

Development of an E-Commerce Website for Marketing Handicrafts and Carvings Unique to Sikka Using the Agile Software Development Method as an Effort to Enhance the Local Creative Economy

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Article Information	ABSTRACT
Article History Received : December 08, 2025 Revised : December 19, 2025 Published : January 10, 2026	The need for digital marketing for local artisans in Sikka Regency is increasing, requiring the development of an e-commerce system to expand market reach and support online product promotion. This study aims to design and build an e-commerce website as a digital marketing medium for artisans. The system development was carried out using the Agile Software Development method, with implementation using the CodeIgniter framework, PHP programming language, MySQL database, and interface design based on HTML, CSS, and Bootstrap. Functional testing was carried out using blackbox testing, while usability evaluation was conducted through user experience (UX) testing. The results of the study show that all the main features work according to user needs and are considered easy to use, with a clear display and fast system response. The system was successfully deployed and used by artisans as a digital marketing medium. Maintenance is carried out iteratively to support the sustainability of the system's use. Overall, the user satisfaction test results showed a positive satisfaction level of 98% for the developed system.
Keywords: <i>e-commerce;</i> <i>Agile methodology;</i> <i>digital marketing;</i> <i>blackbox testing;</i> <i>user satisfaction.</i>	

INTRODUCTION

Sikka Regency, located in East Nusa Tenggara Province, has great creative economic potential, especially in handicrafts and traditional carvings that have been passed down from generation to generation. These products are not only economically valuable, but also rich in cultural value that can attract tourists and strengthen local identity (Dewi et al., 2025). However, to date, the marketing of these products is still largely done conventionally through traditional markets and local shops, resulting in limited consumer reach (Husna et al., 2022). Population data for Sikka Regency in 2024 shows that there are 340,920 people, with 62.81% of them being of productive age (15–59 years), which actually represents a huge potential for the development of technology-based creative economy (Safitri et al., 2024).

On a national scale, the development of e-commerce provides significant opportunities for MSMEs to expand their markets. The value of e-commerce transactions in Indonesia in 2023 reached IDR 453.75 trillion, a sharp increase compared to the previous year (Ramli & Djumena, 2024). Reports from the Ministry of Cooperatives and SMEs and a survey by the Indonesian Internet Service Providers Association (APJII) cited by the media show that 87% of MSMEs in Indonesia have utilized marketplaces as a channel for selling or promoting their products (Basuki,

2023). The most widely used marketplaces are Tokopedia (73.7%), followed by Lazada (38.81%), Shopee (34.33%), and Blibli (12.54%) (Septiani, 2023).

However, the level of e-commerce utilization in eastern Indonesia, including East Nusa Tenggara, is still relatively low. This is related to low digital literacy, limited infrastructure, and a lack of technology training for artisans (Bahtiar et al., 2025 ; Avista et al., 2025 ; Utomo & Setiyono, 2024). Digital literacy studies show that most MSMEs in the region only use the internet for basic communication through social media, not yet for more complex marketing and business transactions (Lukas & Hasudungan, 2019 ; Yuniati & Supriadin, 2024). This condition has resulted in artisans in Sikka Regency not being able to take advantage of digital opportunities as MSMEs in other regions have.

In the context of technology development, a flexible, iterative, and adaptive approach to user needs is required. Agile Development has proven to be effective in web-based application development because it involves users directly in the development process, resulting in products that are more suited to their needs *kebutuhan* (Mishra & Ibrahim, 2023 ; Nova et al., 2022). Several studies in Indonesia confirm that this approach is suitable for MSME-based systems because it emphasizes simplicity, functionality, and adaptability *adaptasi* (Saputra et al., 2024 ; Setiawan et al., 2024 ; Prahastyo et al., 2023).

Based on this background, it can be concluded that artisans in Sikka Regency face three main problems: (1) limited market access due to conventional marketing, (2) low digital literacy, and (3) the absence of a dedicated platform designed to facilitate *thse* marketing of local handicraft products. The main objective of this study is to develop an e-commerce website as a digital marketing tool for handicrafts and carvings typical of Sikka Regency, in order to expand market access, increase the competitiveness of local products, and support the growth of a creative economy based on regional culture.

