



The Use of Artificial Intelligence for Marketing Community Economic Products in West Sumatra

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Abstract

The development of digital technology has brought significant changes in various aspects of life, including marketing. Artificial Intelligence is one of the innovations that play a role in increasing marketing effectiveness, especially for small and medium enterprises. This research aims to analyze the use of Artificial Intelligence in marketing community economic products in West Sumatra, or identify the benefits and challenges faced by business actors in applying Artificial Intelligence technology to market their products. The method used in this research is a qualitative approach with interview and observation techniques. Data was collected from small and medium enterprises in West Sumatra that have used Artificial Intelligence in their marketing strategies. The results showed that the application of Artificial Intelligence in marketing community economic products in West Sumatra has a positive impact. The use of Artificial Intelligence in marketing has great potential in increasing the competitiveness of local products and expanding the market for businesses in West Sumatra. Thus, the use of Artificial Intelligence in marketing can be an innovative solution in encouraging economic growth in the region.

INTRODUCTION

The development of science and technology at the end of the 21st century has provided a broad space in all aspects of human life. Very high human mobility in carrying out social and economic activities has had a major impact on improving the welfare of society and the nation. The development of science is directly proportional to the economic and social dimensions that cannot be separated from human life today. Competition and achievement are part of what humans always aim for in obtaining economic benefits, of course the aspect of competition is something that cannot be avoided. To Therefore, a platform is needed as a means for product promotion and marketing among Micro, Small and Medium Enterprises (MSMEs). One form of convenience offered in the current eradigitalization is in the form of artificial intelligence, namely Artificial Intelligence as a tool in providing services and conveniences for micro, small and medium enterprises, which provides convenience and a wide range of access in the community (Adolph, 2016; Mumtaz et al., 2023; Mutaqin et al., 2022; Pongtambing et al., 2023; Zahra Salsabilla et al., 2023).

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Economic principles are the theoretical basis that must be implemented in economic activities so that competition between economic actors runs well and with dignity. Basically, marketing is a social and managerial process where individuals and groups get what they need through the creation and exchange of products and values with others. The managerial process is the process of planning and determining the conception, promotion and distribution of ideas, goods and services to create exchanges for individual goals and society at large. Judging from the aspect of technological progress, many technologies have emerged that help business and marketing processes, ranging from the internet, robotics, information technology to Artificial intelligence technology that is able to resemble the role of humans themselves.

Artificial intelligence is a word that is often feared by many people. There are two major opinions about artificial intelligence: first, the opinion that scares many people about the role of artificial intelligence in replacing human roles (Ardita et al., 2023; Pakpahan, 2021; Restiawan & Ula, 2023; Trenggono & Bachtiar, 2023). Many think that artificial intelligence will disrupt the future of humans because many work functions that are usually performed by humans will be replaced by machines that have intelligence more or less like human intelligence. The second opinion, which states that artificial intelligence has benefits, is that the utilization of artificial intelligence technology has entered into several aspects of life, such as in the fields of education, health, military, economic aspects and even the business world.

In the world of business and marketing, many practices are applied using artificial intelligence technology in the form of smart devices that are utilized such as chatbots. The marketing process has shifted in its implementation, from the application of conventional and manual patterns to marketing patterns that utilize technology or known as digital marketing. Many smart applications have benefited consumers. According to a mega system study, 55% of consumers who have used it feel comfortable interacting with businesses or companies that use the technology. While 38% of consumers agree that artificial intelligence in the future can improve customer service. Based on the summary of Sampras, marketing and sales divisions are among the organizations that prioritize artificial intelligence and machine learning technologies to achieve success more than other organizations or 40%. According to Srihari Sasikumar, product director of simpler businesses can utilize artificial intelligence to improve digital marketing in two areas, namely on the back end and customer facing. On the back end artificial intelligence can help predict demand for products build customer profiles, conduct act buying programs and so on. On the customer facing side artificial intelligence can be used to improve the customer experience so that it will strengthen the brand and increase sales.

