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Management Information System Design for Digitalization of Web-based Marketing at The Nafisa Parfume Store

Febrian Hedi Dwiriawan[1*], Pratomo Setiaji[2], Wiwit Agus Triyanto[3]

[1,2,3] Information Systems Program, Faculty of Engineering, Muria Kudus University, Kudus 59327, Indonesia

Corresponding Author Email:201853017@std.umk.ac.id

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ABSTRACT

This study aims to design and develop a web-based management information syste for digital marketing at Nafisa Perfume Store. The system is designed to enhan efficiency in customer data management, inventory control, sales processes, a support data-driven decision-making. The methodology includes observatio techniques, interviews, and system development based on the Waterfall model. Th resulting system features digital transaction recording, structured invento management, data integration, and managerial reporting through an informati dashboard. The system implementation utilizes a MySQL database and PH programming language. System testing was conducted using Black Box techniqu to ensure that all functions operate correctly and meet user requirements. The stu results demonstrate that the developed system effectively digitalizes marketi processes and improves operational efficiency at Nafisa Perfume Store.

1. INTRODUCTION

SMEs in Indonesia still face challenges related to market and marketing, capital or financing, raw materials, technology, human resources, entrepreneurship, management, bureaucracy, infrastructure, partnerships, and institutional issues. Moreover, the impact of COVID-19 has further exacerbated the challenges for SMEs [1]. Micro, Small and Medium Enterprises (MSMEs) have an important role in developing the community's economy [2]. In this era of digitalization, every activity is inseparable from the role of technology [3]. The rapid development of technology in the fields of education, business, office administration, government, and information dissemination plays a significant and vital role in all aspects of life [4]. The use of information technology in the digital era is highly beneficial for entrepreneurs who require accurate, detailed, and comprehensive information sources [5]. The need for information technology is essential as it helps provide fast information services [6]. The benefits of technology can turn something that was once difficult into something easier to accomplish. The easier a task is, the more efficiently it can be completed. It can be said that technology plays a crucial role in modern society [7]. To facilitate sales management, one way to utilize information technology is by developing a system. A system is a crucial phase in the system life cycle, requiring a lengthy and complex process that involves determining information needs, designing information systems, and coordinating individuals with different skills to carry out the planned tasks [8]. The system must include things such as purchase-sales-inventory management [9].

Internet connectivity and information technology provide convenience and greater efficiency in managing data and information [10]. The internet is utilized in various aspects of governance, expected to bring benefits by empowering communities through improved access to information, enhancing government services for citizens, and improving more efficient and streamlined government management [11]. Companies can grow their business by using computerized technology systems that can be accessed anytime and anywhere [12]. In this era of digitalization, humans have become highly dependent on technology [13]. Therefore, the ability to operate IT devices becomes a key asset in the development of online-based businesses. The growth of the business world is closely tied to the evolution of information technology. As a result, entrepreneurs are expected to take advantage of the various innovative solutions provided by this technology [14]. Online businesses, which should have been a solution during the COVID-19 pandemic, have not yet been maximally implemented by partners [15]. Despite this, online business still presents its own challenges for business owners who continue to rely on offline stores. In this case, Nafisa Parfum store is one of the SMEs that have survived through conventional sales by establishing a physical store that customers can visit directly. Therefore, to improve efficiency and ease in managing the store, digitalization is needed in the management of Nafisa Parfum. This can be achieved by designing a management information system that can effectively accommodate the store's needs.

2. RESEARCH METHODOLOGY

This research methodology consists of three main stages: data collection, system development and design, and implementation.

2.1. Data Collection Method

Data collection for designing the management information system at Nafisa Perfume Store was conducted using several methods:

2.1.1. Observation Technique

At this stage, researchers collected data by directly observing activities at Nafisa Perfume Store located in Getas Pejaten Village, Jati District, Kudus Regency. This technique provided deep insights into sales processes, from inventory checks to payment processing. Observation was divided into two categories:

1. **Structured Observation**
   In structured observation, researchers used smartphone cameras to record the sales process flow. This method was useful for systematic data analysis.

2. **Semi-Structured Observation**
   Semi-structured observation did not require note-taking during the process. After the observation, the results were documented. System analysts could also collect data samples. Good planning was essential to ensure effective and efficient observation.

2.1.2. Interview Technique

Interviews were a crucial initial step in system requirements analysis. This method involved direct interaction with users to identify problems and root causes. Interviews not only helped reveal issues but also captured user attitudes. Although interviews were a quick way to gather data, their success heavily depended on the analyst's skills. If the analyst was inconsistent or lacked skills, the information obtained might be inaccurate. Therefore, system analysts needed to quickly adapt to different situations.

With proper understanding and planning, interviews could become highly effective tools for data collection.