RESEARCH METHODS

This study uses a research and development (R&D) approach with the aim of producing an e-commerce website that can be used by craftsmen who produce handicrafts and carvings typical of Sikka Regency. The study was designed to involve craftsmen as partners so that the system developed would meet their real needs. The research population consisted of all artisans in Sikka Regency, while the research sample consisted of 15 artisans selected using purposive sampling, based on the criteria of production activity, product variety, and involvement in marketing (Alimusa et al., 2022 ; Charisma et al., 2025).

The research stages followed the Agile Software Development model, as illustrated in Figure 1. This model was chosen because it emphasizes flexibility, iterative processes, and user involvement at every stage, so that the resulting system is more relevant to field needs (Herawati & Putri, 2025 ; Samosir & Nengsih, 2024).

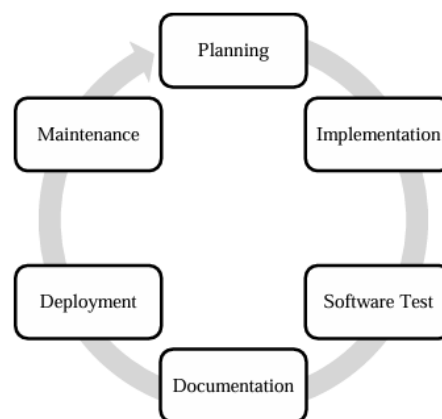


Figure 1. Agile Software Development Cycle

In the Agile model, the research and development stages include:

1. *Planning*: identifying artisan marketing issues through observation and interviews, and formulating system requirements.
2. *Implementation*: building an e-commerce website based on the design, using the CodeIgniter framework and MySQL database.
3. *Software Testing*: conducting functional testing with blackbox testing to ensure all features are working, as well as user experience testing to assess ease of use.
4. *Documentation*: compiling documentation of the system development results and technical notes that can be used for evaluation.
5. *Deployment*: launching the website so that it can be used by artisans and consumers as a digital marketing medium.
6. *Maintenance*: performing bug fixes, feature enhancements, and providing assistance to artisans to ensure the website's sustainability (Akwilla & Jollyta, 2024 ; Aryansyah et al., 2024).

The research data was analyzed using descriptive qualitative and quantitative approaches. Qualitative analysis was used to explore the needs and constraints of artisans, while quantitative analysis was applied to numerical data, such as the number of artisans who market their products conventionally and the percentage of digital device usage. This approach enabled the research results to not only describe the conditions in the field, but also to present real solutions in the form of a ready-to-use e-commerce system.

RESULTS AND DISCUSSION

Research Result

This research successfully produced a functional e-commerce website that can be used to market handicraft products from Sikka Regency. The website was built using the CodeIgniter framework, MySQL database, and an interface based on HTML, CSS, and Bootstrap. Key features include an admin dashboard, shopping store dashboard, store report dashboard, store wishlist dashboard, store purchase history dashboard, store product dashboard, notifications, search filters, search system, advertising, order tracking, and feedback for data management.

Discussion

Planning

During the planning stage, researchers conducted observations and in-depth interviews with artisans as research samples. The results of the needs assessment showed that artisans still face limited market access due to conventional marketing, the lack of proper product documentation, and low digital literacy in managing technology-based marketing. These conditions emphasized the need for an e-commerce platform that could help artisans reach a wider range of consumers and promote their products digitally.

Based on these findings, functional requirements were identified, such as a product catalog, store management, a search system, a shopping cart, and order management. Non-functional requirements included ease of use, data security, and a responsive display. To clarify the relationship between actors and system functionality, a Use Case Diagram was also developed at this stage, illustrating the flow of interactions between crafter, admin, and buyers regarding key features. This visualization is attached as a reference for the subsequent system design process.



