

E-Commerce Applications in Increasing Consumer Access to Muslim Boutique Products Using the Waterfall Method

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ABSTRACT

Objective: The research aims to develop an e-commerce application that enhances customer access to boutique fashion items through an efficient and user-friendly digital platform. **Method:** The system was designed using the Waterfall development model, supported by analytical tools such as flowcharts, entity relationship diagrams, and data flow diagrams, while MySQL was employed as the database structure. **Results:** The implementation of the web-based e-commerce application enabled customers to easily browse updated product information, select clothing models remotely, and complete transactions seamlessly. User feedback indicated high satisfaction, with 85% of respondents reporting that shopping became more convenient and enjoyable. **Novelty:** This study offers a focused digital solution tailored specifically for Muslim boutique SMEs, demonstrating how structured system design and web-based technologies can strengthen business competitiveness and expand market reach through accessible and culturally attuned e-commerce services.

INTRODUCTION

Our daily lives are inseparable from fashion. In this regard, most of the general public only associates fashion with clothing or second-hand clothing. In reality, the term "fashion" encompasses a wide range of current trends, including hairstyles, accessories, makeup, clothing, and lifestyle. Information is readily and quickly available over time. Furthermore, the impact of foreign cultures and Indonesian multiculturalism also contribute to the various changes that occur periodically, resulting in diverse personal fashion preferences. [1] One business sector currently experiencing intense competition is the boutique industry, which includes the garment industry. In order to gain a competitive advantage and maintain market share, sellers must be able to produce various appropriate tactics. Given the many choices available to them for products based on their needs and preferences, marketers are now more concerned with whether the product has met the customer's needs than how the clothes get to them. Therefore, a sales innovation strategy is needed, which continuously strives to attract new customers by offering better services. [2]

The existence of e-commerce is one of the technological innovations that continues to grow. E-commerce is the act of making purchases and sales using electronic media only by using a smartphone and the internet. Many aspects of life are significantly impacted by this e-commerce system. According to Laudon and Laudon, e-commerce is a process in which people sell and buy goods electronically. E-commerce is a business-

to-business transaction that involves a computer intermediary, especially a computer network. [3] In recent years, information system technology has developed very rapidly. In the business world, this helps various things to continue to progress, especially with web-based tools. Web-based applications are easy to use and have a user experience that can be used on both smartphones and PCs. Information systems are used by business people to monitor their inventory, sales, and transaction records. Because technology changes rapidly, every business must be able to keep up by creating a digital system that can obtain information quickly, correctly, and specifically. [4] Therefore, small business owners in the Muslim boutique industry do not want to miss this growth as a profitable opportunity to make money by selling various fashion models at affordable prices, high quality, and good models. The Jaticalang Village area, located at RT.02 RW.02, Prambon District, Sidoarjo, East Java, is the main location for this Muslim women's boutique business.

RESEARCH METHOD

In conducting this research, the researcher prioritized data that would strengthen the explanatory and analytical components. Therefore, the researcher employed analytical and systems techniques. The following are the techniques and systems analysis employed:

A. Observation

Direct observations were conducted, with researchers working quickly, and they also followed procedures to evaluate the lecturers' understanding of the system at that time. This was necessary so that researchers could examine the system in use. They also gathered information to determine the requirements of the system to be built.

B. Literature Review

The data collection stage in this research involved a literature review, which involved gathering information and data from books, websites, and journals related to the research topic.

From the data collection procedure to the final research findings, the authors of this work took steps to optimize the results. This research was conducted in five stages, as follows:

