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Research Paper

Loyalty: The Use of Chatbots and Social Media Marketing with User Satisfaction as a Mediating Variable

Aida Fitri[1], Muhammad Jaka Wiratama[1], Daffa Azka[1], Harbiyah G[2]

[1]Faculty of Economics, Universitas Muhammadiyah Aceh, Banda Aceh 23123, Indonesia
[2]Faculty of Vocational Studies, Universitas Muhammadiyah Aceh, Banda Aceh 23123, Indonesia

aida.fitri@unmuha.ac.id

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Abstract

Chatbots and social media marketing (SMM) have emerged as two primary tools utilized by companies to enhance customer experience and foster customer loyalty. The objective of this quantitative study is to examine the influence of chatbot usage and social media marketing on customer loyalty, with user satisfaction serving as a mediating variable. A total of 96 respondents from the city of Banda Aceh participated in the survey, selected using a random sampling technique based on individuals actively engaged in business activities. Data were collected through questionnaires and documentation review. Hypothesis testing was conducted using multiple linear regression analysis, including both F-tests (simultaneous) and t-tests (partial), at a 95% confidence level ($\alpha = 0.05$). The findings indicate that chatbots have a strong influence on customer loyalty, and social media marketing demonstrates a close relationship with customer loyalty. Furthermore, user satisfaction significantly mediates the relationship between these digital tools and loyalty. The implication of this research is that the integration of chatbots and social media marketing, mediated by user satisfaction, significantly influences customer loyalty.

Keywords: Chatbot usage; Social media marketing; User satisfaction; Customer loyalty

1. Introduction

The advancement of digital technology has transformed the way businesses interact with consumers. In the digital era, chatbots and social media marketing (SMM) have emerged as two primary tools used by companies to enhance customer experience and foster loyalty. Chatbots, as a representation of artificial intelligence (AI), enable fast and personalized interactions with users, while social media marketing leverages social media platforms to reach a broader audience. These two tools not only facilitate communication between brands and consumers but

also play a significant role in shaping user satisfaction, which ultimately influences customer loyalty [1].

Customer loyalty is a key factor in the long-term success of a business. Loyal customers tend to make repeat purchases, recommend the brand to others, and are less sensitive to price changes. However, building customer loyalty in the digital era is not an easy task. Today's consumers have access to vast amounts of information and can easily switch to other brands if their experience is unsatisfactory. Therefore, companies need to understand the factors that can enhance customer loyalty, particularly in the context of technology adoption such as chatbots and social media marketing [2].

Chatbots have become a popular solution for companies to enhance the efficiency of customer service. With the ability to provide instant responses and operate 24/7, chatbots can meet the needs of consumers who demand convenience and speed in interactions. In addition, chatbots can be personalized according to user preferences, thereby creating a more relevant and satisfying experience. However, the effectiveness of chatbots in building customer loyalty still requires further investigation, particularly in relation to user satisfaction as a mediating variable [3]. On the other hand, social media marketing has become a key strategy for companies to build relationships with consumers. Social media enables brands to interact directly with audiences, share engaging content, and obtain real-time feedback. Through social media marketing, companies can create loyal communities that are actively engaged with the brand. However, the main challenge in social media marketing lies in maintaining consistency and relevance of content to meet user expectations [4].

User satisfaction serves as a critical factor in the relationship between chatbot usage, social media marketing, and customer loyalty. User satisfaction can be defined as the level of pleasure or disappointment experienced by consumers after comparing the performance of a product or service with their expectations. When users are satisfied with their interactions through chatbots or with the content presented via social media marketing, they are more likely to develop stronger emotional bonds with the brand, which in turn can enhance loyalty [5]. Chatbot systems are designed to provide responses to users based on the questions posed. A chatbot is capable of generating replies by adapting to the words contained in its training phrases [6]. To address the challenges mentioned above, innovation is required to minimize the role of human administrators by employing automatic chat systems, commonly known as chatbots. With the implementation of chatbots, a website can remain active around the clock without concerns about customers' inquiries regarding the products offered, since responses are automatically provided by the programmed chatbot integrated into the website.