Figure 2. Use Case Diagram

This Use Case Diagram illustrates the interactions between three actors, namely Admin, Craftsman, and Buyer, with the handicraft e-commerce system. Admin has access rights to manage users, products, orders, reports, and profile settings. Craftsman play a role in managing product stock, processing incoming orders, and updating profile information. Meanwhile, buyers can register accounts, view and search for products, add products to their cart, checkout and make payments, view order status, and leave reviews. Almost all activities on the system are connected to the Login process, which is a prerequisite before users can access features according to their roles.

Implementation

At this stage, the system development process began to be implemented using the CodeIgniter framework with the PHP programming language, utilizing MySQL as the database. The user interface was designed using HTML, CSS, and Bootstrap to produce a responsive, simple, and easy-to-use display for both craftsmen and consumers.

The implementation includes the development of several key modules, namely:

1. **Admin Dashboard**, which functions to manage user data, categories, products, and reports.

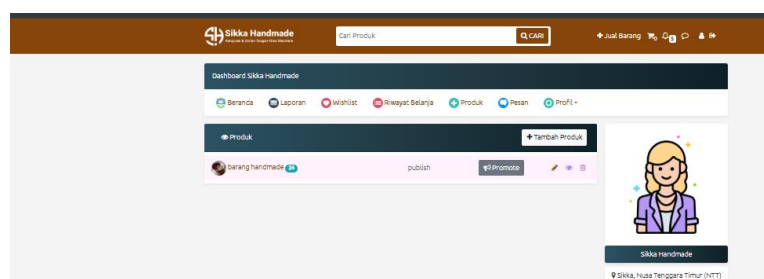


Figure 3. Manage Products page

Figure 3 shows the product management page used by administrators to manage product data on the e-commerce website for handicrafts and carvings typical of Sikka. Through this

page, administrators can add, change, delete, and set the publication status of products so that the data displayed is always up to date and ready to be marketed online.

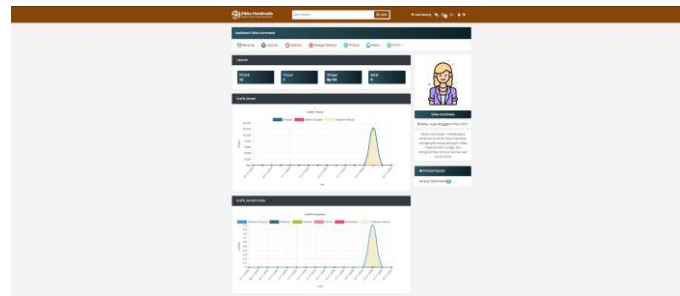


Figure 4. Report Page

Figure 4 shows the report page used by administrators to monitor e-commerce system activities, such as transaction and sales data, for evaluation purposes.

2. **Craftsman Store Dashboard**, used to upload products, manage orders, and monitor sales history.

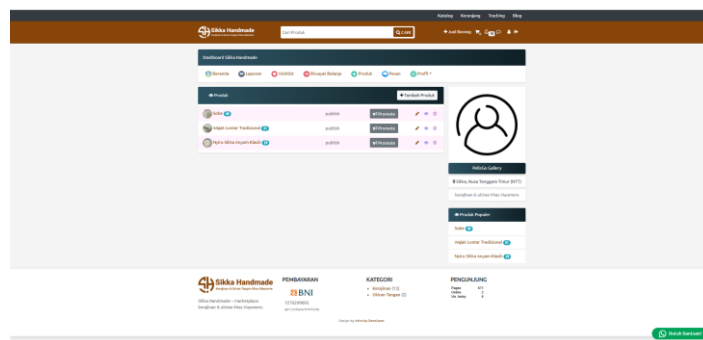


Figure 5. Product Upload Page

Figure 5 shows the product upload page used by artisans to add new products before they are published on the website.

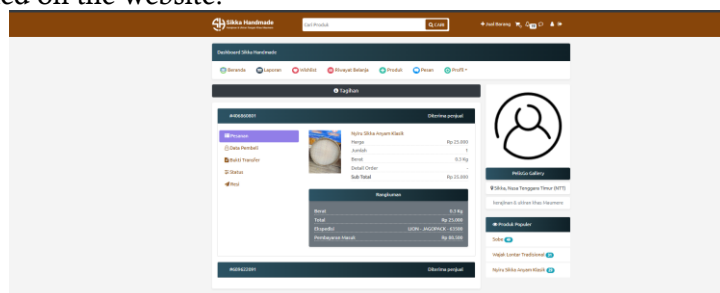


Figure 6. Order Management Page

Figure 6 shows the order management page used by artisans to monitor and process incoming orders, including viewing order details and transaction status.

