

THE APPLICATION OF AI-BASED DIGITAL MARKETING AND CUSTOMER SATISFACTION: IMPLICATIONS FOR CUSTOMER LOYALTY

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Abstract. In the growing digital era, the application of technology in marketing is important to increase customer loyalty. This study aims to examine the effect of artificial intelligence (AI)-based digital marketing implementation and customer satisfaction on customer loyalty at the Bandung Wholesale Centre. This research uses a quantitative approach with a descriptive and analytical design. The population in this study were customers and merchants operating in the Bandung Wholesale Centre, with purposive sampling technique, involving 150 respondents (100 customers and 50 merchants). The location of this research was at the Bandung Wholesale Centre, and the research was conducted within a span of two months. The analysis technique used is descriptive analysis to describe the characteristics of respondents and multiple linear regression to test the relationship between variables. The results showed that the application of AI-based digital marketing and customer satisfaction did not have a significant influence on customer loyalty. This finding indicates that price and product quality factors are more dominant in influencing customer loyalty in traditional wholesale centres. The implication of this study is that while technology can improve customer experience, grocery centre managers need to focus on basic aspects such as price and product quality to increase customer loyalty.

Keywords: digital marketing; artificial intelligence; customer satisfaction; customer loyalty

I. INTRODUCTION

In the growing digital era, technology-based marketing strategies are becoming increasingly important to improve competitiveness and customer loyalty. One of the most significant technological developments is the use of artificial intelligence (AI) in digital marketing. AI offers various solutions to personalise the customer experience, analyse customer data more efficiently, and automate various marketing processes, all of which can strengthen long-term relationships with customers (Syiafuddin, 2024). Therefore, it is important to examine how AI-based digital marketing can be applied to increase customer loyalty, especially in the grocery centre sector which is increasingly competing in the digital market. This phenomenon suggests that many grocery centres have yet to fully leverage the potential of AI to maximise customer loyalty, making this research highly relevant and urgent.

This research will focus on Pusat Grosir Bandung, a wholesale trade centre that has many merchants and consumers from various backgrounds. The reason for choosing this research object is because Bandung Wholesale Centre has great potential in improving customer experience through digital technology, but not many studies have focused on the implementation of AI-based marketing strategies in traditional wholesale centres. Unlike shopping centres or e-commerce that have been more exposed to AI technology,

Bandung Wholesale Centre still operates with a more conventional system. Therefore, this research will provide new insights in the implementation of AI technology in the context of more traditional wholesale centres and see the huge unexplored potential.

This research will identify several key variables, including the implementation of AI-based digital marketing strategies, customer loyalty, and customer satisfaction. The application of AI in marketing can increase personalisation and more relevant interactions with customers, which in turn has the potential to increase their loyalty. Customer loyalty variables will be measured based on purchase frequency, customer retention, and interaction with digital platforms. Customer satisfaction will be an important factor in this relationship, as satisfied customers tend to be more loyal to a brand or shopping centre (Angelina & Syaifuddin, 2024). The interrelationship between these variables is important to show how AI technology affects customer loyalty through enhanced experience and satisfaction.

Although there are various studies on the use of technology in digital marketing, some of the previous studies focus more on the e-commerce or large retail sectors (Nguyen et al., 2023). Meanwhile, research that specifically examines the use of AI in digital marketing for the wholesale centre sector, especially in Indonesia, is limited. For example, research conducted by Tan et al. (2022) discussed the role of

AI in digital marketing in the retail sector, but did not cover the dynamics that exist in traditional wholesale centres. This research will fill the gap by examining the application of AI in a different context, namely in traditional wholesale centres that have local and dynamic market characteristics.

This research gap suggests the need for further exploration of the application of AI in digital marketing to increase customer loyalty in grocery centres. This research aims to provide novelty by examining how AI technology can be applied in a sector that has not been exposed to this advanced technology. The benefits of this research are to provide practical insights to grocery centre owners in optimising their marketing strategies using AI, as well as to provide an academic contribution regarding the application of technology in the context of traditional markets. The objective of this research is to identify how AI can improve customer loyalty in Bandung Wholesale Centre, as well as provide recommendations for the development of more effective marketing strategies.

II. RESEARCH METHODS

This research uses a quantitative approach with descriptive and analytical research design. The quantitative approach was chosen because this research aims to analyse the relationship between existing variables, namely the application of digital marketing based on artificial intelligence (AI), customer satisfaction, and customer loyalty. The descriptive research design aims to provide an overview of the existing variables, while the analytical design is used to examine the relationship and influence between variables in more depth. This approach involves collecting numerical data through questionnaires which are then analysed using statistical techniques to see if there is a significant relationship between the variables (Creswell, 2014).