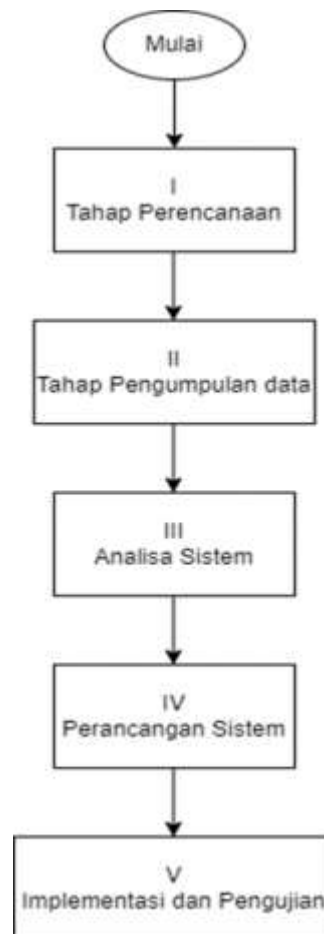


Figure 2. Research Stages

To collect data to aid the research process, researchers undergo several study stages, as depicted in Figure 2.1. These stages include planning, implementation, and testing. These systems analysis stages are designed to avoid duplication of studies, provide a theoretical foundation, demonstrate relationships between current and previous research, and strengthen components of a comprehensive understanding of the research issue.

1. Basic concepts of e-commerce applications

“E-commerce” is a term for businesses that use computers and the internet. The 2018 E-Conomy SEA report and Google research results, which showed that Indonesian e-commerce transactions reached US\$27 billion (Rp391 trillion), demonstrate that e-commerce is growing rapidly in this country. In the past four years, e-commerce has grown by 500%. September Tangkary, Director of Informatics Empowerment at the Directorate General of Informatics Applications at the Ministry of Communication and Informatics, stated that e-commerce in Indonesia grew by 78% in 2018. This is the fastest growth rate in the world. [6].

One way technology is used to make businesses more competitive is through electronic commerce, or e-commerce. E-commerce is used to market various goods and services in both digital and physical forms. E-commerce is the act of buying or selling goods, services, or information between two people in a business environment over the internet. [7].

2. System development model

The waterfall method refers to a methodical, phased, and sequential approach to software development. The specification of user requirements is followed by a planning phase, which includes design, development, delivery of the system to users, and provision of support for the completed program. [8].

3. Boutique Products

Small business owners are more interested in opening boutiques than other types of fashion businesses. As more business owners enter the fashion industry, competition becomes increasingly fierce. Business owners must find ways to maintain their operations due to the intense competition. Many people are very picky about the items they buy, so business owners must be able to create products that meet their needs and desires. [9]. One type of women's clothing widely sold in this store is dresses and robes. This is done to provide customers with a wider choice when shopping for clothes.

4. Website

A website is known as "a collection of web pages published on the internet with a domain/URL (Uniform Resource Locator) that can be accessed by all internet users by entering the address." HyperText Markup Language (HTML) is used to write most website pages, and HTTP can be used to view them. HTTPS is a system that allows website servers to send various types of information to web browsers so users can view them. This is made possible by the World Wide Web (WWW). [10].

The stages of system, database, and interface design are as follows. This stage in the design process involves creating the MySQL database to be used and the system interface to be developed later. [11]

The researchers used the following procedures and elements:

The purpose of a flowchart is to define the process flow from the beginning of a program to its conclusion. Using a flowchart as a communication tool, problems are solved by breaking down information into smaller components. Input-output, operational procedures, connecting lines for process sequences, and descriptive data serve as the basis for creating a flowchart. A flowchart is a graphical representation of program phases and the sequence of operations [12]. Flowcharts assist programmers and analysts in breaking down problems into smaller parts and examining various operational options [13].

A. Flowchart User

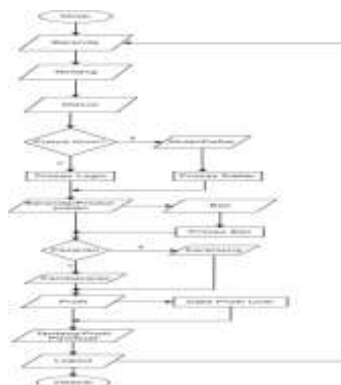
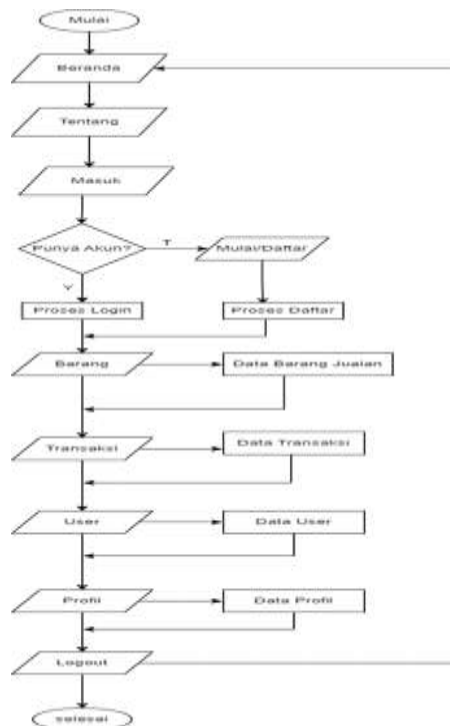