2.2. System Development Method

System development followed the Software Development Life Cycle (SDLC) using the Waterfall methodology, also known as the sequential linear model or classic lifecycle. The Waterfall model provides an orderly and sequential approach to the software lifecycle, starting with analysis, design, coding, testing, and support processes.

The system development structure using the Waterfall method for this management information system included the following steps:

2.2.1. Software Requirement Analysis

Users were consulted to define system boundaries and objectives. In this case, researchers conducted direct observations at Nafisa Perfume Store, interviewed the store owner, and collected data to gather the necessary information for system development.

2.2.2. Software Design

This phase involved creating design elements such as Data Structures, Software Architecture, Interface Representation, and Coding Techniques. The requirements from the previous phase were translated into design representations for integration into subsequent programming stages. Researchers determined the system flow and created designs in ERD or UML formats as references for coding steps.

2.2.3. Implementation and Unit Testing

Program design was used to implement the software design. Researchers implemented the previous design phase by creating a MySQL database and coding the system using PHP to ensure proper functionality.

2.2.4. Software Testing

The software was tested comprehensively to ensure system requirements were met. Testing ensured that all components were verified using logical and functional perspectives. This process aimed to ensure that outputs met expectations and reduced errors. Black Box testing techniques were employed.

2.3. System Design Method

System preparation involved system and software design stages within the system development method. This research used two different approaches in system design: Unified Modeling Language (UML) and database design using Entity Relationship Diagram (ERD).

Researchers chose the UML technique for system design because it could identify, describe, and document software systems using visual modeling. UML provides a visual language that allows systems to be modeled and communicated using diagrams and supporting.

2.4. Problem-Solving Method

To address various challenges faced by Nafisa Perfume Store, designing a Management Information System became a strategic and essential step. This section explains the methods used to solve problems based on the presented background. The method consisted of four main points aimed at enhancing operational efficiency and overcoming existing challenges:

2.4.1. Digitalization of Sales Transaction Records

Objective:

Facilitate real-time recording and access to sales transaction data while reducing data loss risks and speeding up data search processes.

Methods:

1. **Development of Digital Sales System Interface:**
   Develop a web-based application to record sales transactions digitally with a simple and user-friendly interface.

2. **Database Development:**
   Develop a database to store sales transaction data with table relationships to enable efficient data storage and retrieval.

3. **User Training:**
   Conduct training sessions for the owner and administrative staff to ensure quick adaptation to the new system.

4. **Monitoring and Evaluation:**
   Provide a monitoring mechanism to evaluate system effectiveness and conduct continuous improvements.

A. Structured Inventory Recording

Objective:
Simplify stock monitoring for managing raw material purchases and sales transactions.

Methods:

1. **Core Instrument Data Collection:**
   Collect data through interviews with the store owner and direct observations to identify necessary instruments that must be included in the system.
2. **Development of Inventory System Interface:**
   Develop a web-based application to manage stock, from inventory checks to raw material purchases, with a simple and user-friendly interface.
3. **Database Development:**
   Develop a database to manage inventory data, allowing for efficient data updates and searches.

B. Data Integration and Reporting

Objective:
Provide a comprehensive overview of project performance and support more accurate management decision-making.

Methods:

1. **Development of Integration Dashboard:**
   Develop a dashboard that integrates data from various modules (inventory management, sales, purchases) to provide a comprehensive overview.

2. **Preparation of Managerial Reports:**
   Prepare managerial reports presenting key information on project performance and operational efficiency.

3. **System Integration:**
   Integrate the information system with analytical tools to support data-driven decision-making.

4. **Feedback and Improvement:**
   Collect feedback from management regarding reports and the dashboard, and make improvements to enhance the quality of presented information.

3. RESULT AND DISCUSSION

3.1. System Analysis and Design

At the system and software design stage, as well as the results of database design, the Unified Modeling Language (UML) technique is used, followed by an explanation using the Entity Relationship Diagram (ERD) and table relationships.

3.1.1 Software System Design

The designed software system is as follows:

a. Business Use Case Diagram

Figure 1 illustrates the business process flow design for the management information system development for project management and procurement at Toko Nafisa Parfum.