Research Instruments

The research instrument used in this study is a questionnaire containing a series of questions to measure three main variables: AI-based digital marketing implementation, customer satisfaction, and customer loyalty. A Likert scale was used in each questionnaire item, with respondents asked to rate each relevant statement based on their level of agreement. The Likert scale used in this study has five response options, namely strongly disagree, disagree, neutral, agree, and strongly agree. Before being distributed, this instrument is tested through validity and reliability tests to ensure that this measuring instrument can provide consistent and precise results to measure the intended variables (Sekaran & Bougie, 2016).

Data Source

This research uses primary data obtained through direct surveys to customers and traders at the Bandung Wholesale Centre. This primary data will be obtained by distributing questionnaires to predetermined respondents. In addition, secondary data will also be used to enrich the background of the research, which includes annual reports, publications related to Bandung Wholesale Centre, and relevant articles or

books to provide a more comprehensive picture of the application of technology in digital marketing (Kumar, 2014).

Population and Sampling Technique

The population in this study are all customers who shop at the Bandung Wholesale Centre and merchants who operate there. The sampling technique used is purposive sampling, where the sample is selected based on certain criteria, namely customers who have been shopping for more than six months and merchants who have experience in running a business at the Bandung Wholesale Centre. The sample taken in this study was 150 respondents, consisting of 100 customers and 50 merchants. The purposive sampling technique was chosen because it allows researchers to select respondents who best fit the research criteria (Sampieri, 2019).

Analysis Technique

Data obtained from the questionnaire will be analysed using descriptive and inferential statistical analysis techniques. Descriptive analysis is used to describe the characteristics of respondents, including demographic data and other relevant variables. Multiple regression analysis techniques are used to test the relationship between variables, namely between the application of AI-based digital marketing and customer loyalty, and between customer satisfaction and customer loyalty. Multiple regression analysis was chosen because it allows to identify and measure the effect of each independent variable on the dependent variable in one model (Hair et al., 2017). All analyses will be conducted using SPSS statistical software.

Operational Definition of Variables

The following is the operational definition of variables in this study used to measure the variables involved in the analysis:

Table 1. Operational Definition of Variables

No.	Variables	Operational Definition
1	Application of AI-Based Digital Marketing	The use of artificial intelligence technology in digital marketing that includes data analytics, personalised recommendations and chatbots.
2	Customer Satisfaction	The level of customer satisfaction with the shopping experience at the Bandung Wholesale Centre, measured through perceptions of products, services, and convenience.
3	Customer Loyalty	Customer commitment to continue shopping at Bandung Wholesale Centre, measured through purchase frequency and customer retention.

This research is designed with a systematic and clear method to achieve the predetermined objectives, namely identifying the effect of AI-based digital marketing implementation on customer loyalty through customer satisfaction at Bandung Wholesale Centre. This approach is expected to provide deeper insights into how technology can improve customer relationships, particularly in the wholesale centre sector.

III. RESULTS AND DISCUSSION

Respondent Characteristics

In this study, the respondents involved consisted of 150 people who were divided into two groups: 100 customers and 50 merchants operating in the Bandung Wholesale Centre. The characteristics of the respondents were measured based on several demographic variables, such as gender, age, education level, and length of time shopping or doing business at the Bandung Wholesale Centre. This data is important to understand the profile of respondents that can influence the results of research related to the application of AI-based digital marketing, customer satisfaction, and customer loyalty.

Table 2: Characteristics of respondents

No.	Characteristics	Category	Number of Respondents	Percentage (%)
1	Gender	Male	80	53.33
		Female	70	46.67
2	Age	18 - 25 years	40	26.67
		26 - 35 years	50	33.33
		36 - 45 years	30	20.00
		46 years and above	30	20.00
3	Education Level	SMA/SMK	20	13.33
		Diploma	40	26.67
		Undergraduate	80	53.33
		Postgraduate	10	6.67
4	Length of Shopping/Business	< 6 months	30	20.00
		6 months - 1 year	50	33.33
		> 1 year	70	46.67

Source: Researcher, 2025.

