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The Impact of AI-Based Marketing, Chatbots, and Social Media on Customer Satisfaction and the Economic Behavior of MSMEs Consumers in Jambi City

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ABSTRACT

This study investigates the influence of AI-based marketing, chatbot services, and social media activities on customer satisfaction and consumer economic behavior among Micro, Small, and Medium Enterprises (MSMEs) in Jambi City. A quantitative approach was applied, and data were collected from 400 respondents using a structured questionnaire. The analysis was conducted using Structural Equation Modeling (SEM) with SmartPLS 4. The results indicate that AI-based marketing, chatbot services, and social media engagement each have a significant positive effect on customer satisfaction. Furthermore, customer satisfaction significantly influences consumer economic behavior. The study also finds that customer satisfaction mediates the relationship between digital marketing strategies and consumer behavior. These findings highlight the strategic role of digital technologies in enhancing customer experiences and shaping consumer engagement in the MSME sector.

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Introduction

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In Digital technology is growing rapidly, particularly in artificial intelligence (AI)-based marketing, chatbots, and social media. MSMEs in Jambi City, as a sector that plays an important role in the local economy, face challenges in adopting this technology optimally. In the digital era, the rapid advancement of marketing technologies particularly artificial intelligence (AI), chatbots, and social media platforms has significantly transformed the way businesses design and implement their marketing strategies. This transformation is especially crucial for Micro, Small, and Medium Enterprises (MSMEs) in developing regions such as Jambi, Indonesia, where businesses often face structural challenges, including limited marketing budgets, restricted access to markets, and relatively low digital adoption rates. Traditional marketing channels such as print advertisements, brochures, and face-to-face promotions typically involve higher costs, limited geographic reach, and less effective customer engagement. In contrast, digital technologies enable cost efficient, data driven, and interactive marketing strategies that can help MSMEs overcome these limitations [1].

Social media allows MSMEs to reach a broader audience with minimal promotional costs while enabling two-way communication, real-time feedback, and strong community engagement. Unlike conventional marketing approaches, social media supports targeted promotions, content personalization, and viral dissemination, which are highly effective in increasing brand awareness and consumer trust [1]. Moreover, AI-powered marketing strengthens these benefits by analyzing consumer data to predict market trends, personalize advertisements, and optimize promotional campaigns. Similarly, chatbots provide MSMEs with automated 24/7 customer service, improving responsiveness, operational efficiency, and customer satisfaction [2]. In the context of Jambi's MSMEs, these technologies are particularly relevant because they offer the ability to leapfrog traditional barriers, such as limited capital and infrastructure constraints, by enabling cost effective marketing with measurable outcomes. Integrating AI, chatbots, and social media can help MSMEs expand their market reach, strengthen customer relationships, and enhance marketing performance without requiring substantial physical infrastructure[3]. Furthermore, digital marketing technologies are more adaptive to changing consumer behaviors in the post-pandemic era,

making them essential tools for local businesses seeking long-term resilience and competitiveness.

This study, therefore, aims to examine the role of AI, chatbots, and social media in improving marketing performance among MSMEs in Jambi. It also seeks to highlight how these technologies compare with traditional marketing methods in this local context, providing both theoretical contributions and practical implications for MSME development strategies. By doing so, the research addresses a critical gap in understanding how digital transformation can be strategically leveraged to strengthen local economies in emerging regions. Although digital marketing technologies such as AI, chatbots, and social media offer significant advantages for business growth, there remains a clear gap in the implementation and understanding of these strategies among MSMEs. Many MSMEs lack adequate knowledge, digital skills, and financial resources to effectively adopt these technologies.

This gap limits their ability to compete with larger firms, reduce operational costs, and expand market reach. In regions like Jambi, this challenge is amplified by limited digital infrastructure and low levels of technological literacy [4]. This gap has led to limited digital transformation among MSMEs, reducing their marketing efficiency and competitiveness in the digital era. Many MSMEs still face challenges such as a lack of digital literacy, insufficient financial resources to adopt AI-based tools, and limited understanding of how to integrate social media or chatbot technology into their marketing activities. In line with this, the number of MSMEs continues to grow across various regions in Indonesia, including Jambi Province, yet their ability to leverage digital marketing innovation remains uneven. In line with that, the growth of the number of MSMEs in various regions of Indonesia, especially MSMEs development data, one of which is Jambi Province based on MSMEs Criteria.

