CHAPTER I
INTRODUCTION

1.1. Background

The development of information technology has driven operational transformation and marketing strategies in Small and Medium Enterprises (SMEs). Digitalization is an important factor in improving the efficiency of business management, expanding market reach, and increasing competitiveness in the midst of increasingly competitive economic competition [1], [2]. This is very relevant for SMEs engaged in traditional crafts, where the value of the product lies not only in the function, but also in the cultural aspects and uniqueness of the motifs inherent in each work [3]. One of the SMEs that has great potential to utilize digital technology is the Dina Woven Fabric UKM located in Ntobo Village, Bima City. This SME plays a significant role in the preservation of Bima's traditional woven fabrics and community empowerment through the creative economy sector [4].

Despite having great potential, Dina's Woven Fabric SMEs still face various significant obstacles in managing their product operations and marketing. In terms of data management, all activities of recording sales transactions, managing fabric stock, and preparing reports are still carried out manually using a simple notebook or worksheet. This manual approach is prone to recording errors, delays in preparing reports, and difficulties in accurately tracking transaction history [5]. The unavailability of a centralized record-keeping system results in less accurate data and complicates strategic decision-making, which can ultimately reduce the operational effectiveness of SMEs [6].

In terms of marketing, Dina's Woven Fabric SMEs still rely on traditional methods, such as promotion through direct communication, limited exhibitions, or word-of-mouth sales. This strategy resulted in limited market reach and limited product penetration to potential consumers from outside the region [7]. In fact, Bima's typical woven fabric has a high selling value because of the uniqueness of the motifs, the quality of the materials, and the inherent cultural value. The lack of use of digital media hinders SMEs in building broader brand awareness, reduces their ability to compete with similar products, and limits consumers' access to product information quickly and accurately [1], [8].

In addition, UKM Dina does not have a system that is able to provide personalized product recommendations based on consumer preferences, such as the type of fabric, motif, color fastness, and price. The absence of this feature is a major obstacle, especially for consumers outside the region who cannot check the product directly [9]. As a result, the sales potential of this consumer segment has not been maximized, even though the demand for traditional fabrics with distinctive motifs is quite high. The inability to provide recommendations that are in line with consumer preferences also has an impact on the shopping experience, which can reduce consumer satisfaction and loyalty to SME products [10].

In the context of SME digitalization, several previous studies have shown the importance of implementing web-based information systems to improve operational efficiency and expand market reach. Albalkhi and Komalasari [11] developed a web-based sales information system in the form of e-commerce for DANISA Collection MSMEs, which provides product catalog features, shopping carts, and computerized stock recording so that it can help MSME actors manage transactions more effectively. Agustina et al. [12] designed a website-based sales information system for the optimization of MusiCraft MSMEs in Palembang City; The test results show that the system is able to help the process of promoting and selling handicraft products online. Ahyati et al. [13] developed a web-based sales information system for Sasirangan fabric MSMEs, which facilitates transaction recording, product management, and online ordering so as to expand the marketing reach.

In terms of decision-making methods, Wonoseto and Alfiandy applied Fuzzy AHP in the lending decision support system at the Prosperous Credit Cooperative. The study showed that Fuzzy AHP was able to overcome the uncertainty of assessing criteria, such as income, number of dependents, and payment history, through the use of fuzzy numbers so that the resulting decision became more objective [14]. Another study discussed the application of personalized recommendation algorithms for cultural and creative products based on the Fuzzy Decision Support System. The results of the study show that the fuzzy approach is able to help the system in understanding user preferences more flexibly so that the product recommendations produced are more in line with user needs [15]. In addition, research on the personalized route recommendation system using the F-AHP-Express method shows

that the Fuzzy AHP method is able to produce more measurable criteria weights and support a more accurate decision-making process based on user preferences [16].