Apart from that, of course marketing theory as part of the answer in the marketing aspect of the business world is a must, so that information and community preferences will become a product that can be accessed thoroughly. The American Marketing Association says that marketing strategy is the result of the work performance of business activities related to the flow of goods and services from producers to consumers.

Marketing strategy is the most important part in achieving the goals of marketing itself, disruption in marketing is in line with the industrial revolution 4.0 where the position of the role of technology becomes a part that helps marketing methods and stages that have been packaged in marketing mix theory. Marketing theory will not have a big impact in the business world and modern business competition if the theory is not modified with an information technology approach. Current business developments are not limited to the big

industry level which is supported by financial strength and a wide market share but economic resilience is very visible in the strength of the home industry that grows and develops in the lower strata of society. Micro, Small and Medium Enterprises (MSMEs) are one of the pillars of economic strength that has resilience to the monetary crisis that hit Indonesia in 1998 (Agil, 2020; Fitri Zakiyah et al., 2022). The evidence can be seen how Micro, Small and Medium Enterprises (MSMEs) as the basis of the people's economy can survive the onslaught of the monetary crisis which became a large industry losing strength from all sides, but Micro, Small and Medium Enterprises can grow and survive at that time.

The large role of Micro, Small and Medium Enterprises in maintaining and building the community's economic sector cannot be separated from the weaknesses faced by Micro, Small and Medium Enterprises (MSMEs) to maintain their business in the community (Al Farisi et al., 2022; Hadi & Zakiah, 2021; Makhrani et al., 2022; Siti Nurhalita & Imsar, 2022; Windusancono, 2021). The weakness of Micro, Small and Medium Enterprises is not limited to the capital side but arises from the mastery of technology-based promotion, this is because Micro, Small and Medium Enterprises (MSMEs) that grow in the community have limited Human Resources in the field of information technology (Gumulya, 2018). Related to the weak side of technology-based promotion, thus making the bargaining power of Micro, Small and Medium Enterprises (MSMEs) in modern society slowly marginalized. revealed from the results of his research that the utilization of digital platforms by Micro, Small and Medium Enterprises (MSMEs) in Indonesia is still low and not effective. The number of Micro, Small and Medium Enterprises (MSMEs) recorded in Indonesia is 10 million units registered in the OSS system in 2023, only 15% of that number have used digital platforms. the relationship between e-commerce adoption and the performance of Micro, Small and Medium Enterprises is proven to be positive and significant so that it can be concluded that company performance will increase when adopting e-commerce.

The problems faced by Micro, Small and Medium Enterprises (MSMEs) above are certainly very unfortunate, that the Micro, Small and Medium Enterprises sector has reliable and qualified capabilities and plays an important role in the national economic scene. Micro, Small and Medium Enterprises (MSMEs) have a proportion of 99.99% of the total number of business actors in Indonesia or 56.54 million units. Micro, Small and Medium Enterprises (MSMEs) have been able to prove their existence in the Indonesian economy. When the storm of the monetary crisis hit Indonesia in 1998, small and medium-sized businesses were relatively able to survive compared to large companies. This is because the majority of small-scale businesses are not too dependent on large capital or loans from outside in foreign currency.

Thus, when there are exchange rate fluctuations, large-scale companies that generally always deal with foreign currencies are the most likely to experience the impact of the crisis. However, Micro, Small and Medium Enterprises (MSMEs) in Indonesia have weaknesses, namely the lack of capital both in quantity and source, where the growth of credit disbursed by the banking sector is only 13.6%, lack of managerial ability and operating skills in organizing and limited marketing. In addition, there is also unfair competition and economic pressures that result in a narrow and limited scope of business. However, all of these problems can be resolved with several policies that open up opportunities for Micro, Small and Medium Enterprises (MSMEs), to be able to access the banking industry easily. statistical data shows that the number of small micro and medium business units is close to 99.98% of the total business

units in Indonesia with a contribution of 56% of total GDP in Indonesia. This reflects the high significance of the role of Micro, Small and Medium Enterprises (MSMEs) for Indonesia's economic equality.