Table 1. MSME data for 2021-2023 Jambi Province

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No.	MSME CRITERIA	Year 2021	Year 2022	Year 2023
1	Micro	152.373	171.852	165.558
2	Small	10.708	9.849	9.608
3	Prevent	2 .416	2.341	885
	Total	165.497	184.042	176.051

Source: Central Statistics Agency of Jambi Province 2021-2023

The development of MSMEs shows that the number of micro MSMEs increased in 2022 but decreased in 2023. Small MSMEs have declined since 2021, while medium MSMEs have declined significantly in 2023. The development of MSMEs in Jambi Province in 2022 shows fluctuations in number, but still faces obstacles, such as suboptimal marketing, low technology utilization, weak productivity, limited access to financing, and poor management. The Society 5.0 era strengthens the role of technology in human life, including in the business world. Infinitely interconnected technologies create new complexities, so business actors need to adapt to maintain their competitiveness [5]. In the context of marketing, AI has made a significant impact by offering benefits such as personalization of customer experience, optimization of advertising campaigns, and data-driven decision-making. Experts emphasize that AI-based interactions can foster customer loyalty and create a better experience [6].

Not only in marketing, AI also plays a role in various other sectors such as agriculture, economy, industry, and medicine. AI has been used in stock and foreign exchange forecasting through advanced algorithms that help decision-making [7]. In addition, the application of AI in digital marketing has improved business efficiency, allowing for faster data analysis as well as more effective automation of promotional processes [8]. One form of AI implementation in marketing is chatbots. Chatbots assist customers in finding information, answering questions, and completing transactions. The implementation of chatbots has been proven to increase customer satisfaction as well as encourage impulsive buying behavior and repurchase intent [9]. In the financial sector, chatbots are used to improve customer service, optimize responses to questions, and resolve issues faster [10]. The analysis shows that chatbots and other AI devices, such as predictive analytics and personalization engines, significantly improve e-commerce performance [11].

In an increasingly competitive digital business environment, chatbots not only serve as customer service, but also play a role in increasing customer loyalty and marketing effectiveness. The integration of chatbots into financial services has helped improve customer satisfaction through faster and more efficient automated solutions [12]. In addition, the study found that the extrinsic and intrinsic value of chatbots have a positive effect on consumer satisfaction, suggesting that AI-based digital interactions have great potential in improving customer experience [13]. Social media also plays an important role in MSME digital marketing. Previous studies have shown that entrepreneurial orientation, product innovation, and the use of social media have an effect on the competitive advantage and marketing performance of MSMEs in Jambi City [14]. Additionally, other research highlights that chatbots and AI provide a more efficient purchasing experience as well as improve customer engagement [15]. By understanding customer engagement through chatbots and virtual assistants, businesses can gain valuable insights to improve interactions with consumers [16].

In the world of investment and finance, AI-based analytics and social media have helped investors avoid mistakes in decision-making [17]. Research on SMEs in Jambi City found that social media has a significant influence on competitive advantage and marketing performance, and shows that product innovation and social media have a strong mediating effect on marketing performance [18]. Although digital adoption in the form of e-commerce and food delivery applications has been implemented by MSMEs, the use of AI is still limited. A small percentage of MSMEs have adopted chatbots as automated communication solutions with customers, but in general the application of AI in this sector is still in its early stages [19]. However, other research results revealed that the adoption of artificial intelligence is still not widely used by MSMEs. However, some MSMEs have adopted artificial intelligence technology such as chatbot applications for communication services. Research on AI-powered recommendation systems reveals that AI-based personalization can increase sales by 25% and user engagement by 30%, although there are still challenges in terms of algorithmic bias and data privacy [20].

The development of AI and social media is also in line with the principles of behavioral economics. These technological advancements allow marketers to understand consumer behavior more deeply, as well as direct their decision-making more responsibly [21]. Most studies on behavioral economics and AI focus on decision-making in uncertainty, behavioral game theory, as well as machine learning, all of which are relevant in understanding consumer economic behavior [22]. In addition, recent research shows that consumption behavior can be influenced by self-efficacy and intensity of social media use, where the intensity of social media use contributes more to shaping consumer consumption patterns [23]. From the Research Results [24] also revealed that the chatbot was developed to improve customer service at Kafe Duniawi Coffee, making it easier for potential visitors to get information and function as a communication tool that can respond to visitors anywhere as long as the server is still running. Research [25];[26];[27];[28];[29] previous shows that the use of AI, chatbots, and social media helps MSMEs provide faster and easier services, so that customers become more satisfied and trusted. These methods also make customers buy more often at MSMEs. All research it agrees that AI, chatbots, and social media play an important role in modern marketing, having a significant impact on customer satisfaction, loyalty, purchasing decisions, and digital consumption behavior [30];[31];[32];[33];[34];[35];[36].