When compared to the TOPSIS and SMART methods, the Fuzzy AHP method has the advantage of handling the subjectivity and uncertainty of user preference values so that the weight of the resulting criteria is more accurate and realistic. Fuzzy AHP is able to accommodate the linguistic and ambiguity assessments that often arise in qualitative criteria assessments, in contrast to classical AHP which requires a definite score and is less flexible to uncertainty [17]. The TOPSIS method is effective in ranking alternatives based on distance to the ideal solution, but it is sensitive to the scale of the data and the weight of the criteria so that the stability of the ranking can be reduced [18]. SAW and WP have advantages in the form of ease of implementation and computational efficiency, but tend to be less flexible in handling interactions between subjective and uncertain criteria or preferences [19], [20]. Meanwhile, the MOORA method is known to provide stable ranking results, lightweight computation, and is insensitive to data scale, but does not directly address the uncertainty of subjective preferences, so it can be less realistic if the weights are determined linguistically [21]. The integration of Fuzzy AHP and MOORA has been proven to take advantage of the advantages of both methods, namely the realistic weights of Fuzzy AHP and stable rankings of MOORA, resulting in a more objective and efficient recommendation process in various decision-making cases.

Based on these problems and needs, this study proposes the development of a Web-Based Woven Fabric Sales Information System with the Integration of the AHP and MOORA Fuzzy Methods as a strategic step to increase the effectiveness of sales management, expand marketing reach, and provide product recommendation services that suit consumer preferences. This system is expected to be able to support the digital transformation of Dina Woven Fabric SMEs and strengthen the competitiveness of Bima's typical woven fabric products at the national level.

1.2. Problem Formulation

Based on the background that has been described, the formulation of the problem in this study is:

1. How to design and build a web-based woven fabric sales information system for Dina SMEs in Ntobo Village?

2. How to integrate the Fuzzy AHP method to determine the importance weight of each woven fabric selection criteria?
3. How to apply the MOORA method in determining the best woven fabric product alternatives based on predetermined criteria?
4. How can this system help consumers in choosing products faster, more precisely, and according to their needs?

1.3. Research Objectives

This research aims to create a Web-Based Sales Information System with the Integration of Fuzzy Methods AHP and MOORA.

1.4. Research Benefits

With this research, it is hoped that it can provide benefits for several related parties, including:

1. For the Author of this research, it can be a means to implement the knowledge gained during lectures, especially in the field of information systems and decision support systems. In addition, the author also gained practical experience in designing, building, and testing a web-based information system that is integrated with the Fuzzy AHP and MOORA methods.
2. For Consumers

   This research makes it easier for consumers to find woven fabric products that suit their preferences, both in terms of motifs, colors, prices, and types of fabrics. With an integrated decision support system, consumers can make product selection faster, more precisely, and based on data even though they cannot be present directly at the location.
3. For Woven Fabric SMEs, the information system built can help SMEs in managing product, stock, and transaction data in a more structured manner. In addition, the system also supports online marketing strategies so that the market reaches wide, as well as provides periodic reports on demand trends that are useful in business decision-making.
4. For Weavers and Tailors

   This research can provide an overview of the motifs, types, and colors of fabrics that are most in demand by the market, so that production can be more

in line with consumer needs. This is expected to increase productivity, reduce the risk of unabsorbed stock, and improve the welfare of artisans involved in Dina's SMEs.

5. For Academics and Further Researcher this research can be a reference in the development of science, especially related to the application of the Fuzzy AHP and MOORA multi-criteria methods to decision support systems in the culture-based creative industry sector.

1.5 **Problem Limitations**

In order for this research to be more directed and not to expand beyond the scope, the limits of the problem are set as follows:

1. The object of the research is focused on the Dina Woven Fabric UKM in Ntobo Village, which is a research partner and a case study in the development of a sales information system.
2. The products handled by the system are only in the form of woven fabrics produced by SMEs Dina, which does not include other products such as apparel or weaving accessories.
3. The criteria for selecting products in the decision support system are limited to four aspects, namely the type of fabric, motif, color fastness, and price, according to the main needs of consumers.
4. The methods used in the decision support system are Fuzzy AHP for weighting criteria and MOORA for alternative product rankings. Other methods beyond that are not discussed in this study.
5. The developed system is web-based, so it can only be accessed through internet-connected devices. Mobile-based apps (Android/iOS) were not included in the scope of the study.
6. The system's features are focused on managing product data, sales, and decision support systems for product recommendations. Additional features such as online payment integration, automated expeditions, and third-party marketplaces are not discussed in depth (only moderately simulated when needed).

7. System testing is carried out with reference to the aspects of functionality and usability, so it does not include in-depth testing of the system's security level or system performance on a large scale.