In addition to Micro, Small and Medium Enterprises (MSMEs) having strengths, of course, some Micro, Small and Medium Enterprises (MSMEs) experience several problems faced in developing a business that is full of competition between fellow Micro, Small and Medium Enterprises (MSMEs) and industries that have strength in capital and market share. the problems faced by Micro, Small and Medium Enterprises (MSMEs) in Indonesia include capital problems, weak financial management, lack of marketing strategies, small access to raw materials and market share. This has led to a decline in the competitiveness of Micro, Small and Medium Enterprises (MSMEs) in facing competition in the modern era (Firmansyah et al., 2021; Muhammad Ikhsan & Muhammad Hasan, 2020; Sumaryana, 2018; Utami et al., 2023).

Currently, Micro, Small and Medium Enterprises (MSMEs) have limitations in information technology-based marketing management (Akhmad & Purnomo, 2021; Jefri & Ibrohim, 2021; Lubis & Junaidi, 2016; Retalia et al., 2022). The problems faced by Micro, Small and Medium Enterprises (MSMEs) include (i) Weakness in obtaining market opportunities to increase market share, (ii) Weakness in the capital structure and limitations in obtaining access to capital sources, (iii) Weakness in the field of organization and human resource management, (iv) Limited business network cooperation between small entrepreneurs (marketing information system (v) A less conducive business climate, due to mutually deadly competition. (vi) Coaching that has been carried out is still less integrated and there is a lack of trust and public concern for small businesses.

West Sumatra is one of the provinces in Indonesia with the number of Micro, Small and Medium Enterprises (MSMEs) totaling 296,052 Data from the National Statistics Agency Accessed on January 08, 2024. being the province with the eighth largest number of Micro, Small and Medium Enterprises in Indonesia. The declaration of West Sumatra as a world tourist destination and halal tourist destination in Indonesia certainly provides ample opportunities for the development of Micro, Small and Medium Enterprises (MSMEs) in West Sumatra (Fajriwati et al., 2022; Helmawati et al., 2017). As a tourist destination, of course West Sumatra has a great opportunity to promote superior products in the fields of food, crafts and art to the international community. In 2013, Indonesia through the Ministry of Tourism has set twelve provinces to become leading halal tourist destinations, namely West Nusa Tenggara, Nangro Aceh Darussalam, West Sumatra, Riau, Lampung, Banten, Jakarta, West Java, Central Java, Yogyakarta, East Java, and South Sulawesi. Indonesia has been widely recognized by the world as the best halal tourism for its victory in the event "*The Works Halal Travel Summit & Exhibition 2015*."

From the results of research findings and data revealed, that Micro, Small and Medium Enterprises have a level of competitiveness or strength that can be relied upon in building the community's economy. The advantages also intersect with the weaknesses possessed by Micro, Small and Medium Enterprises, especially in the aspects of marketing and competitiveness of Micro, Small and Medium Enterprises (MSMEs) in reaching market share so as to raise problems in internal Micro, Small and Medium Enterprises (MSMEs) in West Sumatra. So this problem requires constructive and innovative solutions in helping the difficulties faced by Micro, Small and Medium Enterprises (MSMEs) so that Micro, Small and Medium Enterprises (MSMEs) can grow and develop in improving the community's economy. Data

on Micro, Small and Medium Enterprises (MSMEs) in West Sumatra released from the LAKIP Year 2022 of the West Sumatra Cooperative Office shows that the growth rate of Micro, Small and Medium Enterprises (MSMEs) has not been evenly distributed in each regency and city in West Sumatra. The growth center of Micro, Small and Medium Enterprises (MSMEs) is centered in urban areas while the potential of agricultural and fishery businesses in several regions has not been maximized. Capital and technology mastery are still the main problems for most Micro, Small and Medium Enterprises (MSMEs) in West Sumatra.

