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Web-Based Rapid Application Development (RAD) for Marketing of Ende Lio Traditional Bond Motif Woven Fabric

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Abstract

The marketing of Ende Lio traditional bond motif ikat woven fabric predominantly relies on conventional market stalls. However, with the growing demand for diverse products derived from ikat weaving, such as garments, bags, tunics, and accessories, there is a need for a more efficient marketing strategy. This study aims to implement Rapid Application Development (RAD) and design a web-based marketing system for the Marketing of Ende Lio Traditional Bond Motif Woven Fabric to enhance accessibility and increase public awareness of the products. The objectives of this research include developing an intuitive and interactive web-based platform for marketing Ende Lio's woven ikat fabrics, improving the efficiency of the marketing process, ensuring a seamless user experience, and evaluating the system's impact on sales and customer satisfaction. The RAD methodology, renowned for its incremental and time-constrained software development approach, was employed. The design process involved the use of Use Case Diagrams, and unit testing was conducted to validate the functionality and performance of the application.

Keywords: Rapid Application Development; Web-Based Marketing; Ende Lio Traditional Bond Motif; Unit Testing.

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Introduction

The survey conducted by the Central Statistics Agency (BPS) from July 10th to 26th, 2020, with 34,559 business respondents, revealed that approximately 5.76 per cent of new companies used the internet and information technology (IT) for marketing during the pandemic. It was explained that overall, around 47.75 per cent of companies had been using the internet and IT for online marketing even before the pandemic. Additionally, during the pandemic, around 5.76 percent of new companies adopted the Internet and IT for marketing purposes. Out of every five businesses utilizing online marketing, four acknowledged that this approach had a significant impact on their product sales. The survey indicated that the majority (62.64 per cent) of companies engaged in online marketing belonged to the same industry or sector according to their business profiles. Furthermore, approximately 27.45 percent of companies that newly started using the internet and IT for marketing during the pandemic engaged in business diversification (Badan Pusat Statistik, 2020).

The marketing of Ende's traditional ikat weaving is still primarily conducted through conventional means, such as selling at local market stalls (Billore & Hägerdal, 2019). However, as time goes on, there is an increasing trend of customers ordering various variants of woven fabrics (Jalil & Shaharuddin, 2019; Paço, Leal Filho, Ávila, & Dennis, 2021). For instance, ikat weaving can be transformed into jackets, clothing, bags, tunics, and accessories directly made from the fabric itself. Nevertheless, researchers have identified some challenges, such as limited promotional media and the practice of ordering woven products through bazaars (Setiawati, 2021). Despite the availability of various online platforms, customers are still reluctant to make purchases due to the relatively high costs (Li, Xu, Bai, Guan, & Zeng, 2021). Additionally, customers in the area lack awareness of the range of products available, which requires them to visit the store to see the available options.

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The research utilizes the Rapid Application Development (RAD) approach, which is a development cycle designed to provide faster development and higher-quality results compared to traditional cycles. As described by (Capucao, Palaoag, & Sierra, 2020), RAD offers a more efficient development process. Based on the identified issues, the researchers are interested in building an information system aimed at marketing and promoting new products at the store. The system will be web-based, allowing people to access it anytime as long as they have an internet connection.

Method

The system design method used in this study is Rapid Application Development (RAD), which is a sequential linear system development method that emphasizes a system development cycle with a relatively short time frame, resulting in time savings and faster system development processes (Awaliah, Justika, Laswi, & others, 2022); (Iskandar, 2022). The use of the Rapid Application Development (RAD) method in software design enables more efficient system development and maintenance. In a typical application development scenario, it takes a minimum of 180 days, but with the Rapid Application Development (RAD) method, the application can be completed within 30-90 days (Wahyuningrum, Fitriana, Wardhana, Sidiq, & Wahyuningsih, 2021). The stages involved in creating an information system using the Rapid Application Development (RAD) method are Requirement Planning, RAD Design Workshop, and Implementation.

Requirement Planning Phase

In this phase, all the information requirements needed by the users are identified. The users are divided into two categories: administrators and regular users, each with different access rights. This phase typically takes several days, depending on the size of the system or application being developed.

Table 1. Functional Requirements.