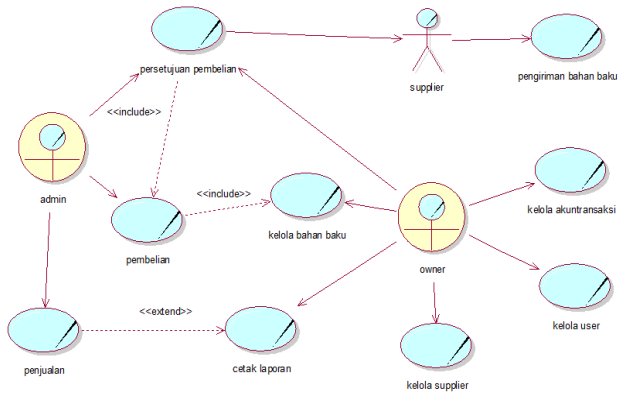

Figure 1. Business Use Case Design of a Management Information System for Digitalization of Marketing at the Nafisa Perfume Store

b. System Use Case Diagram

In the system use case, the actors involved and the activities performed by the system are explained. The design of the management information system for web-based digital marketing at Toko Nafisa Parfum, as illustrated in Figure 2, depicts the system use case process.

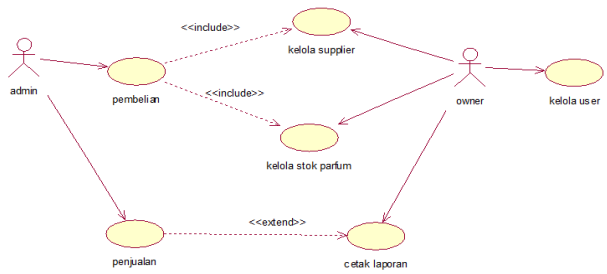

Figure 2. System Use Case Design of a Management Information System for Digitalization of Marketing at the Nafisa Perfume Store

c. Class Diagrams

Class diagrams provide an overview of software and systems and their relationships. Figure 3 shows the relationship between the class test parts that are created and connected between classes.

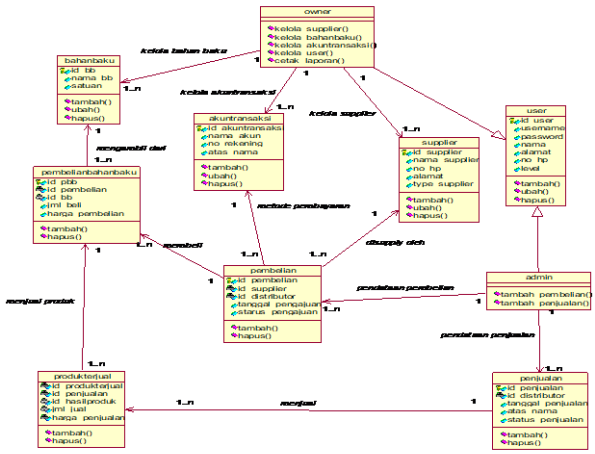

Figure 3. Class Diagram Design of a Management Information System for Digitalization of Marketing at the Nafisa Perfume Store

3.1.2 Database Design

a. Entity Relationship Diagrams

Entity Relationship Diagram (ERD) is a database design model used to determine the attributes of entities or objects related to their relationships. The following is a database design with ERD created in the system after completing the descriptive attributes in Figure 4.

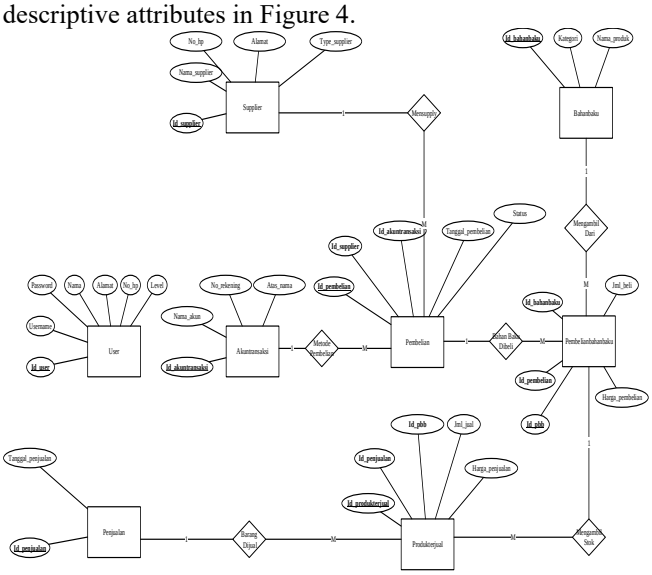

Figure 4. Entity Relationship Diagram Design of a Management Information System for Digitalization of Marketing at the Nafisa Perfume Store

b. Table Relations

The relationships between tables in the MySQL database are as follows. In the design of a management information system for digitalizing marketing at the Nafisa perfume shop, it is shown in Figure 5.