Several previous studies have revealed the relationship between the use of digital technology and customer loyalty. However, there remains a research gap that needs to be explored, particularly in the context of the simultaneous use of chatbots and social media marketing. Moreover, the role of user satisfaction as a mediating variable in this relationship has not been extensively examined. Therefore, this study aims to fill this gap by analyzing how the use of chatbots and social media marketing can influence customer loyalty through user satisfaction [7].

This research is also grounded in current industry phenomena, where many companies have begun adopting chatbots and social media marketing as part of their marketing strategies. However, not all companies have succeeded in utilizing these tools optimally. Some face challenges in integrating chatbots with their social media marketing strategies, while others struggle to ensure that interactions through chatbots and social media content meet user expectations. Hence, this study is expected to provide valuable insights for companies in optimizing the use of chatbots and social media marketing to enhance customer loyalty [8].

In addition, this study is also relevant to the growing consumer trend of seeking personalized and instant experiences. Today's consumers are not only looking for quality products or services but also expect interactions that are simple, fast, and tailored to their needs. Chatbots and social media marketing can serve as solutions to meet these expectations, provided that they are implemented with the right strategies. By understanding how these two tools can influence user satisfaction and customer loyalty, companies can design more effective strategies to gain a competitive advantage in the digital marketplace **[9]**.

From a theoretical perspective, this study is expected to contribute to the development of literature on customer loyalty, particularly in the context of digital technology adoption. The findings of this research may enrich the understanding of how chatbots and social media marketing can interact to create a satisfying customer experience, which ultimately enhances loyalty. Furthermore, this study can also serve as a reference for other researchers interested in exploring similar topics in the future. Practically, this study is expected to provide recommendations for companies in optimizing the use of chatbots and social media marketing. By understanding the factors that influence user satisfaction and customer loyalty, companies can design more targeted and effective strategies. For example, firms may integrate chatbots with social media platforms to create more seamless interactions or develop more personalized and relevant content to enhance user satisfaction.

Based on the above discussion, this research is urgent to conduct to better understand the dynamics between chatbot usage, social media marketing, user satisfaction, and customer loyalty. Thus, this study is expected to contribute both theoretically and practically within the context of digital marketing and customer relationship management. The research will be conducted through the distribution of questionnaires to respondents. The title of this study is loyalty: the use of chatbots and social media marketing with user satisfaction as a mediating variable.

2. Method

2.1 Research location and object

This study was conducted in Banda Aceh. The research objects are Artificial Intelligence (AI) applications and business strategies utilizing AI technology in Banda Aceh.

2.2 Research design

The research design begins with identifying quantitative problems and formulating them into research questions. The problems are then addressed using relevant theories. According to **[10]**, research design is a process of finding definite answers to research questions. Similarly, **[11]** defines research design as all processes required in the planning and implementation of research.

2.3 Population

Population refers to the entire group of individuals, events, or objects that form the focus of research and are to be investigated **[12]**. In this study, the population consists of all respondents who use AI-based technologies, with an unknown (infinite) number.

2.4 Sample

According to **[11]**, a sample is a subset of the population that possesses the characteristics being studied. The respondents in this study were determined using an infinite population formula:

$$n = \frac{Z^2}{4(Moe)^2}$$

Where:
Z = Normal distribution level at a 5% significance level = 1.96
n = Sample size
Moe = Margin of error, with a maximum error rate of 10%

$$n = \frac{(1.96)^2}{4\ (0{,}10)^2}$$

$$n = \frac{3.8416}{0.04}$$

$$n = 96.04$$
$$n = 96$$

Based on the formula, the sample size for this study is 96 respondents, consisting of individuals who use chatbots and social media marketing in Banda Aceh. The sampling technique applied is Accidental Sampling. [11] defines accidental sampling as selecting respondents by coincidence, i.e., anyone who happens to meet the researcher and meets the criteria as a data source can be used as a respondent. This technique is often chosen due to time, resource, and budget constraints. Its strength lies in the researcher's ability to select appropriate data sources that align with the research variables.