Figure 2. User Flowchart

The user flowchart is shown in Figure 2.2. The app will first display the Home page, then the About menu with a picture of the person who created the app. Register an account or log in directly if you already have one before you can start purchasing items. Once the order is successfully displayed, you will see a page with the user profile, then the About menu or the system creator's profile, and finally, you can log out.

B. Flowchart Admin

**Figure 3.** Flowchart Admin

The admin flowchart is shown in Figure 2.3. The only real difference is that you can add, edit, and delete items from the Items menu. User transaction data is then found in the Transactions menu. The admin profile is then found in the profile menu, after which there is a user menu with user order data. DFDs are often used to characterize a current system or a new system that will be built logically without considering the physical environment where the data is stored or flows. DFDs provide a clear and organized description of the data flow within the system [14].

C. Data Flow Diagram

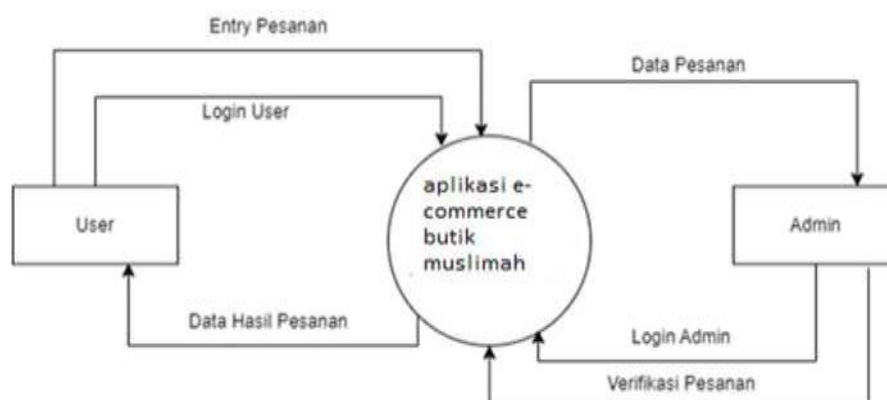
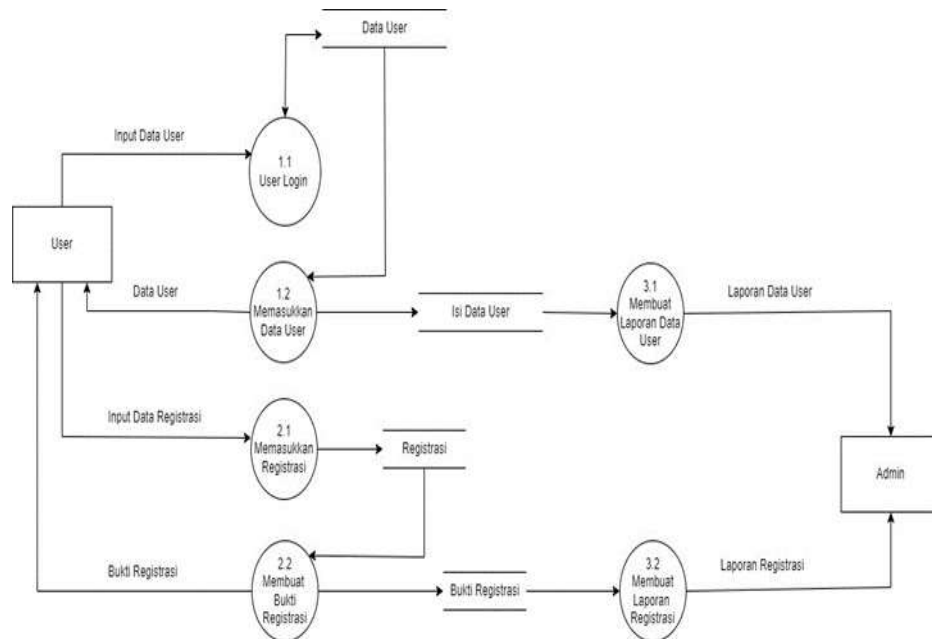