Digital transformation has profoundly changed the way businesses operate, particularly through the adoption of Artificial Intelligence (AI), chatbots, and social media technologies. These digital innovations enable companies to improve marketing efficiency, personalize customer experiences, and make data driven decisions. However, in developing regions such as Jambi City, Micro, Small, and Medium Enterprises (MSMEs) still face major challenges in fully adopting AI-based marketing tools due to limited resources, digital skills, and infrastructure readiness. According to data from the Central Statistics Agency of Jambi Province (2021–2023), the number of MSMEs fluctuated micro enterprises increased in 2022 but declined in 2023 indicating that digital adaptation remains inconsistent and technology integration suboptimal. The urgency of this study arises from the need to strengthen MSME competitiveness through technology adoption that can

improve customer satisfaction and stimulate positive consumer economic behavior. While previous studies have examined AI, chatbots, or social media separately [37], there remains a research gap in integrating these three technologies into a unified framework to understand their combined influence on MSME customer satisfaction and behavioral economics in Indonesia. Moreover, most research has focused on large corporations, leaving MSMEs in emerging markets underrepresented in empirical data.

This study introduces a novel model that integrates AI-based marketing, chatbots, and social media engagement to analyze both their direct and indirect impacts via customer satisfaction on consumer economic behavior. The novelty of this research lies in bridging digital marketing and behavioral economics theories by identifying satisfaction as the mediating psychological mechanism that transforms digital interaction into economic action. Theoretically, this study enriches digital marketing and consumer behavior literature by extending the Technology Acceptance Model (TAM) to an AI-driven MSME context. Practically, the findings contribute strategic implications for MSME owners and policymakers in Jambi to optimize AI and social media tools for sustaining customer loyalty and digital competitiveness.

Method

This study employed a quantitative research design with a survey method, involving 400 respondents who were consumers or customers of MSMEs in Jambi Province, Indonesia. Respondents were selected using a random sampling technique to ensure that the sample adequately represented the MSME customer population. The inclusion criteria for this study were individuals who had purchased products or services from MSMEs in the past six months. The sample size of 400 respondents was determined using the Cochran formula, ensuring sufficient statistical power for the Structural Equation Modeling (SEM) analysis using SmartPLS. The research instrument was a questionnaire adapted from a previously validated measurement scale, covering variables such as AI-based marketing,

chatbots, social media engagement, customer satisfaction, and consumer economic behavior. Prior to primary data collection, a pilot test was conducted with 30 respondents to verify the clarity and relevance of the questions. Content validity was confirmed through expert review in the fields of marketing and consumer behavior.

Next, construct validity was analyzed in two stages: Convergent validity, which was evaluated using factor loading values. Each indicator with a factor loading value above 0.70 was deemed to meet convergent validity criteria. Discriminant validity, which was met if the value of each construct was greater than the correlation between the other constructs, was assessed. After the measurement model (outer model) met validity and reliability criteria, the structural model (inner model) was tested using the bootstrapping procedure in SmartPLS to test the research hypotheses. Hypothesis testing used t-statistics and p-values with a 5% significance level ($\alpha = 0.05$). The 5% significance level was chosen because it is the most commonly used threshold in social science research, providing a balance between minimizing Type I errors (false positives) and maintaining adequate statistical power to detect true effects. A hypothesis was declared significant if the t-statistic value was greater than 1.96 and the p-value was less than 0.05. This study also considered ethical aspects of research, including voluntary participation, informed consent, and respondent confidentiality and anonymity.

Results and Discussion

Before presenting the outer loading table, it is essential to evaluate the measurement model to ensure that each indicator used in this study accurately measures its intended construct. The assessment of the measurement model includes testing for convergent validity, discriminant validity, and reliability. Convergent validity is examined through the outer loading values of each indicator, which reflect the degree to which items correlate with their respective latent variables. An indicator is considered valid if its outer loading value exceeds 0.70, indicating that the indicator effectively represents the underlying construct [38]. The following table presents the outer loading values for all indicators used in this study.