2.5 Data analysis techniques

According to [13], data analysis in this study was conducted using the SPSS program (Statistical Package for the Social Sciences). The techniques included validity testing, reliability testing, descriptive analysis, normality testing, linearity testing, and classical assumption tests. To assess relationships among variables, multiple regression analysis was employed, including the calculation of the coefficient of determination, t-tests, and F-tests. The regression model used in this study is formulated as follows:

Y= a + b1X1 + b2X2 + e……. (1)

Where:
Y = Loyalty
a = Constant
X1 = Chatbot Users
X2 = Social Media Marketing
M = User Satisfaction
B = Regression coefficients of X_1, X_2
e = Error term

2.6 Moderated regression analysis (MRA)

Moderated Regression Analysis (MRA) is employed to maintain the integrity of the sample and to control the effect of moderating variables [14]. A moderating variable is an independent variable that strengthens or weakens the relationship between an independent and a dependent variable. In this study, the moderating variable is user satisfaction. The independent variables are chatbot usage and social media marketing, while the dependent variable is customer loyalty.

Thus, the study examines the interaction between chatbot usage, social media marketing, and user satisfaction in relation to loyalty. The regression equation can be expressed as

$$\mathbf{Y = \alpha + \beta 1ZX1 + \beta 2ZX2 + \beta 3ZM + \beta 4|ZX1\text{-}ZM| + \beta 5|ZX2 - ZM| + e} \ldots\ldots\ldots\ldots (2)$$

Y	= Loyalty
ZX	= Standardized value of Chatbot Usage
ZX2	= Standardized value of Social Media Marketing
ZM	= User Satisfactio
|ZX1−ZM|	= Interaction measured by the absolute difference between ZX1 and ZM
|ZX2−ZM|	= Interaction measured by the absolute difference between ZX2 and ZM
α\alpha$\alpha$	= Constant
β\beta$\beta$	= Regression Coefficient
e	= Error Term

2.7 Data testing

Validity testing was conducted to ensure that the instrument accurately measured the intended variables under study. The validity of each item was assessed using the Pearson Product-Moment Correlation at a 95% confidence level **[15]**. Reliability testing was performed to assess the internal consistency of the instrument by examining item-total correlations. Items with correlation values above 0.20 were considered reliable and retained for further analysis **[16]**.

2.8 Classical assumption tests

The normality test was conducted to determine whether the data followed a normal distribution, with data considered normally distributed if the probability value exceeded 0.05. The multicollinearity test was performed to detect correlations among independent variables, as a good regression model should be free from multicollinearity to ensure that independent variables are not highly correlated with one another. Additionally, the heteroscedasticity test was conducted to examine whether residual variance remained constant across observations, where homoscedasticity indicates equal variance across observations, while heteroscedasticity suggests unequal variance that can affect the reliability of regression estimates **[14]**.

2.9 Hypothesis testing

The t-test was used to evaluate the partial significance of each independent variable, specifically chatbot usage and social media marketing, on customer loyalty. Meanwhile, the F-test was employed to assess the simultaneous significance of all independent variables on the dependent variable, determining whether the model as a whole had a significant effect on customer loyalty **[15]**.