METHODS

This study uses a qualitative research model with the development of research and development type is a process or steps to develop a new product or improve existing products, which can be accounted for (Engkizar et al., 2023; Oktaria & Putra, 2020; Zafirah et al., 2018). Research and Development aims to develop, test the usefulness and effectiveness of the products developed, which can be in the form of technology products, materials, organizations, methods, strategies, models, media, learning aids and others. The characteristic of Research & Development is that the research is in the form of a “cycle” which begins with a need, a problem that requires a solution to a particular product. The model used in this research is the Analyze-Design-Develop-Implement-Evaluate model. This research was conducted from March to October 2020, where researchers collected data on Micro, Small and Medium Enterprises (MSMEs) in several districts or cities in accordance with the case study of this research. Then the data is processed and analyzed, system design, application development, implementation of the designed application and evaluation.

RESULT AND DISCUSSION

Analysis

The analysis stage is the initial stage in finding information and problems and defining system requirements. The following are some of the analyzes carried out in this study, namely is needs analysis.

Needs analysis is the first stage activity that must be carried out before designing the system to be created, so an analysis is needed which aims to find out Micro, Small and Medium Enterprises (MSMEs) in West Sumatra. That Micro, Small and Medium Enterprises (MSMEs) have a level of competitiveness or strength that can be relied on in building the community's economy. The advantages also intersect with the weaknesses possessed by Micro, Small and Medium Enterprises (MSMEs), especially in the aspects of marketing and competitiveness of Micro, Small and Medium Enterprises in reaching market share so as to raise problems in internal Micro, Small and Medium Enterprises (MSMEs) in West Sumatra. So this problem requires constructive and innovative solutions in helping the difficulties faced by Micro, Small and Medium Enterprises (MSMEs) so that Micro, Small and Medium Enterprises (MSMEs) can grow and develop in improving the community's economy. Data on Micro, Small and Medium Enterprises (MSMEs) in West Sumatra released from the LAKIP Year 2022 of the West Sumatra Cooperative Office shows that the growth rate of Micro, Small and Medium Enterprises (MSMEs) has not been evenly distributed in each regency and city in West Sumatra. Needs Analysis consists of analyzing user needs and analyzing system needs.

Design

The design stage is a description of the system that will run based on the needs of the previous stage. This stage consists of general system design, UML design, database design. The first, usecase diagram. Use case diagrams show the relationship between users or “actors” and the system to be built, how actors interact with it. In the context of this research, the use case diagram serves to illustrate how Micro, Small and Medium Enterprise owners and marketing analysts can utilize an AI-based system to improve their digital marketing effectiveness. This diagram helps identify the key processes performed in the system, such as market trend analysis, marketing strategy recommendation, advertising campaign creation, and campaign performance monitoring.

The second, activity diagram. Activity diagram is a graphical modeling tool that can be used to describe the activities performed by actors against the system, as well as the system itself, and also describes how the designed application program modules work.