Figure 4. Data Flow Diagram

Figure 4 Data Flow The main system workflow is depicted in the diagram. The admin entity is responsible for ensuring user orders are correct, and the user entity is responsible for selecting what to order and overseeing the order completion.

**Figure 5.** Data Flow Diagram Level 1

A number of procedures are shown in Figure 2.5, illustrating how the system will identify each purchase. The system will then send a purchase report to the administrator based on the evidence obtained. A network model called an entity relationship diagram (ERD) utilizes an abstract data structure managed within the system [15].

D. Entity Relationship Diagram (ERD)

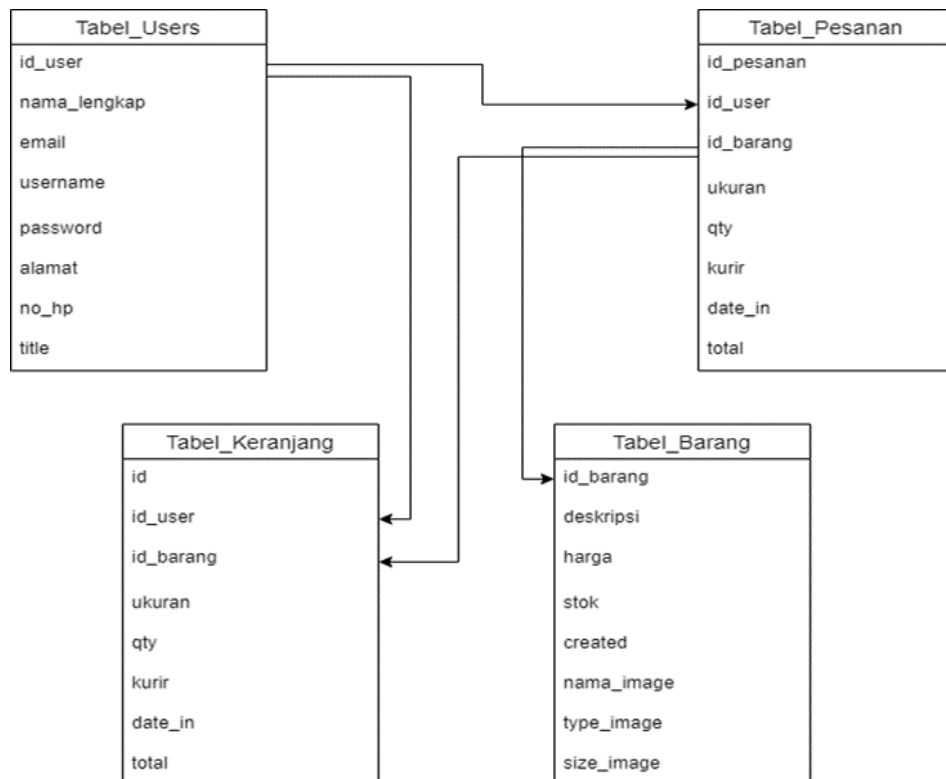


Figure 6. Entity Relationship Diagram (ERD)

As shown in Figure 2.6, creating an entity relationship diagram (ERD) means adding data about entities and their attributes and figuring out how they are related to each other. An association is a link between two groups of things. A link between two things in an entity relationship diagram is called a relationship. A significant link between two things is called a bond.

RESULTS AND DISCUSSION

User Interface Design

1. Home Display

Users can view the products sold in this application on the Home Display. Additionally, a profile description of the application creator is displayed. The profile description of the application creator is visible to users.

