter a product name or brand through the search field. Second, the category filter can be used to narrow the displayed products according to the selected category. The combination of keyword-based search and category filtering enables customers to locate relevant products without relying on direct communication with the administrator.

The product cards provide the visual entry point for examining individual footwear products. This function is particularly relevant to second-hand footwear because customers need to evaluate the available item before continuing to the transaction stage. In contrast to a conventional retail catalog in which products of the same model may represent interchangeable stock, second-hand footwear may differ in availability and physical condition. Therefore, the catalog functions not only as a promotional interface but also as an information-access layer within the sales system.

From an operational perspective, the catalog connects the product-management module maintained by the administrator with the customer-facing purchasing workflow. Product information entered and maintained by the administrator becomes available through the catalog, allowing customers to discover available footwear before adding products to the shopping cart and proceeding to checkout. This connection reduces dependence on individual product inquiries through private messaging and contributes to a more structured product-to-transaction workflow.

3.3 Product Management Implementation

The product management interface provides administrators with a centralized environment for managing footwear information used by the customer-facing catalog. The interface organizes product records according to product name, brand, category, price, stock, and status. It also provides search and category-filtering functions and an option to add new products. The implemented product management interface is presented in Figure 4.

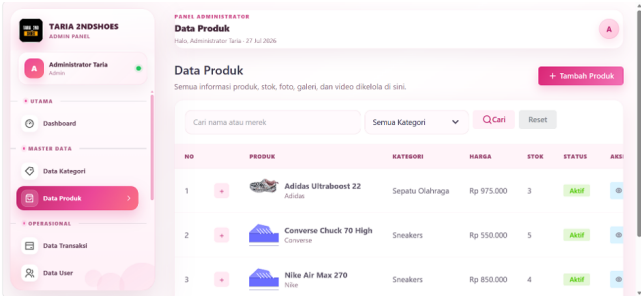


Figure 4. Product Management Page

As shown in Figure 4, the administrator can access and manage the footwear records through a structured tabular interface. Each record contains essential product attributes, including the product name, brand, category, price, stock quantity, and product status. The interface also provides keyword-based search and category filtering, allowing administrators to locate specific product records more efficiently.

The “Tambah Produk” function enables the administrator to add new footwear records to the system, while the available action controls provide access to further product operations. The displayed stock and status information allow administrators to distinguish products that are currently available from those whose availability may require further management.

This module plays an important role in maintaining consistency between administrative records and the customer-facing catalog. Product information maintained through the administrator panel becomes the basis for product information presented to customers during product discovery and subsequent purchasing activities. Consequently, changes to product attributes, stock availability, and status can be managed from a centralized location rather than through separate promotional or communication channels.

For second-hand footwear, centralized product management is particularly important because each available item may have distinct characteristics and availability. Therefore, the product management module supports the proposed system’s item-level information management, connecting administrative product records with the customer-facing catalog and the subsequent transaction workflow.

3.4 Transaction Management Implementation

The transaction management interface provides administrators with a centralized view for monitoring customer orders and their associated transaction information. The interface is designed to organize transaction records based on transaction code, customer, transaction date, total payment, payment method, and transaction status. A search field and status filter are also provided to facilitate the identification of specific transactions. The implemented transaction management interface is presented in Figure 5.

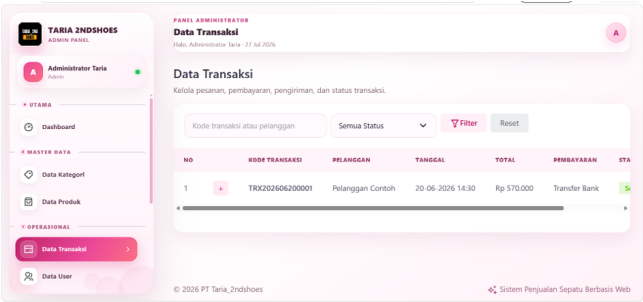


Figure 5. Transaction Management Page

As shown in Figure 5, the transaction management page presents customer orders in a structured table containing the transaction code, customer information, transaction date, total payment, payment method, and transaction status. The transaction code provides a unique reference for each recorded order, while the status field enables administrators to distinguish transactions according to their current processing stage. The interface also provides a keyword-based search function and a transaction-status filter. These functions allow administrators to locate specific orders without manually reviewing the entire transaction dataset. Consequently, transaction monitoring can be performed through the application rather than through separate private-message conversations or manually maintained records.