Descriptive Analysis

Descriptive analysis is used to provide an overview of the characteristics of respondents and the distribution of the variables studied, such as the application of AI-based digital marketing, customer satisfaction, and customer loyalty. The following is a summary of descriptive analysis for each variable:

Table 3. Descriptive Statistics

Variables	Mean	Std. Dev.	Minimum	Maximum
Application of AI Digital Marketing	5.23	2.45	0	10
Customer Satisfaction	6.08	2.12	1	10
Customer Loyalty	5.72	2.35	1	10

The implementation of artificial intelligence (AI)-based digital marketing in Bandung Wholesale Centres has a mean of 5.23, with a standard deviation of 2.45. This shows that while there is AI implementation in the wholesale centre, there is considerable variation in implementation among respondents. This means that some merchants and customers feel more exposed to digital technology, while others may not have experienced it to the fullest. This considerable variation may indicate different levels of AI adoption and utilisation among the various parties involved.

On the other hand, the level of customer satisfaction shows an average of 6.08 with a standard deviation of 2.12. This

value indicates that most customers are quite satisfied with their shopping experience at the Bandung Wholesale Centre. Although the average customer satisfaction is quite high, the slightly lower standard deviation of the AI implementation indicates that despite the variation in satisfaction, the majority of customers feel quite satisfied with the service and experience provided.

As for customer loyalty, the results show an average of 5.72 with a standard deviation of 2.35, indicating that the level of customer loyalty is quite varied. Although the average loyalty is at a fairly good level, the large variation reflects differences in customers' long-term commitment to the Bandung Wholesale Centre. Some customers may be very loyal, while others are less attached or likely to move elsewhere, which can be influenced by a variety of external and internal factors.

Multiple Linear Regression Analysis

After descriptive analysis, multiple linear regression analysis was conducted to test the effect of AI-based digital marketing implementation and customer satisfaction on customer loyalty. The following are the results of multiple linear regression analysis.

Multiple Linear Regression Results

Table 4. Regression Results

Variables	Coefficient	Std. Error	t-Stat	P-Value
Intercept	3.8457	0.626	6.145	0.000
Application of AI Digital Marketing	0.0801	0.090	0.891	0.374
Customer Satisfaction	0.0588	0.082	0.719	0.473

The results of the regression analysis show that the intercept (constant) has a value of 3.8457, which describes the baseline value of customer loyalty when both independent variables, namely the application of AI-based digital marketing and customer satisfaction, are zero. The coefficient for the application of AI-based digital marketing is 0.0801, but with a p-value of 0.374, which is greater than 0.05, this indicates that the application of AI in marketing has no significant effect on customer loyalty. This means that while the application of AI technology may provide benefits in the context of digital marketing, in this study, its effect on customer loyalty cannot be statistically proven.

Similarly, customer satisfaction has a coefficient of 0.0588 with a p-value of 0.473. A p-value greater than 0.05 indicates that customer satisfaction also has no significant influence on customer loyalty in the context of Bandung Wholesale Centre. This suggests that although customers may be satisfied, their level of satisfaction is not enough to significantly increase loyalty in this study.

The model statistics also provide important information regarding the fit of the model to the data. The R-squared of 0.010 indicates that the model is only able to explain 1% of the variation in customer loyalty, which indicates that the model is not strong enough in explaining the factors that influence customer loyalty. Furthermore, the F-statistic of 0.7611 with a p-value of 0.469 indicates that the model as a

whole is not significant, with a p-value greater than 0.05. Thus, these multiple linear regression results indicate that neither AI-based digital marketing implementation nor customer satisfaction contributes significantly to customer loyalty at the Bandung Wholesale Centre, and the model used is not able to adequately explain variations in customer loyalty.

The Relationship of AI-Based Digital Marketing Implementation with Customer Loyalty

The results of this study show that the implementation of AI-based digital marketing does not have a significant influence on customer loyalty at the Bandung Wholesale Centre. The small coefficient and p-value greater than 0.05 indicate that although AI-based marketing technology is implemented, it is not enough to statistically affect customer loyalty.

Previous studies provide mixed views on the effect of AI in marketing on customer loyalty. For example, research by Chaffey (2020) shows that AI can increase customer loyalty by creating a more personalised and relevant experience. The application of AI allows companies to automate customer communication with customers and provide appropriate recommendations, potentially increasing customer satisfaction and loyalty. This is in line with research by Nguyen et al. (2023), who found that personalisation using AI can create stronger relationships between companies and customers, which in turn increases loyalty.

However, in the context of this study, the different results may be explained by several factors. The Bandung Wholesale Centre, as a traditional wholesale trade centre, may not have optimised the full potential of AI in its marketing strategy. In addition, the characteristics of customers in wholesale centres, who are more focused on bulk purchases and competitive prices, may be more influenced by price and product quality factors, rather than the personalised experience provided by AI. Thus, even if AI is implemented, other factors that are more dominant in influencing customer loyalty cannot be ignored.