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Table 2. Outer Loading

	AI - Based Marketing (AIBM)	Chatbot (CB)	Consumer Economic Behavior (CEB)	Customer Satisfaction (CS)	Social Media (SM)
AIBM.2	0,805				
AIBM.3	0,778				
CB.1		0,820			
CB.2		0,774			
CB.3		0,764			
CB.4		0,732			
CEB.1			0,869		
CEB.2			0,836		
CS.1				0,844	
CS.2				0,845	
CS.3				0,817	
SM.1					0,807
SM.2					0,821
SM.3					0,768
SM.4					0,713
AIBM.1	0,853				

Source: SmartPLS4

The table above presents the results of the outer loading test used to assess the convergent validity of the measurement model in this study. The outer loading values indicate how strongly each indicator represents its corresponding latent construct, namely AI-Based Marketing (AIBM), Chatbot (CB), Consumer Economic Behavior (CEB), Customer Satisfaction (CS), and Social Media (SM). Indicators are considered valid when their loading values exceed 0.70. The results show that all indicators have loading values ranging from 0.713 to 0.869, indicating that all items are valid and effectively explain their respective variables [38]. Therefore, the research instrument is deemed reliable and appropriate, as all indicators contribute strongly to their measured constructs.

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Table 3. Cross Loading

	Ai - Based Marketing (AIBM)	Chatbot (CB)	Consumer Economic Behavior (CEB)	Customer Satisfaction (CS)	SOCIAL MEDIA (SM)
AIBM.2	0,805	0,562	0,361	0,496	0,400
AIBM.3	0,778	0,478	0,340	0,505	0,397
CB.1	0,547	0,820	0,418	0,507	0,452
CB.2	0,558	0,774	0,341	0,466	0,389
CB.3	0,465	0,764	0,379	0,514	0,484
CB.4	0,518	0,732	0,386	0,451	0,468
CEB.1	0,387	0,439	0,869	0,502	0,492
CEB.2	0,358	0,401	0,836	0,454	0,539
CS.1	0,525	0,533	0,468	0,844	0,545
CS.2	0,607	0,598	0,451	0,845	0,480
CS.3	0,446	0,437	0,492	0,817	0,490
SM.1	0,459	0,469	0,458	0,472	0,807
SM.2	0,400	0,505	0,507	0,521	0,821
SM.3	0,492	0,451	0,409	0,451	0,768
SM.4	0,321	0,373	0,503	0,432	0,713
AIBM.1	0,853	0,599	0,365	0,538	0,506

Source: SmartPLS4

The cross loading table shows the discriminant validity test results, which evaluate whether each indicator is more strongly associated with its own construct than with other constructs. The results indicate that all indicators, such as those for AI-Based Marketing, Chatbot, Consumer Economic Behavior, Customer Satisfaction, and Social Media, have the highest loading values on their respective variables. This confirms that each item uniquely measures its intended construct, thereby fulfilling the discriminant validity requirement and ensuring that the measurement model is valid and reliable.

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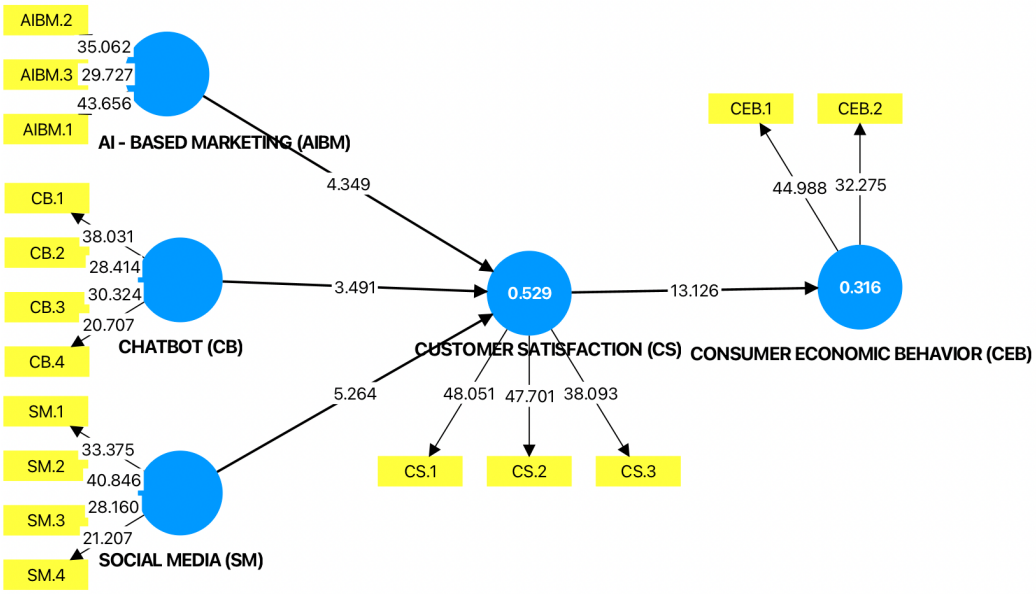