Actor	Functionality
Marketplace Admin	Admin data input
	Registration confirmation
	Category input
	Profile editing
	News posting
Seller	Seller registration
	Category input
	Profile editing
	Product input
Customer	View products
	View sellers
	View news
	Place orders via WhatsApp

Table 1 presents the functional requirements of the system for the different actors involved. The "Marketplace Admin" is responsible for various functionalities, including inputting administrative data, confirming user registrations, inputting and managing product categories, editing their profile, and posting news or updates. The “Seller” has functionalities such as registering themselves within the marketplace, inputting and managing product categories, editing their profile, and inputting and managing their products. Lastly, the “Customer” can view products available in the marketplace, view information about sellers, read news or updates, and place orders for products through WhatsApp. These functional requirements outline the specific actions and capabilities assigned to each actor, ensuring smooth operation and interaction within the system.

Non-functional Requirements

The non-functional requirements for the system include information requirements, operational requirements, software requirements, security requirements, and performance requirements. The information requirement focuses on the outcome of the research, which is a sales system that facilitates product promotion and ordering. Operational requirements involve the necessary hardware specifications, such as an Intel Celeron processor, LDK.AI keyboard and mouse, 4GB RAM, and 1TB HDD. The software requirements encompass the Windows 10 operating system, Sublime

Text 3 for coding the website application, XAMPP as the local server, MySQL for database creation, and browsers like Google Chrome or Mozilla Firefox. The system ensures security through user accounts with usernames and passwords for data protection. Performance requirements aim to provide convenience for customers by enabling them to view products without visiting the store, allowing them to place orders from home, and enabling the store owner to generate sales reports. These non-functional requirements cover various aspects to ensure the system's effectiveness, efficiency, security, and performance.

RAD Design Workshop Phase

The RAD Design Workshop phase consists of conceptual schema design for the system being developed, as well as user interface design. During this phase, workshops are conducted, divided into two components: working with users to design the system and collaborating with analysts to determine an information system design that aligns with user requirements. Both users and analysts work together throughout the system development process. Additionally, in this phase, users provide feedback on the jointly designed prototype. Once the information system is designed and meets user expectations, the next step is to build the required system. Use case diagrams are employed in the system design process, providing explanations of actors and their respective functions within the system.

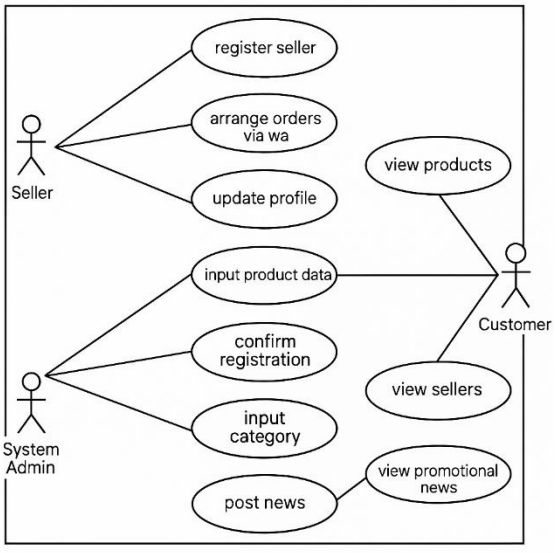

Figure 1. System Use Case Diagram

In Figure 1, three actors are depicted in the system: the admin actor, the seller actor, and the customer actor. The admin actor has functionalities such as confirming customer data, inputting categories, and updating profiles. The seller actor can register as a seller, add products, and conduct transactions via WhatsApp if necessary. Lastly, the customer actor can access the system, view products, place orders via WhatsApp, and confirm orders.

Results and Discussion

Result

During the development process of the web-based Rapid Application Development (RAD) system for marketing Ende Lio traditional bond motif woven fabric, this research emphasizes the collaborative efforts between the analyst and the users in system development. This section presents an overview of the implementation process and highlights the achieved outcomes of the system.