The transaction module represents the connection between the customer purchasing process and administrative order management. Product information maintained in the product management module is used during the purchasing process, while completed orders are subsequently recorded in the transaction module. This creates a traceable flow from product selection to transaction administration.

For second-hand footwear sales, transaction traceability is particularly relevant because product availability can change at the individual-item level. Once an item is associated with an order, its transaction status can be monitored through the system, helping administrators distinguish active, pending, processed, completed, or cancelled transactions according to the implemented workflow.

The transaction management module therefore extends the proposed system beyond product presentation. It provides an operational control layer in which customer orders and payment-related information can be centrally recorded and monitored. This integration contributes to the overall workflow of the system by connecting product information, customer purchasing activities, and administrative transaction records within a single web-based application.

3.5 Sales Report Implementation

The sales reporting interface provides administrators with a summarized view of transaction and sales information recorded by the system. The page is designed to present key indicators, including revenue, number of transactions, number of products, and number of customers, together with detailed transaction records. A date-range filter is also provided to allow administrators to display sales information for a specific period. The implemented sales reporting interface is presented in Figure 6.

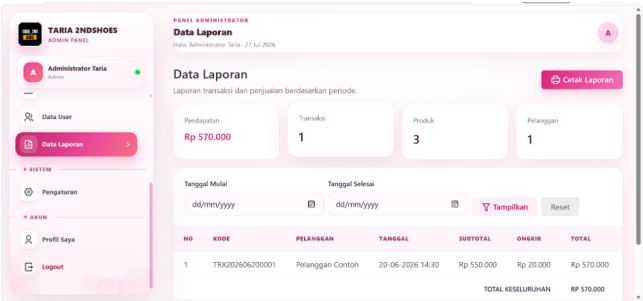


Figure 6. Sales Report Page

As shown in Figure 6, the reporting page summarizes the sales information stored in the system through several key indicators. The interface displays revenue, transaction count, product count, and customer count, providing an overview of sales activity within the selected reporting period. The detailed transaction table further presents the transaction code, customer, transaction date, subtotal, shipping cost, and total payment. The date-range controls allow administrators to specify a start date and an end date before displaying the corresponding transaction records. This function enables sales information to be examined according to a defined

period rather than requiring administrators to review individual transactions manually. The “Cetak Laporan” function also provides an option to produce a printable version of the displayed report for administrative documentation.

The reporting module represents the final stage of the information flow implemented in the proposed system. Transaction records generated through customer purchasing activities and managed through the transaction module are transformed into summarized operational information. Thus, the system establishes a continuous flow from product management, product presentation, customer transactions, transaction administration, and sales reporting.

For PT. Taria_2ndshoes, this functionality provides a centralized mechanism for reviewing recorded sales activity. Instead of reconstructing sales information from separate communication channels or manually maintained records, administrators can retrieve transaction information through the reporting interface and examine it according to a selected period.

The sales reporting module therefore complements the transaction management function by converting individual transaction records into period-based management information. Although the present study focuses on functional implementation rather than predictive or analytical sales modelling, the reporting function provides a structured foundation for subsequent administrative evaluation and business monitoring.

3.6 Black-Box Testing Results

Black-box testing was conducted to verify whether the implemented functions produced the expected observable responses for both normal and erroneous input conditions. The evaluation covered the principal customer and administrator functions implemented in the system. A total of 25 test scenarios were executed, consisting of 15 valid-input scenarios and 10 invalid-input scenarios. The invalid-input scenarios included incomplete, duplicate, unavailable, or unsupported inputs, for which rejection by the system was considered the expected and correct response. Therefore, a rejected invalid input was classified as a passed test when the system responded according to the predefined validation requirement.

The results of the black-box testing are summarized in Table 1.

Table 1. Black-Box Functional Testing Results

Test Group	Number of Scenarios	Expected Response	Result
Valid-input scenarios	15	The requested function is processed and the expected output is displayed.	Passed
Invalid-input scenarios	10	The system rejects invalid or incomplete data and displays the appropriate response.	Passed
Total	25	Observed behaviour matches each predefined scenario.	25/25 matched

The results indicate that all 25 predefined test scenarios produced the expected system responses. For the valid-input scenarios, the requested functions were successfully executed and the corresponding outputs were displayed. For the invalid-input scenarios, the system correctly rejected inputs that did not satisfy the predefined conditions. Consequently, both test groups achieved a 100% pass rate, resulting in an overall functional test pass rate of 100%.