3. **The Buyer Store Page**, which provides product search features, category filters, wish lists, and checkout processes.

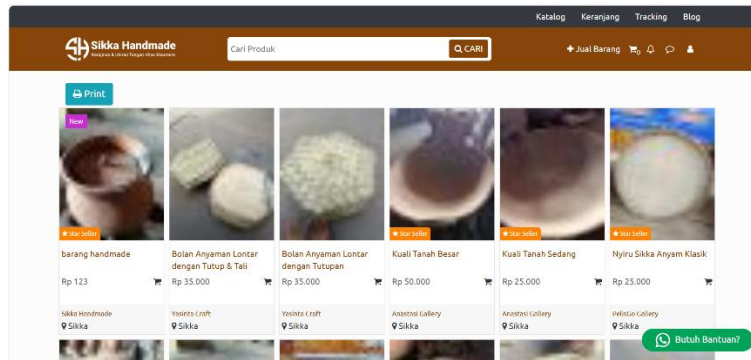


Figure 7. Catalog Page

Figure 7 shows the catalog page that buyers can access to view and select available handicrafts and carvings typical of Sikka.

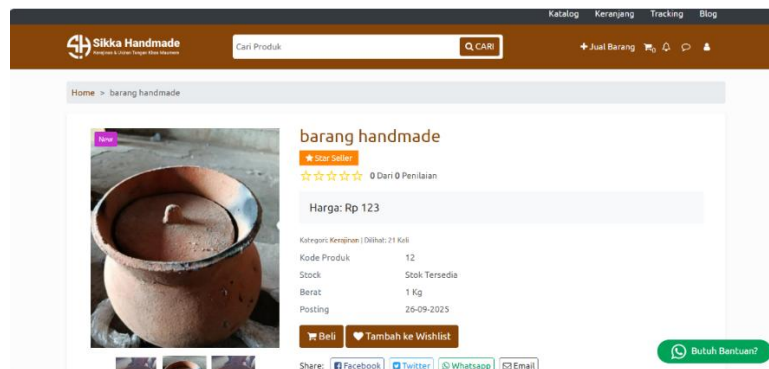


Figure 8. Wishlist Page

Figure 8 shows the wishlist page used by buyers to save a list of products they are interested in before making a purchase.

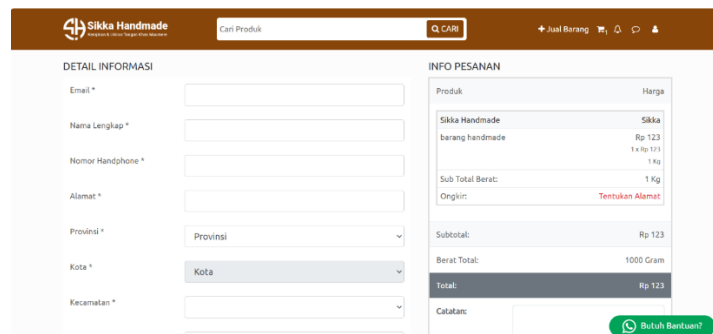


Figure 9. Checkout Process Page

Figure 9 illustrates the checkout process page used by buyers to complete transactions, from order confirmation to payment methods.

4. Notification System, as a reminder of system activity and order status.

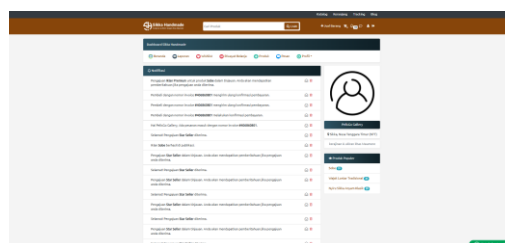


Figure 10. Notification System Page

Figure 10 shows the notification system page used by users to receive information related to order status and transaction activities.

