

Implementation of Artificial Intelligence (AI) in Digital Marketing Management in the Era of 5.0

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Abstract. The development of artificial intelligence technology presents a multitude of opportunities, some of which include the automation of marketing, the analysis of consumer data, and the customization of content. Within the context of the digital 5.0 era, the purpose of this research is to investigate the influence that artificial intelligence (AI) has on the management of digital marketing for micro, small, and medium-sized businesses (MSMEs). The methodology used in this study is quantitative, and the kind of analysis utilized is associative. In all, 57 micro, small, and medium-sized enterprise (MSME) actors each received a questionnaire, and 32 of those surveys were returned and analyzed. With a significance value of 0.195 (which is more than 0.05) and an adjusted R² of 0.055, the findings of the regression study show that Artificial Intelligence does not have a significant effect on digital marketing among micro, small, and medium-sized enterprises (MSMEs) in Cilegon City. A greater degree of artificial intelligence adoption is seen among micro, small, and medium-sized enterprises (MSMEs) that are between 0 and 1 years old. For micro, small, and medium-sized enterprises (MSMEs) to fully exploit the potential of artificial intelligence in marketing initiatives, there is a need for enhanced digital literacy and technical assistance.

Keywords: Artificial Intelligence, Digital Marketing, MSMEs, Era 5.0, Cilegon City.

1 Introduction

The rapid development of technology has brought the world into the Era 5.0, where the boundaries between human life and technology are increasingly blurred. This era is marked by significant advancements in various technologies, especially Artificial Intelligence (AI), which plays a crucial role in many aspects of life, including digital marketing[1]. In this context, digital marketing management has undergone a massive transformation driven by the implementation of AI. Artificial intelligence in digital marketing offers various advantages, ranging from the ability to analyze large amounts of data to automating numerous marketing processes[1]. AI can provide in-depth analysis of consumer behavior, predict market trends, and offer more effective content personalization. All of this contributes to improved efficiency and effectiveness of marketing campaigns[2].

The application of AI in advertising helps optimize budgets better through targeted ads tailored to the needs and preferences of individual consumers. AI plays a key role in developing adaptive marketing strategies that can respond quickly and accurately to market

changes[3]. Although AI offers many benefits, its implementation in digital marketing is not without challenges. Issues such as data privacy, information security, and ethics in AI usage are major concerns. Nevertheless, although AI technology has rapidly advanced and offers significant potential in digital marketing, there is still limited clarity regarding its actual influence on digital marketing management among MSME actors, especially in the context of Cilegon City. The high implementation costs and the need for specialized expertise to manage this technology are also obstacles that need to be addressed[4].

According to <https://indonesiabaik.id/>, internet users in Indonesia have reached 73.7% of the total population, which presents opportunities for business digitalization development. The Ministry of Finance of the Republic of Indonesia recorded that 74.2% of respondents stated sales increased despite the COVID-19 pandemic. This success is inseparable from the role of implementing the right digital marketing strategies. Social media platforms can be an appropriate choice for MSMEs (Micro, Small, and Medium Enterprises) to introduce and promote their businesses to the public. Currently, there are many types of social media platforms such as Instagram, Facebook, TikTok, Twitter, YouTube, LinkedIn, and others. The first step that can be taken is to create a business social media account with a professional appearance[5].

Having a website not only makes it easier to market products or services digitally but also helps demonstrate the credibility and professionalism of the business[6]. Furthermore, to expand service reach, facilitate transactions, and increase revenue in building a quality website, it is important to consider features available on the website (e.g., purchasing features, information features, etc.), types of personal data collected such as internal company data and consumer data, website security levels, chosen hosting platforms, and website management resources whether sourced internally or outsourced. Currently, there is no need to worry because there are many types of platforms that provide instant websites to support business growth[7].

To understand this more clearly, we have written a guide article on how to create a website that can serve as a reference. Naturally, you want your website to be visited by many consumers. Essentially, your competitors also have similar websites with the same goal—to rank first on search engine pages, which can be achieved by using search engine optimization (SEO) strategies[8].

This research aims to explore the application of AI in digital marketing, identify its impact on marketing strategies, and evaluate the existing challenges and opportunities. With a deeper understanding of the role of AI in digital marketing, it is expected to provide valuable insights for MSME practitioners, marketers, and policymakers in designing more effective and sustainable marketing strategies in the Era 5.0[9]. While previous studies have generally explored the benefits and challenges of AI in digital marketing from a broad or global perspective, this study focuses specifically on how AI affects digital marketing management among MSMEs in Cilegon City. The localized scope of this research provides a unique contribution by examining AI implementation within the specific socio-economic and technological context of MSMEs in a developing city in Indonesia—an area that has received limited attention in prior literature. Artificial Intelligence (AI) is a branch used for facial recognition or spam detection. It is a subset of machine learning that uses artificial neural networks with multiple layers (deep learning) to analyze data and make decisions. This technology is applied in voice recognition, image recognition, and natural language processing[10]. AI that focuses on the interaction between computers and human language enables computers to understand, interpret, and respond to natural language. NLP applications include chatbots, sentiment analysis, and automatic translation[9]. AI that mimics the

decision-making ability of a human expert in a specific field is known as expert systems. These systems are used in medical diagnosis, financial planning, and legal advising[10]. AI has become an integral part of modern life, providing innovative solutions to various complex problems and advancing multiple sectors, including digital marketing. However, alongside its benefits, AI development also raises ethical, privacy, and security challenges that need to be carefully addressed[11]. The objective of this research is to understand how to reduce the time spent on routine marketing tasks such as email delivery, social media posting, and ad campaign management by using AI to analyze customer data and personalize marketing messages according to individual preferences and behaviors. By using chatbots and virtual assistants to provide fast and responsive customer service, analyzing big data from various social media sources and purchase histories to gain deeper insights into market trends and customer behavior, this approach can help MSMEs anticipate future consumer behavior and market needs.