The tested functions covered the principal customer and administrator workflows, including home-page access, product catalog access, product search, user login, registration, dashboard access, category management, product management, shopping cart operations, checkout, payment-proof submission, transaction management, user management, sales reporting, and logout. The coverage of these functions indicates that the test was not limited to a single module but examined the main observable interactions across the implemented sales workflow.

3.7 Discussion

The implemented interfaces demonstrate that the Prototype development process resulted in an integrated workflow connecting customer-oriented and administrator-oriented activities. On the customer side, the system provides a sequence beginning with the home page and product catalog, followed by account access, product selection, shopping cart, checkout, and payment-proof submission. On the administrator side, the system provides dedicated modules for category management, product management, transaction monitoring, user management, and sales reporting. This separation establishes distinct operational responsibilities while maintaining information connectivity between customer activities and administrative processes. The result is consistent with the purpose of Prototype-based development reported in previous e-commerce research, in which iterative interface development is used to translate operational requirements into an implemented information system [3].

A significant characteristic of the proposed system is its adaptation to the information requirements of second-hand footwear. Unlike a conventional product catalog in which multiple units of the same product can generally be treated as interchangeable stock, second-hand footwear may have differences in physical condition, availability, appearance, and level of use. The implemented product-management and catalog modules consequently provide an information structure through which product identity, brand, category, price, stock, status, and visual information can be maintained and presented to customers. The administrator product module functions as the control point for these records, while the customer catalog provides access to the corresponding product information. This relationship is important because the value of the online catalog depends not only on product visibility but also on the consistency between the information maintained by the administrator and the information accessed by customers.

The integration between product management and the customer catalog also addresses a limitation of the previous operational workflow at PT. Taria_2ndshoes. Before system implementation, product promotion and customer communication were concentrated on social media and private messages, resulting in product, stock, payment, order-status, and reporting information being distributed across separate communication processes. The proposed system moves these activities into a centralized web-based environment. Therefore, its contribution is not simply the conversion of an offline sales process into an online catalog, but the establishment of a connected information flow from product publication to transaction administration and reporting. This positioning differentiates the system from a website used only as a promotional medium.

The transaction management module further strengthens this integration by providing traceability for customer orders. Transaction codes, customer information, transaction dates, payment methods, totals, and transaction statuses can be accessed through a centralized administrative interface. The search and status-filtering functions also allow administrators to locate and monitor specific transactions without reconstructing order information from individual communication histories. This creates a clearer relationship between the customer's purchasing activity and the administrator's operational records. In this respect, the system supports the transition from fragmented transaction communication toward structured transaction management.

The reporting module extends this traceability by transforming recorded transaction data into period-based sales information. The interface summarizes revenue, transaction count, product count, and customer count and provides detailed transaction records together with date-range filtering. Consequently, information generated during individual customer transactions can subsequently be used for administrative reporting. The relationship among these modules forms an end-to-end information chain: product management → product catalog → customer transaction → transaction management → sales reporting. This integrated chain represents an important functional contribution of the proposed system because information generated at one stage can be used by subsequent stages rather than remaining isolated in separate communication channels.

The findings can also be positioned against previous shoe-related and e-commerce studies cited in this research. Zachy et al. [1] investigated a website-based sales information system for shoe MSMEs, demonstrating the relevance of web technology for supporting shoe-product sales. Wardhani and Nevandri [2] applied the Prototype method to a shoe-related website application, while Hapsah and Hanif [3] applied Prototype development to a website-based e-commerce system. These studies establish the feasibility of web-based and Prototype-oriented approaches in related business contexts. The present research extends this context by focusing specifically on the information-management requirements of original second-hand footwear and by integrating product information, product availability, customer transactions, payment-proof handling, transaction monitoring, and sales reporting within one operational workflow. Thus, the contribution of the present study is primarily contextual and functional, rather than the introduction of a new software-development method.

The black-box testing results provide functional evidence for the implemented workflow. Twenty-five predefined scenarios were tested, consisting of 15 valid-input scenarios and 10 invalid-input scenarios. All 25 scenarios produced the expected responses, resulting in a functional test pass rate of 100%. Importantly, the 100% result indicates that the tested functions complied with their predefined input-output conditions; it should not be interpreted as evidence that the system is universally error-free or fully validated in other quality dimensions. The invalid-input tests are particularly relevant because successful rejection of invalid, incomplete, duplicate, unavailable, or unsupported input represents the expected validation behavior rather than a system failure.