3. Result

3.1 Validity test results

The validity of the data was tested statistically using the Pearson Product-Moment Correlation through SPSS. All items obtained correlation values above the critical value of 0.202 (α = 5%), which indicates that the items are significant and valid. Statistically, this demonstrates internal consistency, meaning that the items measure the same construct. As shown in **Table 1** below:

Table 1. Validity tes result

Variable	Loyalty: chatbots and social media marketing users and satisfaction as mediating variables		Value r_{tabel} (n = 96)	Description
	Item	(r_{hitung})		
Loyality (Y)	A1	0.779	0.194	Valid
	A2	0.780		
	A3	0.790		
	A4	0.793		
	A5	0.715		
Chatbot users (X_1)	B1	0.658	0.194	Valid
	B2	0.831		
	B3	0.733		
	B4	0.738		
	B5	0.369		
Social media marketing (X_2)	C1	0.693	0.194	Valid
	C2	0.739		
	C3	0.703		
	C4	0.285		
	C5	0.782		
User satisfaction (M)	D1	0.760	0.194	Valid
	D2	0.392		
	D3	0.844		
	D4	0.629		
	D5	0.844		

3.2 Reliability test results

Reliability testing was performed using internal consistency (Cronbach's Alpha). Create a Discussion A Cronbach's Alpha value greater than 0.60 is considered acceptable, while values above 0.80 indicate high reliability. All research variables exceeded 0.80, confirming that the instruments were reliable. Reliability testing was performed using internal consistency (Cronbach's Alpha). The results are presented in **Table 2**:

Table 2. Reliability test results

No.	Name	Alpha value	Category
1	Loyalty (Y)	0.903	Reliable
2	Pengguna chatbots (X_1)	0.844	Reliable
3	Social media marketing (X_2)	0.829	Reliable
4	User satisfaction (M)	0.863	Reliable

3.3 Normality test results

Normality testing was conducted using regression analysis with SPSS. As illustrated in **Figure 1**, the scatterplot results indicated that data points were distributed around the diagonal line, suggesting that the data were normally distributed.

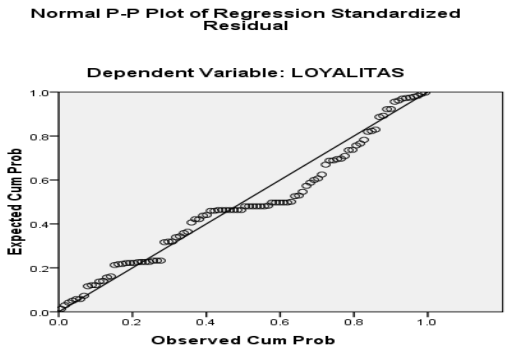

Figure 1. Normal P-P plot of regression standardized residual

3.4 Multicollinearity test results

The multicollinearity test aimed to determine whether high correlations existed among independent variables. Tolerance values greater than 0.10 and VIF values below 10 indicate the absence of multicollinearity. The results indicate that no independent variable had a tolerance value below 0.10 or a VIF value above 10, confirming that multicollinearity was absent.

Table 3. Multicollinearity test results

No.	Name	Toleran	VIF	Category
1	Chatbot users (X_1)	0,216	2.635	Non multikolinearitas
2	Social media marketing (X_2)	0,402	2.486	Non multikolinearitas
3	User satisfaction (M)	0,270	2.882	Non multikolinearitas

As presented in **Table 3**, none of the independent variables exhibits a Tolerance value below 0.10, indicating that there is no significant correlation among the independent variables. Similarly, the results of the Variance Inflation Factor (VIF) analysis confirm that all independent variables have VIF values below the threshold of 10. Accordingly, it can be concluded that the regression model employed in this study does not suffer from multicollinearity.

3.5 Hypothesis testing

The hypothesis states that Chatbot Usage (X1), Social Media Marketing (X2), and User Satisfaction (X3) as a mediating variable (M) have an influence on loyalty. The model employed to estimate this effect is as follows:

Table 4. The influence of independent variable on the dependent variable

No.	Name	β	Standar eror	T_{hiting}	T_{hiting}	Sig
1	Constanta	0.334	0.084	0.347	3.977	0.000
2	Chatbots	0.587	0.092	0.547	6.365	0.000
3	Media sosial marketing	0.433	0.166	0.031	2.673	0.002
4	User satisfaction	0.391	0.100	0.379	3.913	0.000

3.6 Partial test (t-Test)

Partial testing was conducted to determine the effect of each independent variable on loyalty in Banda Aceh. The results show that all three independent variables—Chatbot Usage, Social Media Marketing, and User Satisfaction—significantly influence customer loyalty in Banda Aceh.