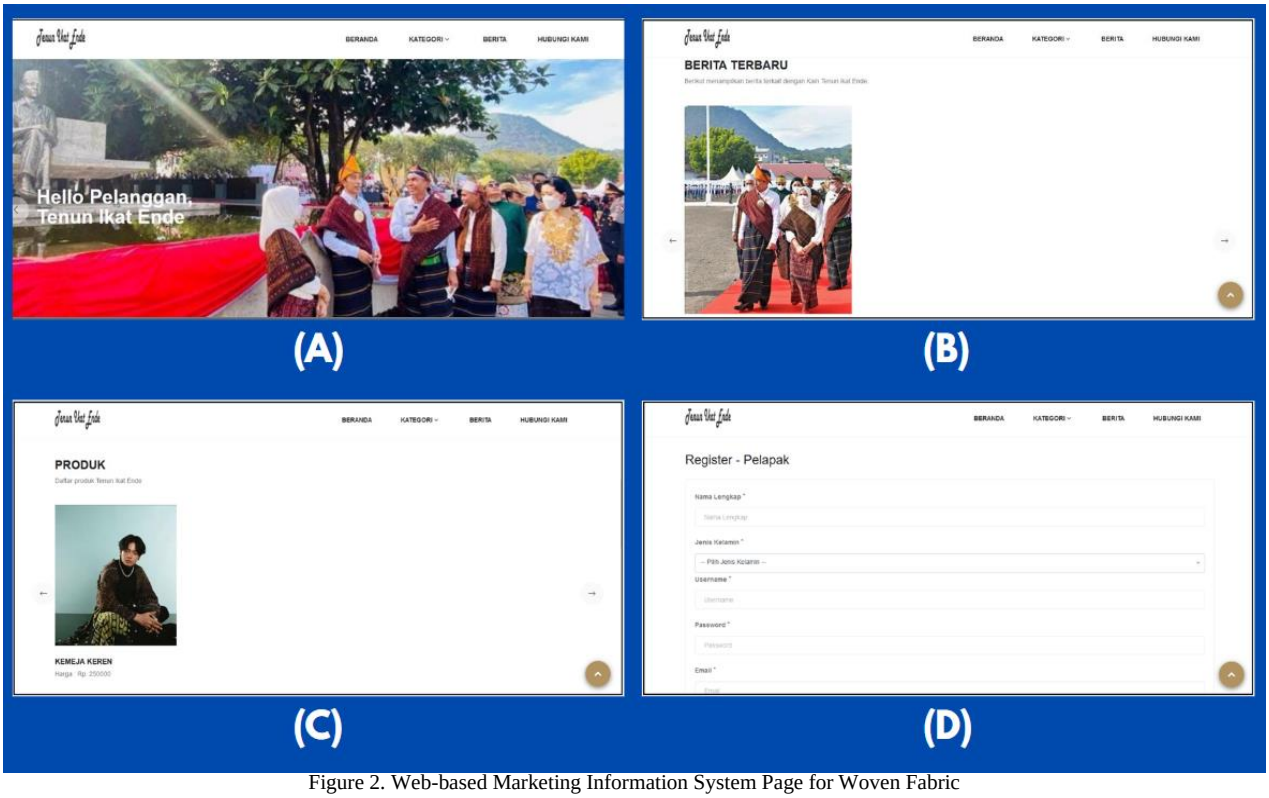

Figure 2. Web-based Marketing Information System Page for Woven Fabric

Figure 2 provides an overview of the marketing information system, which consists of several menus containing various information related to Ende Lio ikat woven fabric. In Figure 2a, visitors/customers can access the system's homepage, where they can view a range of marketed products. Upon initial access, customers are directed to the homepage. Figure 2c showcases the News Page, which displays the latest news about Ende Lio ikat woven fabric products, including news about the visit of the President, who wore one of the products. Figure 2d presents the Product Page, which showcases all the products posted by sellers across different categories. Lastly, Figure 2e displays the Seller Registration Page, where prospective sellers can register to market their products within the system.