The functional testing also covered a relatively broad set of implemented functions, including home-page access, catalog access, product search, authentication, registration, dashboard access, category management, product management, shopping cart, checkout, payment-proof submission, transaction management, user management, reporting, and logout. This coverage provides evidence that the principal observable workflows documented

in the system were examined rather than testing only an isolated module. However, functional conformity under predefined scenarios does not establish performance under concurrent users, resistance to security threats, scalability, or quantitative user experience. These dimensions were outside the scope of the present evaluation and should therefore be considered areas for subsequent investigation.

From an information-system perspective, the findings indicate that the proposed application addresses the primary operational fragmentation identified at PT. Taria_2ndshoes by bringing product, customer, transaction, and reporting information into a single web-based workflow. The system consequently provides two related benefits: customer-side information accessibility and administrator-side information control. Customers can discover products and proceed through the purchasing process within the application, while administrators can maintain product records, monitor transactions, and generate sales reports from centralized modules. The integration of these two perspectives is particularly relevant to second-hand footwear because product availability and item-specific information must remain synchronized with the transaction process.

Nevertheless, several limitations should be acknowledged. The present study evaluates the implemented system primarily from a functional perspective through black-box testing. It does not quantitatively evaluate usability, response time, server performance, concurrent access, security vulnerabilities, customer satisfaction, conversion rate, or operational efficiency before and after implementation. In addition, the study does not employ predictive analytics, recommendation algorithms, automated product-condition assessment, or computer-vision-based footwear inspection. Therefore, the contribution should be understood as an integrated web-based information-system implementation for second-hand footwear sales, rather than as an intelligent or automated footwear assessment system.

Overall, the findings support the suitability of the proposed system for organizing the principal sales workflow of PT. Taria_2ndshoes. The main contribution lies in connecting item-level footwear information, customer product discovery, purchasing activities, transaction administration, and period-based reporting within one application. This integrated workflow provides a more structured digital environment for second-hand footwear sales than a promotional process based primarily on social media and private messaging. The study therefore demonstrates how a Prototype-based information-system development process can be applied to a specific second-hand footwear business context while maintaining functional traceability across the major stages of the sales process.

4 CONCLUSION

This study designed and implemented a web-based sales information system for PT. Taria_2ndshoes using the Prototype development method. The system was developed to address the fragmentation of product promotion, customer communication, transaction recording, and sales reporting that previously relied on separate social media and private-message channels. The resulting application integrates customer-oriented and administrator-oriented activities within a single operational workflow.

The implemented system provides product discovery through a searchable and categorized catalog, customer registration and authentication, shopping cart and checkout functions, payment-proof submission, and transaction access. On the administrative side, the system provides category management, product management, user management, transaction monitoring, and period-based sales reporting. The integration of these functions establishes a continuous information flow from product management and product presentation to customer purchasing, transaction administration, and sales reporting.

A particular contribution of the study is the contextualization of this integrated workflow for original second-hand footwear sales, where product availability and physical characteristics may differ between individual items. The system therefore provides a structured environment for maintaining item-level product information, including product identity, brand, category, price, stock, status, and visual information, while connecting these records to subsequent customer and transaction activities. The contribution is consequently functional and contextual rather than the introduction of a new software-development algorithm or testing technique.

Black-box functional testing was conducted using 25 predefined scenarios, consisting of 15 valid-input scenarios and 10 invalid-input scenarios. All 25 scenarios produced the expected responses, resulting in a 100% functional test pass rate. The result demonstrates compliance of the tested functions with their predefined input-output conditions. However, this result does not represent overall system quality or guarantee performance, security, usability, scalability, or reliability under conditions that were not included in the functional testing.

Overall, the study demonstrates that the proposed web-based information system can provide an integrated digital workflow for managing second-hand footwear sales at PT. Taria_2ndshoes. Future research and system

development can extend the present implementation through quantitative usability evaluation, performance and concurrent-access testing, security assessment, integrated payment and shipping services, and additional product-condition information to further evaluate the system beyond its current functional scope.

DECLARATIONS

Author Contributions:

Dinda Puspa Sari: Conceptualization, Data curation, Formal analysis, Software, Writing–original draft.

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