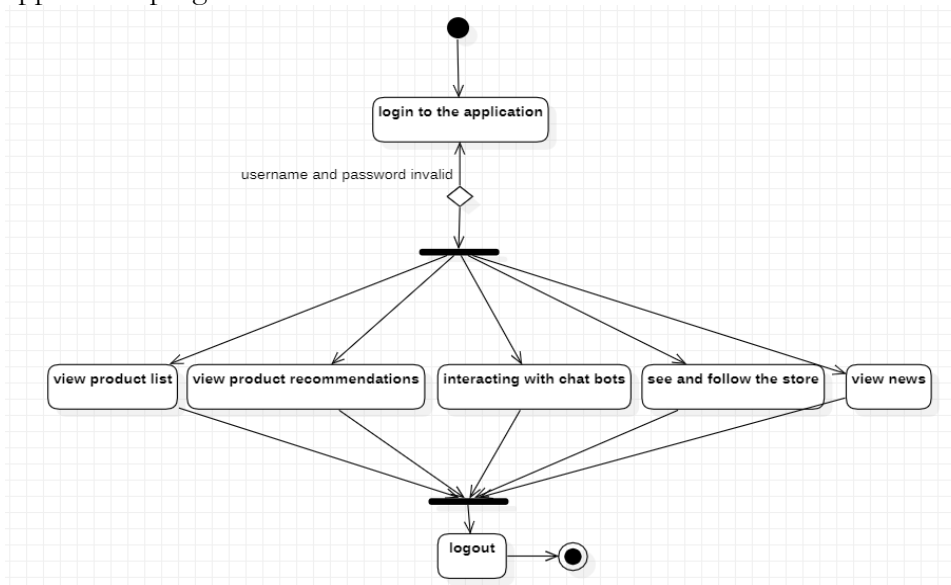


Fig 1. Activity Diagram

The third, design database. The database design in the figure above describes the data structure required to support the operation of an e-commerce platform that involves interactions between users, stores, products, and news content. There are several main entities such as products, stores, and users, which are interconnected through relational tables such as shopping cart, user wishlist, and product reviews. Each product is associated with a category, and users can follow stores or interact with published news content. In addition, there are tables that manage Micro, Small and Medium Enterprises (MSMEs) information by geographic city and city admins that oversee the activities of Micro, Small and Medium Enterprises (MSMEs) in a particular region. This database is designed to record and manage data that supports the digital marketing process, user behavior analysis, product recommendations, as well as feedback from customers, all of which can be integrated with artificial intelligence technology to support the digital marketing strategy of Micro, Small and Medium Enterprises (MSMEs).