3.7 Simultaneous test (F-Test)

To examine the influence of chatbot usage, social media marketing, and user satisfaction on loyalty in Banda Aceh, the F-test (statistical F-test) was employed. If the calculated F-value (F_{calculated}) is greater than the critical F-value (F_{table}), the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted. Conversely, if F_{calculated} is less than F_{table}, the null hypothesis is accepted and the alternative hypothesis is rejected. The partial test results are presented in the following table:

Table 5. Anova

No.	Model	Sum of Squeres	Df	F_{hiting}	F_{hiting}	Sig
1	Regression	41.993	3	178.456	.000[a]	41.993
2	Residual	7.216	92			7.216
3	Total	49.210	95			49.210

4. Discussion

4.1 The effect of chatbot usage on customer loyalty

The findings indicate that chatbot usage significantly influences customer loyalty. The regression coefficient for chatbot usage was 0.587 with a significance level of 0.000, suggesting a strong effect. Furthermore, the t-value (6.365) exceeded the critical t-table value (1.986), supporting the hypothesis. This implies that chatbots play a crucial role in enhancing customer interactions through rapid and responsive communication, which directly increases loyalty. Moreover, user satisfaction strengthens the relationship, highlighting its mediating role. These results align with **[17]**, who found that chatbots improve customer satisfaction and trust, which ultimately foster loyalty.

4.2 The effect of social media marketing on customer loyalty

Social media marketing was also found to have a significant positive effect on loyalty. The regression coefficient was 0.433, with a significance level of 0.002 and a t-value of 2.673, exceeding the t-table value. This demonstrates that effective social media marketing strategies enhance customer loyalty by fostering interaction, personalization, and emotional engagement with brands. These findings are consistent with **[18]**, who emphasized that interactive, consistent, and relevant social media content boosts customer trust and loyalty.

4.3 The effect of user satisfaction on customer loyalty

User satisfaction strongly influenced customer loyalty, with a regression coefficient of 0.391 and a significance level of 0.000. The t-value of 3.913 confirmed the significance of the relationship. This finding suggests that when customer expectations are met or exceeded, they are more likely to remain loyal. The results support **[19]**, who argued that satisfaction increases customer retention, positive word-of-mouth, and repeat purchases.

4.4 The moderating effect of user satisfaction

User satisfaction was found to moderate the relationships between both chatbot usage and social media marketing with loyalty. The findings suggest that satisfaction enhances the positive impact of chatbot usage and social media marketing on customer loyalty. This result is in line with **[7]**, who reported that satisfaction derived from accurate, interactive, and responsive digital services reinforces loyalty. Similarly, **[20]** found that creative and informative social media campaigns improve satisfaction, thereby strengthening loyalty.

5. Conclusion

Based on the results of testing, processing, and data analysis, it can be concluded that chatbot usage, social media marketing, and user satisfaction each have a significant partial effect on loyalty in Banda Aceh. Furthermore, the study reveals that user satisfaction serves as a mediating variable that strengthens the effect of chatbots on loyalty and mediates the relationship between social media marketing and loyalty. Thus, both directly and indirectly through user satisfaction, chatbots and social media marketing play a crucial role in enhancing consumer loyalty in Banda Aceh.

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Authors' contributions and responsibilities

Aida Fitri: conceptualization, methodology, writing – original draft, supervision. Muhammad Jaka Wiratama: investigation, formal analysis, visualization. Daffa Azka: supervision, writing – review & editing. Harbiyah G: resources, original draft, writing – review & editing.

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Availability of data and materials

All data are available from the authors.

Competing interests

The authors declare no competing interest.

Additional information

No additional information from the authors.

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