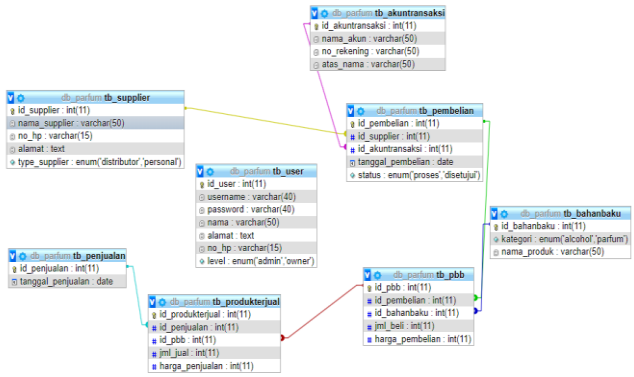

Figure 5. Table Relation Design of a Management Information System for Digitalization of Marketing at the Nafisa Perfume Store

3.2. Program View

At this stage the researcher used the bootstrap 5 framework to create a user interface that is easy to operate (user friendly). The following is a program display of the management information system for digitalizing marketing at the Nafisa perfume shop.

3.2.1 Login Page Display

The Login page is the initial display when opening the program for all users as in Figure 6.

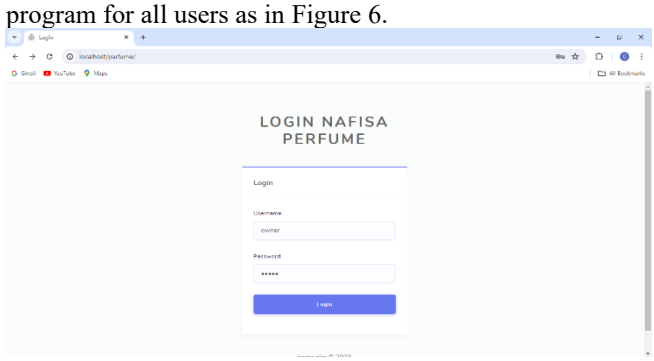

Figure 6. User Interface Login Page Design of a Management Information System for Digitalization of Marketing at the Nafisa Perfume Store

3.2.2 Home Page View

The home page or main page is the display that will appear after the user has logged in to the program, it can be seen in Figure 7.

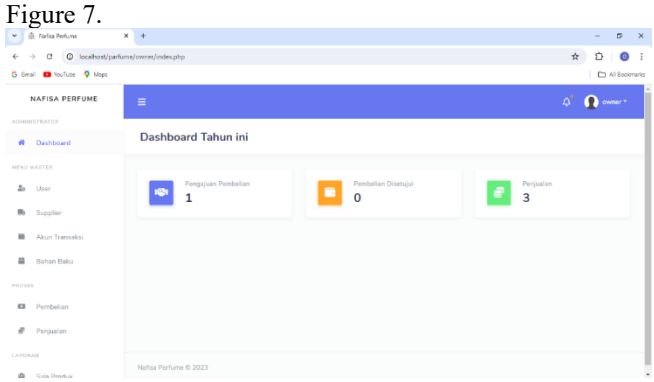

Figure 7. User Interface Hom Page Design of a Management Information System for Digitalization of Marketing at the Nafisa Perfume Store

3.2.3 Sales Page View

The Sales page displays sales data by date as in Figure 8.

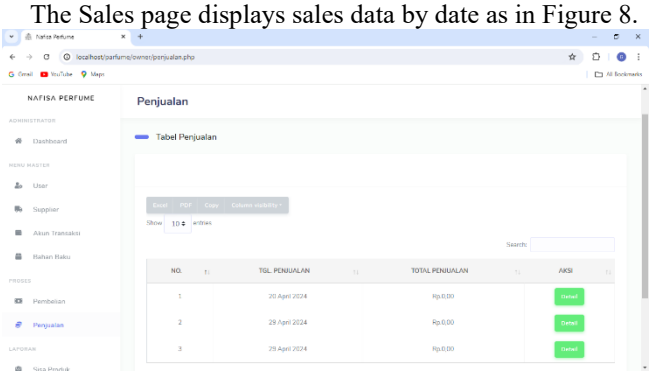

Figure 8. User Interface Sales Page Design of a Management Information System for Digitalization of Marketing at the Nafisa Perfume Store

4. CONCLUSIONS

The development of a web-based management information system for Nafisa Perfume Store demonstrates a strategic step toward digitalizing marketing and improving business operations. Through this system, various operational processes, such as inventory management, sales transactions, and customer data management, can be streamlined and efficiently integrated.

By implementing the system design using comprehensive methods such as observation, interviews, and system development with the waterfall model, the project successfully addressed existing challenges and provided practical solutions, including real-time sales data management, structured stock monitoring, and comprehensive data integration.

The system's implementation contributes to enhancing the store's efficiency, decision-making capabilities, and overall customer experience. These improvements signify an important move towards digital transformation, enabling Nafisa Perfume Store to remain competitive in an increasingly digital marketplace.

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