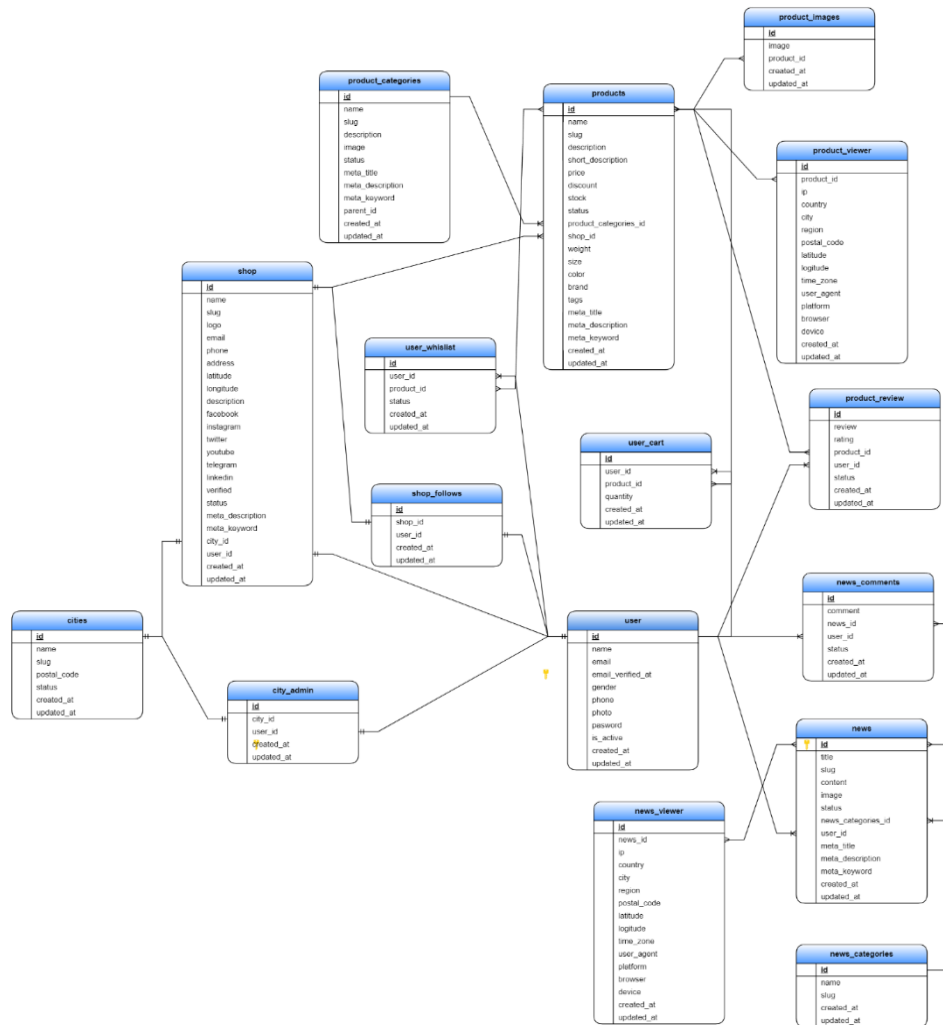


Fig 2. Design Database

The database design in the figure above describes the data structure required to support the operation of an e-commerce platform that involves interactions between users, stores, products, and news content. There are several main entities such as products, stores, and users, which are interconnected through relational tables such as shopping cart, user wishlist, and product reviews. Each product is associated with a category and users can follow stores or interact with published news content. In addition, there are tables that manage Micro, Small and Medium Enterprises (MSMEs) information by geographical city and city admins that oversee the activities of Micro, Small and Medium Enterprises (MSMEs) in a particular region. This database is designed to record and manage data that supports the digital marketing process, user behavior analysis, product recommendations, as well as feedback from customers, all of which can be integrated with artificial intelligence technology to support the digital marketing strategy of Micro, Small and Medium Enterprises.

Develop

The next stage is development. This development stage is in the form of making machine learning algorithms and creating a web platform (coding). Coding is the creation of a program by translating previously designed data into PHP, MySQL and Javascript programming language program code using Laravell1 which has been provided as a framework in making applications.

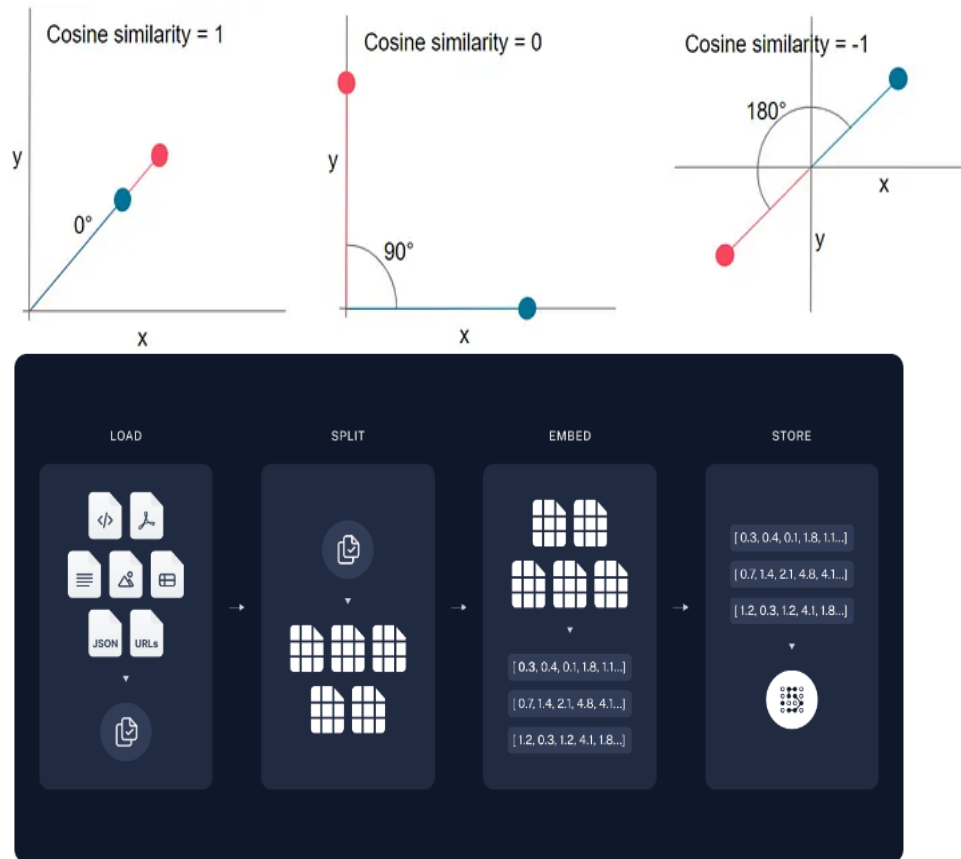


Fig 3. Desain develop

After the Load, Split, Embed, and Store processes, the next stage in Retrieval-Augmented Generation is Retrieval and Generation. When the model receives a question, it performs a search for relevant information by matching the question embedding with the stored data embedding, so that the most suitable information can be found. After that, the model processes the search results in the generation stage, where the retrieved information is converted into a natural and informative text response using Natural Language Generation techniques, ensuring that the answer provided matches the context of the question.