Figure 1. Results of the Bootstrapping Analysis

Source: SmartPLS4

The bootstrapping results illustrate the significance testing of relationships between variables in the structural model. Each path coefficient indicates the strength and direction of influence among constructs such as AI-Based Marketing, Chatbot, Social Media, Customer Satisfaction, and Consumer Economic Behavior. Relationship is considered significant when the *t-statistics* value exceeds 1.96 or the *p-value* is less than 0.05. Therefore, the bootstrapping output helps confirm which hypotheses are supported and which are not, ensuring that the proposed structural model has statistically validated relationships between constructs [38].

The table of results for inner weights from the bootstrapping output is used to determine the direct effects between variables for each hypothesis. This is done by examining the path coefficient values of each hypothesis and the t-statistic values. A good path coefficient should exceed >0.5. This coefficient can be found in the 'Original Sample

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(O)' column. The t-statistic values are found in the 'T Statistics (|O/STDEV|)' column of the results for inner weights table. A t-statistic value greater than 1.96 indicates a significant direct effect for each hypothesis.

Table 4. Direct Effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
AI - Based Marketing (AIBM) -> Customer Satisfaction (CS)	0,304	0,302	0,070	4,349	0,000
Chatbot (CB) -> Customer Satisfaction (CS)	0,253	0,255	0,072	3,491	0,000
Customer Satisfaction (CS) -> Consumer Economic Behavior (CEB)	0,562	0,564	0,043	13,126	0,000
Social Media (SM) -> Customer Satisfaction (CS)	0,294	0,297	0,056	5,264	0,000

Source: SmartPLS4

Table 5. Indirect Effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Social Media (SM) -> Customer Satisfaction (CS) -> Consumer Economic Behavior (CEB)	0,165	0,169	0,038	4,376	0,000
AI - Based Marketing (AIBM) -> Customer Satisfaction (CS) -> Consumer Economic Behavior (CEB)	0,171	0,170	0,039	4,401	0,000
Chatbot (CB) -> Customer Satisfaction (CS) -> Consumer Economic Behavior (CEB)	0,142	0,145	0,044	3,201	0,001

Source: SmartPLS4

Beyond statistical significance, the magnitude of the coefficients provides valuable managerial insights. The path coefficient between customer satisfaction and consumer

economic behavior (β = 0.562) indicates that every one-unit increase in satisfaction improves consumer economic behavior by approximately 56%. Likewise, AI-based marketing (β = 0.304), chatbot service quality (β = 0.253), and social media engagement (β = 0.294) each contribute substantially to enhancing customer satisfaction. These findings demonstrate that digital interaction quality characterized by personalization, responsiveness, and consistent social engagement strongly drives consumer loyalty and purchasing consistency.

The mediating analysis also reveals that customer satisfaction effectively transmits the influence of AI-based marketing, chatbots, and social media on consumer economic behavior (β = 0.171, 0.142, and 0.165; $p < 0.001$). This suggests that the impact of digital marketing technologies on consumer decisions occurs indirectly through satisfaction rather than through direct persuasion alone. Therefore, satisfaction acts as a key behavioral bridge between technology-driven experiences and sustainable economic actions among MSME consumers.

Based on the analysis results presented in Table 4 and Table 5, it can be concluded that all variables have a positive and significant effect on both customer satisfaction and consumer economic behavior. The path coefficient of AI-based marketing on customer satisfaction is 0.304, indicating that each increase in the effectiveness of AI strategies leads to a 30.4% increase in customer satisfaction. The chatbot variable has a coefficient of 0.253, emphasizing the importance of response speed, ease of interaction, and information accuracy in shaping a positive digital experience. Meanwhile, social media shows a coefficient of 0.294, demonstrating the strong role of social interaction and customer engagement in building satisfaction. The path coefficient of customer satisfaction on consumer economic behavior is 0.562 (t = 13.126), making it the most dominant effect, which indicates that customer satisfaction is a key factor in driving loyalty, repeat purchases, and the intensity of digital consumption.