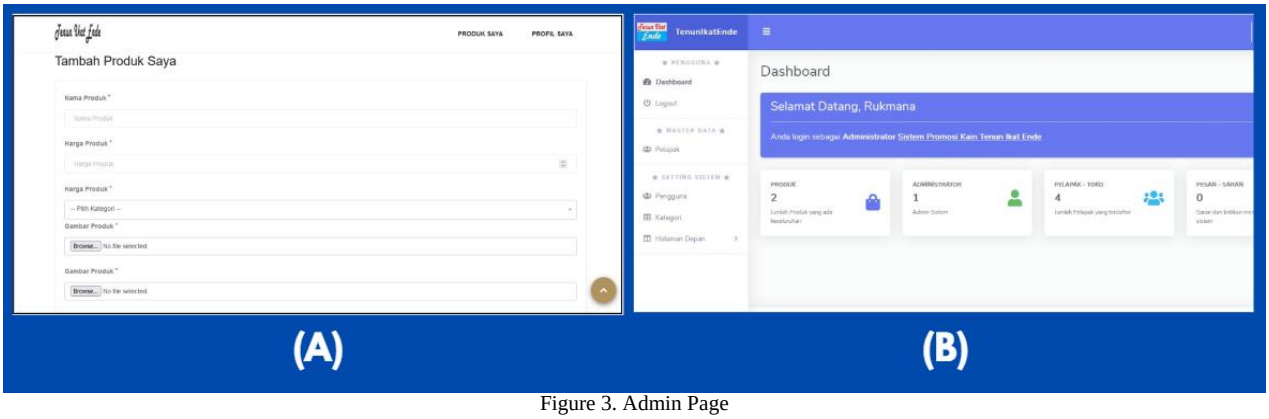

Figure 3. Admin Page

Figure 3 provides an overview of the Admin Dashboard page, featuring several menus. In Figure 3a, the Input Product Page is displayed, allowing sellers to add products for promotion or marketing purposes. Figure 3b showcases the

Admin Dashboard Page, where administrators can access information and manage data related to Products, Users such as Sellers, as well as view messages and suggestions.

Table 2. Unit Testing.

Component	Expected Result	Actual Result	Status
Login Module	Successful login	Successful login	Pass
	Invalid credentials	Invalid credentials	Pass
Product Module	Add product	Add product	Pass
	Update product	Update product	Pass
Order Module	Place order	Place order	Pass
	Cancel order	Cancel order	Pass
Search Module	Search by keyword	Search by keyword	Pass
	Filter by category	Filter by category	Pass

Table 2 presents the results of the unit testing phase conducted on the web-based Rapid Application Development (RAD) system for marketing Ende Lio traditional ikat woven fabrics. Testing focused on various components, including the Login Module, Product Module, Order Module, and Search Module, each of which had specific test cases. The unit testing results confirmed the correct functionality of all tested components, This successful unit testing indicates the readiness of the system for the implementation stage.

Discussion

The findings of this study are consistent with previous research showing the effectiveness and benefits of a web-based Rapid Application Development (RAD) system for marketing traditional woven fabrics. (Capucao et al., 2020) conducted research demonstrating that applying RAD methodology to web-based systems enables quicker development cycles and efficient delivery of functional, high-quality applications. Similarly, (Leonardo & Wiratama, 2023; Zaragosa, 2022) conducted studies showcasing the reliable functionality and alignment with user requirements of the RAD-based system for marketing Ende Lio traditional ikat woven fabrics. Therefore, it can be concluded that the implemented web-based RAD system enhances accessibility for customers, facilitating easier access to traditional craft products.

Conclusions and Suggestions

Conclusions

In conclusion, this research focuses on the implementation of a web-based Rapid Application Development (RAD) system for marketing Ende Lio traditional ikat woven fabrics. The research successfully developed and tested the system, demonstrating its reliability and functionality. The system serves as an efficient platform for showcasing products, facilitating customer orders, and enhancing the overall user experience. The unit testing phase confirmed the correct functioning of the various system components, ensuring the accuracy and reliability of each unit. The implementation of the web-based RAD system holds significant practical implications for the marketing of traditional craft products. The system enables artisans and sellers to reach a wider audience, expand their market presence, and seize new sales opportunities. Customers can conveniently access and purchase traditional woven fabric products through the system.

Suggestions

Based on the findings and results from this study, the following recommendations are suggested for further research:

1. Conduct a comparative analysis between the web-based RAD system and traditional marketing methods to assess their effectiveness, efficiency, and impact on sales and market reach.
2. Conduct a comprehensive evaluation of the user experience to gather feedback on usability, interface design, and overall satisfaction with the web-based RAD system.
3. Conduct a long-term impact assessment to examine the sustainability and longevity of the web-based RAD system in promoting Ende Lio's traditional ikat woven fabrics.

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