This discussion aims to explain how the system designed in this research is able to provide concrete solutions for Micro, Small and Medium Enterprises (MSMEs) in West Sumatra, especially in overcoming the challenges of digital marketing and expanding market reach. Based on the results of the analysis conducted, it appears that Micro, Small and Medium Enterprises (MSMEs) in this region face the problem of imbalanced growth, with a greater concentration of development in urban areas, while the potential in the agriculture and fisheries sectors in rural areas is still not optimal.

The system is designed to accommodate four main actors, namely Super Admin, Regional Admin, Seller, and Customer, each of which has a specific role in managing and interacting with the system. The Super Admin is in charge of managing the system as a whole, Regional Admins oversee store activities at the district or city level, Sellers are responsible for promoting products, and Customers as end users who interact directly with the platform to purchase products. This design makes the platform more structured and functional for the various needs of Micro, Small and Medium Enterprises (MSMEs) and users.

In terms of technology, the collaborative filtering algorithm used allows

the system to provide personalized product recommendations for customers. This is useful for increasing customer satisfaction by displaying products that match their preferences, thus increasing the potential for transactions. The algorithm calculates the similarity of user preferences through cosine similarity, providing recommendations based on other users' ratings and interactions with the product. In this way, the platform provides a more relevant experience and makes it easier for customers to find products of interest.

Retrieval-Augmented Generation techniques are also applied in this platform to enrich the information search process for users. By utilizing information from various external sources embedded in the database, Retrieval-Augmented Generation allows the platform to provide more informative, relevant, and contextual answers for users. This can help customers get a more detailed explanation of the product, potentially increasing trust and purchasing decisions.

In terms of interface design, the platform provides important pages, such as product pages, chatbot pages, categories of Micro, Small and Medium Enterprises (MSMEs) by region, and shopping carts, which are easily accessible to users. This user-friendly interface is designed so that customers can interact with Micro, Small and Medium Enterprises products more comfortably and efficiently. By providing features such as live chat connected to chatbots, the platform supports direct interaction between customers and Micro, Small and Medium Enterprises (MSMEs), which is very important to increase engagement and maintain customer satisfaction.

Overall, this platform not only helps improve the access of Micro, Small and Medium Enterprises (MSMEs) to digital marketplaces that present products according to keywords searched by customers, but also supports the improvement of the competitiveness of Micro, Small and Medium Enterprises (MSMEs) in West Sumatra. Through user data analysis and recommendations based on Artificial intelligence, Micro, Small and Medium Enterprises (MSMEs) can better understand market needs and respond appropriately. The adoption of digital technology is expected to help Micro, Small and Medium Enterprises (MSMEs) in rural areas that have not been optimally developed to maximize local potential, thereby achieving more equitable economic growth throughout West Sumatra.

CONCLUSION

This research produces a product in the form of a digital platform designed to support the development of Micro, Small and Medium Enterprises (MSMEs) in West Sumatra, especially in facing marketing and competitiveness challenges in the digital era. Utilizing this research allows Micro, Small and Medium Enterprises (MSMEs) to reach a wider market, provide product recommendations that match customer preferences, and improve marketing efficiency. Features such as live chat and chatbot strengthen interactions between customers and Micro, Small and Medium Enterprises (MSMEs), which play an important role in building customer trust and loyalty. Overall, this platform not only expands market access for Micro, Small and Medium Enterprises (MSMEs), but also provides more equitable opportunities for Micro, Small and Medium Enterprises (MSMEs) in rural areas to maximize their local potential. The results of this study are expected to make a significant contribution in encouraging equitable economic growth in West Sumatra through strengthening the competitiveness of Micro, Small and Medium Enterprises (MSMEs) with the Smart Micro, Small and Medium Enterprises (MSMEs) application.

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