5. **“Advertising Promotion” feature**, designed to facilitate artisans in promoting their products.

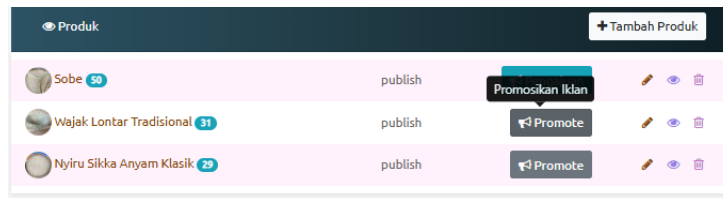


Figure 11. Advertising Promotion Page

Figure 11 shows the advertising promotion page used by administrators to manage and display product advertisements to support marketing activities.

6. **Order Tracking and Feedback feature**, to monitor delivery status and provide feedback from consumers.

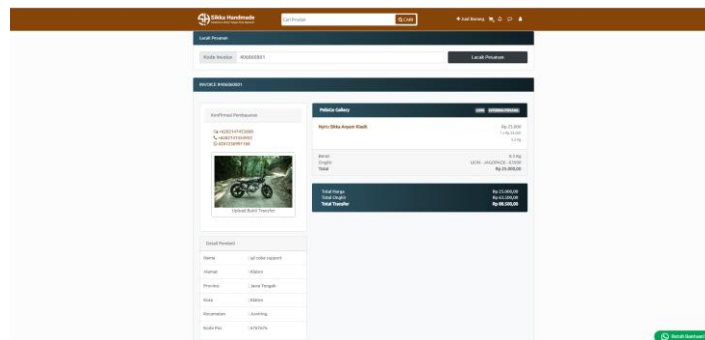


Figure 12. Track Order

Figure 12 shows the order tracking page used by buyers to monitor the status and progress of orders after transactions have been made.

Software Testing

During the system testing phase, two main types of tests were conducted to ensure software quality, namely blackbox testing and user experience (UX) testing. Blackbox testing was used to evaluate system functions based on input and output without looking at the structure or logic of the program itself. User experience testing was then applied to assess the ease of use of the system from the perspective of end users, particularly craftsmen and buyers. Testing is conducted through the distribution of questionnaires that assess aspects such as ease of navigation, clarity of display, speed of access, and overall user satisfaction. The detailed test results are presented in the following table.

Table 1. Blackbox Testing

No.	Feature Tested	Test Scenario	Expected Result	Test Result	Status
1	Admin Login	Enter valid username & password	Successfully logged into dashboard	Success	Valid
2	Upload Artisan Products	Enter complete data & upload photos	Products saved & displayed in store	Success	Valid
3	Buyer Checkout	Click checkout & fill in order details	Order saved & notification appears	Success	Valid
4	Manage Craftsmen Orders	Confirm orders	Order status changed	Success	Valid

5	Notification System	There is a new transaction	Notification appears on the dashboard	Success	Valid
6	“Easy Ad Placement” feature	Fill out the ad form	Ad appears on the homepage	Success	Valid

Table 1 shows the results of black box testing on the main features of the e-commerce system, including admin login, artisan product uploads, buyer checkout, order management, notification system, and the “Easy Advertising” feature. The test results show that all features are valid and function according to system requirements.

Table 2. User Experience Testing

Statement	Ordinal Scale Respondents			
	Strongly Agree	Agree	Disagree	Strongly Disagree
The system interface is easy to understand and not confusing	8	21	1	0
Easy-to-find menus and features (clear navigation)	11	18	1	0
The system responds quickly when in use	5	25	0	0
The information displayed on the system is clear and easy to understand.	7	23	0	0
For Artisans: The product upload and order management processes are easy to do.	2	12	1	0
For Artisans: The “Easy Advertising” feature helps promote products	2	12	1	0
For Buyers: Product search, category filters, and wishlists are easy to use	5	10	0	0
For Buyers: The checkout process and order tracking are clear and straightforward	3	12	0	0
Total Value	43	133	4	0
Persentase	24%	74%	2%	0%
Total Respondents	thirty people			