Furthermore, the mediation analysis through customer satisfaction as a mediating variable shows significant results for all three digital marketing variables. The mediation coefficient of AI-based marketing on consumer economic behavior is 0.171, chatbot 0.142,

and social media 0.165 all significant (t > 1.96). These findings indicate that the impact of digital technology on consumer economic behavior does not occur directly but rather through the enhancement of customer satisfaction as a psychological bridge that strengthens digital experiences into actual economic actions. This aligns with the Technology Acceptance Model (TAM) and Expectation Confirmation Theory (ECT), which emphasize satisfaction as a key mechanism shaping consumer behavioral intentions. In the context of MSMEs in Jambi, these results confirm that the integrated use of AI, chatbots, and social media can strengthen customer loyalty, enhance digital experiences, and expand market potential in a sustainable manner.

Based on Table 4 and Table 5, the results of hypothesis testing using t-statistics can be explained as follows:

Direct Effect : 1) AI-based marketing on customer satisfaction : The t-statistic value for AI-based marketing on customer satisfaction is 4.349, which is greater than the t-table value of 1.96. This result shows that AI-based marketing has a significant effect on customer satisfaction. 2) Chatbot on customer satisfaction: The t-statistic value for Chatbot on customer satisfaction is 3.491, which is greater than the t-table value of 1.96. This means that Chatbot has a significant effect on customer satisfaction. 3) Social media on customer satisfaction: The t-statistic value for Social media on customer satisfaction is 5.264, which is greater than the t-table value of 1.96. This shows that social media has a significant effect on customer satisfaction. 4) Customer satisfaction on consumer economic behavior: The t-statistic value for customer satisfaction on consumer economic behavior is 13.126, which is greater than the t-table value of 1.96. This indicates that customer satisfaction has a significant effect on consumer economic behavior.

Indirect effect: 1) Customer satisfaction mediates the relationship between AI-based marketing and consumer economic behavior; The t-statistic value for this relationship is 4.401, which is greater than the t-table value of 1.96. This means that customer satisfaction significantly mediates the effect of AI-based marketing on consumer economic behavior. 2) Customer satisfaction mediates the relationship between Chatbot and consumer economic behavior; The t-statistic value for this relationship is 3.201, which is greater than the t-table

value of 1.96. This indicates that customer satisfaction significantly mediates the effect of Chatbot on consumer economic behavior. 3) Customer satisfaction mediates the relationship between social media and consumer economic behavior; The t-statistic value for this relationship is 4.376, which is greater than the t-table value of 1.96. This shows that customer satisfaction significantly mediates the effect of social media on consumer economic behavior.

Discussion

AI-Based Marketing Significantly Affects Customer Satisfaction

AI-based marketing significantly enhances customer satisfaction (t = 4.349 > 1.96), confirming that personalized, data driven promotions and real-time services improve consumer experiences. This result who found that AI personalization strengthens brand image and perceived quality, and [39], who emphasized that efficiency gains from AI-based systems increase loyalty. Who noted that price sensitivity dominates satisfaction in telecommunications. For MSMEs, personalized recommendations and automation appear more decisive than pricing factors, reinforcing the TAM concept that perceived usefulness and ease of use lead to satisfaction and adoption. AI-based marketing has a significant effect on customer satisfaction with a t-statistic value of 4.439 (> 1.96), showing that the presence of AI, service personalization, process efficiency, and promotional optimization successfully create a satisfying digital experience for customers. AI-based marketing strategies that can recognize individual preferences in real-time make customers feel valued, thereby increasing their satisfaction with the service.

This empirical evidence confirms that when AI is optimally used, including in creating relevant promotional content and efficiently managing interactions, customers not only feel satisfied with the service but also have a stronger intention to recommend it to others. That brand image has a positive and significant effect on customer satisfaction. Furthermore, AI-based service quality, AI-based interaction, and AI-based customization are positively correlated with brand image [40]. The study also supports the mediating role

of brand image and helps banking strategists in Saudi Arabia leverage technology to improve customer satisfaction. Provide strong evidence of the significant impact of AI-based customer service on customer satisfaction and perceived efficiency [39]. Showed that AI personalization has a significant positive relationship with customer satisfaction, as proven by a significant positive correlation with repeat purchases and customer referrals [41].