2 Methods

Method is a way or technique carried out in the research process. Meanwhile, research is an effort to seek something conducted using certain methods, carefully, systematically, and thoroughly on a particular problem so that it can be answered. This research uses a quantitative empirical approach, which allows the recording of research data in the form of numbers. The type of research is associative analysis, which is a form of data analysis used to determine the relationship between two or more variables. Specifically, it examines the relationship between Artificial Intelligence and Digital Marketing Management, particularly in the city of Cilegon. Data were collected through questionnaires distributed to 57 MSME actors, with 32 responses returned and processed. In this study, the researcher used a probability sampling technique.

3 Results and Discussion

Based on the questionnaires collected from respondents, the following details regarding the questionnaire response rate were obtained. The validity test results for the 10 (ten) statement items on the human resource competency (HR competency) variable showed a p-value < 0.05, indicating that all statements in the HR competency variable are valid.

Table 1. Results of the Validity Test of Artificial Intelligence Variables

Variables (X)	Person Correlation	Sig	Information
Statement 1	0,749**	0,00	Valid
Statement 2	0,808**	0,00	Valid
Statement 3	0,673**	0,00	Valid
Statement 4	0,794**	0,00	Valid
Statement 5	0,729**	0,00	Valid
Statement 6	0,700**	0,00	Valid
Statement 7	0,855**	0,00	Valid
Statement 8	0,527**	0,00	Valid

Statement 9	0,702**	0,00	Valid
Statement 10	0,579**	0,00	Valid

The validity test results shown in table 1, for the 7 (seven) statement items on the Digital Marketing in Sales Management variable also showed a p-value < 0.05 , meaning all statements in the Digital Marketing in Sales Management variable are valid. The reliability test was used to measure the questionnaire's consistency, and the questionnaire is considered reliable if it has a Cronbach's Alpha value > 0.75 .

Based on the reliability test results in Table 5 above, it can be concluded that the statements measuring the variables Artificial Intelligence, Digital Marketing, and Advertisement Optimization are reliable (trustworthy) as they have met the minimum required criteria.

The reliability test results showed that Artificial Intelligence and Digital Marketing did not have a significant level of < 0.05 , and the t coefficient value was 1.327, indicating a negative relationship (-). This means that Artificial Intelligence does not have an effect on Digital Marketing. Table 5 shows an R-squared value of 0.05, meaning that the independent variable explains 5% of the dependent variable, while 95% is explained by variables not examined or included in this regression model.

The simple regression test results showed a significance value of 0.195, which means there is no significant effect. This suggests that UMKM (Micro, Small, and Medium Enterprises) actors in Cilegon City have not maximally utilized Artificial Intelligence (AI). It is shown that UMKM actors who have been active for 5 to 10 years are the ones using AI, while those who have been active for 0 to 1 year have already massively adopted AI, understand AI, keep up with digital developments, and have conducted UMKM marketing digitally.

These findings are consistent with research by [12] Tumbel & Loindong (2024) on the impact of artificial intelligence and e-service quality on purchase intention for the Netflix application among Generation Z in North Sulawesi. AI is capable of collecting data from various sources such as social media, websites, and online transactions [12].

4 Conclusion

The research findings prove that AI enhances the ability to collect, analyze, and process large amounts of data. Digital marketing offers a broad and diverse platform to reach a wider audience in a more measurable and targeted way.

Out of a total of 57 questionnaires distributed to UMKM (Micro, Small, and Medium Enterprises) actors in Cilegon City, 32 questionnaires (56%) were successfully returned and all were processed. This indicates a fairly good level of respondent participation in supporting this research. The majority of respondents were female (78%), and most had been operating their businesses for between 1 and 10 years. This shows that most UMKM in Cilegon City are run by women and are in the growth stage of their business.

All questionnaire items related to the Artificial Intelligence and Digital Marketing variables were declared valid as they had significance values below 0.05. In addition, the reliability test results showed that both variables had Cronbach's Alpha values above 0.75, indicating that the research instruments are reliable and appropriate for use.

Based on the regression test results, it was found that the Artificial Intelligence variable does not have a significant effect on Digital Marketing for UMKM in Cilegon City. This is shown by a significance value of 0.195 (> 0.05) and an Adjusted R Square value of 0.055,

meaning AI contributes only 5% in explaining the digital marketing variable, while the remaining 95% is explained by other variables not examined in this study.

UMKM that have been established for 0–1 year tend to be more active in utilizing artificial intelligence technology compared to those that have been operating longer. This indicates that adaptation to new technology occurs more quickly among newer generation business actors who are more open to digital developments.

This study shows that although artificial intelligence technology has great potential, its utilization by UMKM in Cilegon City is still suboptimal. Therefore, education and guidance are necessary to help UMKM actors maximize the use of digital technology in their marketing strategies.

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