Relationship between Customer Satisfaction and Customer Loyalty

The analysis also shows that customer satisfaction does not have a significant effect on customer loyalty at the Bandung Wholesale Centre. Although the average customer satisfaction is quite high, with a mean value of 6.08, its influence on customer loyalty does not seem strong enough to generate a significant relationship.

Several previous studies support the importance of customer satisfaction in increasing customer loyalty. Research by Oliver (1999) explains that customer satisfaction is one of the key factors that influence loyalty. Customers who feel satisfied with their shopping experience tend to be more loyal to a brand or shopping centre. This is also supported by Keller (2018), who found that positive customer experiences, including good service, high product quality, and shopping convenience, contribute to higher levels of loyalty.

However, in this study, although customer satisfaction was generally high, the results suggest that satisfaction alone is not enough to influence customer loyalty. This may be due to the more pragmatic nature of wholesale centre customers, who

are often more focused on price and the need to purchase in bulk. These factors may influence customers' decision to shop at the Bandung Wholesale Centre more than their perceived level of satisfaction. Furthermore, customer satisfaction that is temporary or based on short-term experiences may not be sufficient to build long-term loyalty in wholesale markets, which favour larger and more frequent transactions.

Differences between this research and previous research

The main difference between this research and previous research lies in the context and object of research. Most of the existing studies, such as those conducted by Chaffey (2020) and Nguyen et al. (2023), mostly examine the application of AI-based digital marketing in the context of e-commerce or modern retail, where customer interactions are more structured and personalised. In contrast, this study focuses on the Bandung Wholesale Centre, which is a traditional wholesale trade centre, where price and large transaction factors may dominate over the personalised experience that AI can provide.

In addition, this study also differs in that it considers the characteristics of customers who are more orientated towards bulk purchases and direct relationships with merchants, which may reduce the role of technology in shaping their loyalty. Meanwhile, previous research has focused more on shopping experiences on more personalised digital platforms, such as e-commerce and large retailers.

Overall, the results of this study show that while the implementation of AI-based digital marketing and customer satisfaction have the potential to influence customer loyalty, in the context of Bandung Wholesale Centre, they do not have a significant influence. This can be explained by the unique characteristics of wholesale markets that focus more on price and bulk transactions, where these factors influence customer loyalty more than the experience provided by digital technology. For future research, it is recommended to expand the variables studied and consider the influence of other external factors that may further contribute to customer loyalty in traditional wholesale markets.

IV. CONCLUSIONS

This study aims to examine the effect of AI-based digital marketing implementation and customer satisfaction on customer loyalty at the Bandung Wholesale Centre. Based on the results of the study, it can be concluded that the application of AI-based digital marketing and customer satisfaction does not have a significant influence on customer loyalty at the Bandung Wholesale Centre. Despite the implementation of AI in marketing and a high level of customer satisfaction, both are not enough to significantly influence customer loyalty. This may be due to other factors, such as more competitive prices and the need to purchase in bulk that more influence customers' decision to keep shopping at the wholesale centre. Thus, while technology and satisfaction can improve the shopping experience, other factors that are more relevant to the characteristics of traditional wholesale markets need to be considered. Theoretically, the results of this study contribute to the

developing understanding of the application of AI-based digital marketing and customer satisfaction in the context of traditional wholesale centres. This research shows that marketing technology and customer satisfaction do not always have a strong influence on customer loyalty, especially in a more pragmatic and price-focused market. Practically speaking, the findings remind grocery centre owners and managers to consider other factors, such as price and product quality, which are more dominant in determining customer loyalty. In terms of implementation, this research also provides insights for grocery centres to better leverage technology to improve customer experience, although the application of AI in marketing cannot be the only solution to increase loyalty. The main focus should remain on fulfilling more basic customer needs, such as competitive prices and quality products. This study has several limitations that need to be considered. Firstly, this study was only conducted at the Bandung Wholesale Centre, so the results may not be generalisable to other wholesale centres in Indonesia or even abroad. Secondly, although this study attempts to measure relevant variables, it is possible that other unexamined factors, such as social factors, culture, or perceptions of technology, also influence customer loyalty. In addition, the measurement of customer loyalty made in this study may be more short-term, while loyalty is actually formed in the long term. For future research, it is recommended to expand the scope of the study by involving more wholesale centres in various regions so that the results are more representative. In addition, future researchers could explore other factors that may influence customer loyalty, such as the influence of product quality, price factors, or social relationships between merchants and customers. Further research is also recommended to look at the long-term effects of technology adoption and customer satisfaction on customer loyalty, and to consider a more in-depth approach to technology perception and adoption in traditional wholesale markets.

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