Based on the test results table using the blackbox method, all major features of the system have been successfully implemented according to the expected scenarios without any functional errors. In addition, the results of the user experience questionnaire show that respondents gave positive assessments of the developed system. A total of 24% of respondents strongly agreed and 74% agreed with the aspects of ease of use, clarity of display, system response speed, and the benefits of the system in supporting their activities. Meanwhile, only 2% of respondents disagreed and no respondents strongly disagreed. Therefore, it can be concluded that the website not only functions well technically, but also meets the needs and provides a good user experience for both artisans and buyers.

Documentation

During the Documentation phase, all e-commerce website development results are documented to facilitate maintenance and further development. The documentation includes explanations of each module's functions, database structure, system usage flow, and project file backups such as program code and databases. Technical guidelines are also compiled so that artisans and developers can understand the steps for using and maintaining the system. This documentation ensures that every change during the Agile iteration can be traced and supports the continued use of the website by Sikka artisans.

Deployment

The deployment stage is carried out after the system is declared fit for use based on the results of functional testing through blackbox testing and usability evaluation through UX testing. At this stage, the official e-commerce website is published and begins to be used by artisans and consumers as a digital marketing medium for handicraft products.

The deployment process is carried out in stages, starting with server preparation and hosting configuration, followed by uploading system files and setting up database connections so that the system can run online. Once the website is active, artisans are given information and training on how to use the system, such as uploading products, managing orders, viewing sales history, and using the promotional feature through the “Easy Advertising” menu.

During the initial implementation period, the development team monitored the website to ensure it was operating properly and did not experience any technical issues. This monitoring also aimed to gauge users' immediate response to the system so that any problems could be addressed immediately. This deployment phase marked the beginning of the actual use of the system and served as a final evaluation before entering the maintenance phase to ensure the continued use of the system.

Maintenance

The maintenance phase is carried out after the system is officially operational to ensure that the e-commerce website continues to run optimally and can be used sustainably by both artisans and consumers. Maintenance is carried out periodically and incidentally based on any issues found during use.

At this stage, the development team performs the following:

- a. Fixes bugs or errors that arise after the system is actually used.
- b. Optimizing system performance, especially in the process of accessing product pages and transactions.
- c. Monitoring system security, including database backup settings and protection against unauthorized access.
- d. Providing technical assistance to artisans who encounter difficulties when using the system, such as when uploading products or updating store information.

This maintenance is carried out iteratively in accordance with the Agile principle, which is to improve deficiencies and enhance system functionality based on direct feedback from users. With this stage, the system can continue to adapt to user needs and remain relevant as a digital marketing tool for artisans.

CONCLUSION

Based on the results of the research and discussions that have been conducted, it can be concluded that the e-commerce website for marketing handicraft products typical of Sikka Regency has been successfully developed using the Agile Software Development method. The system was built using the CodeIgniter framework with a MySQL database and an interface based on HTML, CSS, and Bootstrap, and has undergone functional testing using blackbox testing and user experience evaluation through UX testing. The test results show that all the main features work according to the needs of craftsmen and consumers, and provide a good user experience in terms of navigation, system speed, and ease of operation. The user satisfaction survey results showed a very positive response, with 24% of respondents strongly agreeing and 74% agreeing with the use of the system, resulting in a positive satisfaction rate of 98%. The system implementation proceeded smoothly through the deployment process and is being used directly by artisans as a digital promotional medium. Maintenance is carried out through regular monitoring, system improvements, and user support to ensure the system can be used sustainably.

As a follow-up to this study, it is recommended that artisans continue to make optimal use of the website by updating their product catalogs and maximizing the available marketing features. Future system development could include the integration of digital payment methods, real-time shipment tracking features, and development of a mobile application platform to improve accessibility. Local governments and related parties are expected to provide support through technology training and digital promotion to expand marketing reach. For further research, an analysis of the impact of system usage on increasing sales or artisan income can be conducted, as well as an evaluation of consumer satisfaction levels so that the system can be continuously improved according to user needs.

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