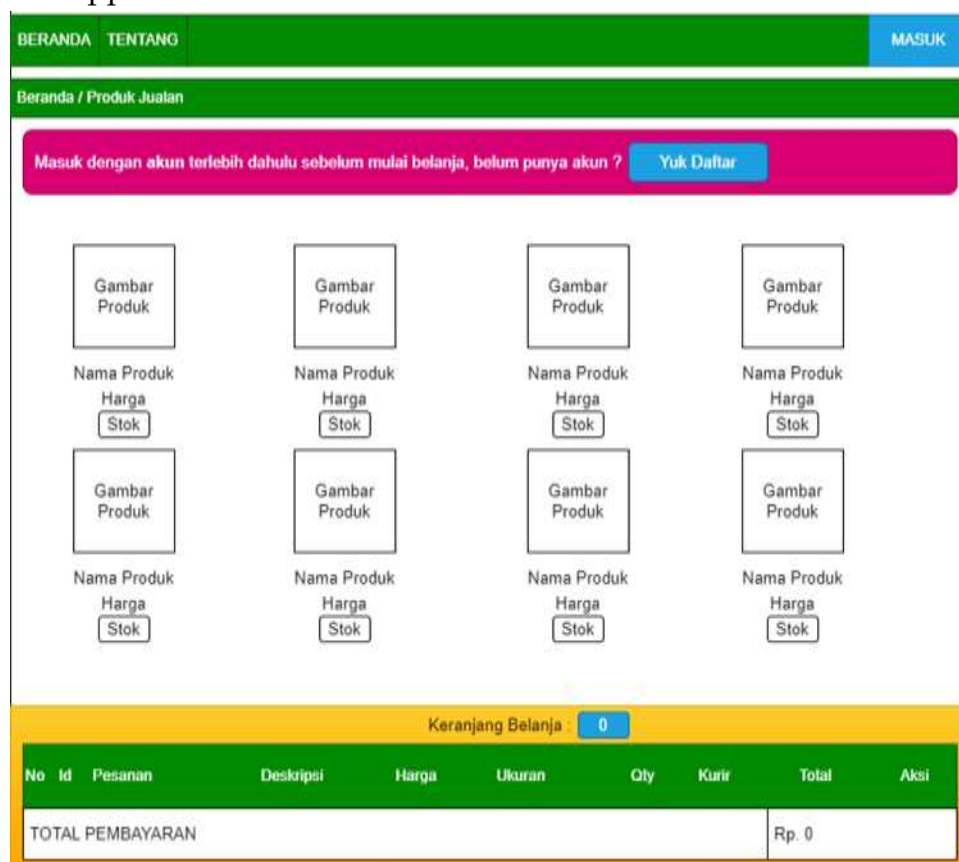


Figure 7. Home View

The homepage, shown in Figure 3.1, allows consumers to view a list of clothing products for sale, starting with the product name, price, stock, and photo.

2. Account List or Registration View

Before accessing the homepage to view products they wish to purchase, users in this Account List View must first register.

Figure 8. Account List or Registration View

In the account list or registration screen shown in Figure 3.2, users must enter their full name, email address, phone number, address, login, and password before they can make a purchase.

3. Login Screen

If a user has already registered and created an account, they can use their username and password to log in directly to this screen.

Figure 9. Login Screen

The login screen can be seen in Figure 3.3. After registering, users already have an account and only need to enter their username and password to access the homepage.

4. Home View

Customers can view and purchase items offered in Home View.



Figure 10. Home View

The homepage is shown in Figure 3.4, which displays a list of clothing products to users upon accessing the site. This display includes the product name, price, photo, and stock level, allowing users to make purchases.

CONCLUSION

Fundamental Finding : This study concludes that the development of an e-commerce application for Muslim boutique products effectively enhances user access to product information and purchasing features, as demonstrated by positive user feedback and improved interaction through the application's interface, including the About menu.

Implication : These findings suggest that integrating clear designer profiles and persuasive informational content within the application can strengthen customer trust, increase purchase intention, and support the growth of small boutique businesses in the digital marketplace.

Limitation : However, the study is limited by its focus on a single boutique context and by the absence of broader usability testing across diverse user groups, which may restrict the generalizability of the system's effectiveness.

Future Research : Further studies are recommended to include comparative analyses with other e-commerce platforms, incorporate advanced features such as personalization and AI-driven recommendations, and evaluate long-term user engagement to enhance the system's adaptability and business impact.

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