Moreover, in the context of MSMEs, AI adoption plays a critical role because these businesses often face limited human resources and marketing budgets. By automating interactions and tailoring promotions, AI provides MSMEs with a *competitive leverage* similar to large enterprises. This is particularly important in emerging markets, where customer experience is often a key differentiator. The findings also suggest that for MSMEs, personalized recommendations and process automation have a stronger influence on satisfaction than price sensitivity, which traditionally dominates satisfaction in sectors such as telecommunications. Strategically, this means MSMEs should not view AI merely as a technological upgrade but as an integrated marketing strategy that enhances customer relationships, accelerates service delivery, and builds sustainable loyalty. Thus, AI-based marketing not only improves satisfaction but also lays the groundwork for stronger behavioral intentions such as repurchase and advocacy.

Chatbots Significantly Affect Customer Satisfaction

The influence of chatbots on satisfaction (t = 3.491) highlights the importance of responsiveness, interactivity, and accuracy in digital communication. This finding aligns with [42], who identified chatbots as key drivers of service quality, Linked playfulness and social presence to user satisfaction. The present study extends their insights to MSMEs, showing that even small enterprises can replicate human like service quality through chatbots, improving satisfaction and loyalty in digital interactions. The analysis shows that chatbots significantly affect customer satisfaction with a t-statistic value of 3.491. Chatbot features such as response speed, ease of interaction, information accuracy, and service availability play a key role in shaping a positive digital experience. Chatbots that respond quickly and accurately help reduce customer frustration and improve interaction comfort.

Customers who are served efficiently by chatbots tend to rate the overall service quality higher, leading to increased satisfaction. This also encourages them to recommend the service to others as a reflection of their satisfaction. Found that these functions positively affect service quality, the main functional goal of chatbots [43]. Revealed that chatbots influence customer loyalty. System quality, service quality, and information quality are essential dimensions that chatbots must fulfill to provide a good customer experience. To make chatbots more personal, companies can adjust their language style. Human like chatbots generate greater satisfaction and trust among users, leading to broader adoption [44]. Showed that chatbot characteristics such as ease of use, playfulness, and usefulness significantly increase service value in mobile fashion shopping, while social presence had no significant effect on service value. However, for customer satisfaction, social presence, playfulness, and usefulness were significant, while ease of use was not [45].

This aligns with *Technology Acceptance Model (TAM)* assumptions: when technology is perceived as useful and enjoyable, it triggers positive attitudes and satisfaction. Strategically, this means MSMEs should not view chatbots merely as automated service tools, but as experience amplifiers. By designing chatbot conversations that are fast, natural, and personalized such as using human like language or adaptive responses businesses can build deeper customer trust and increase emotional attachment. This not only enhances satisfaction but also encourages loyalty and positive word-of-mouth, which are crucial for MSME competitiveness in a digital economy.

Social Media Significantly Affects Customer Satisfaction

Social media has the strongest effect on satisfaction ($t = 5.264$), demonstrating that frequent activity, customer interaction, and engaging content improve emotional connections with customers. This supports found that perceived social media quality enhances satisfaction and trust. Unlike studies in large corporations that emphasize branding, this study reveals that for MSMEs, interactive engagement such as prompt replies and consumer feedback plays a more critical role than promotional intensity [46]. Social media

significantly affects customer satisfaction with a t-statistic value of 5.264. The dimensions of activity frequency, customer interaction, promotional content, and consumer engagement contribute to enhancing the digital customer experience. A brand's active presence on social media allows customers to stay connected, receive updates, and feel involved in two-way communication.

Consistent interaction through engaging content increases customer satisfaction with the overall service. When customers feel appreciated and involved on a company's social media platform, they become more satisfied and develop a positive perception of the service. That social media plays an important role in delivering information to customers and acts as an antecedent that enhances salesperson behavior to increase customer satisfaction [47]. That in mobile social media contexts, service quality dimensions usefulness, convenience, design, and security/privacy significantly and positively influence customer satisfaction [46]. Showed that both digital marketing strategies through social media and price promotions directly increase customer satisfaction [48]. Unlike large corporations where social media is often focused on branding and image management, MSMEs rely more on personal interaction to build strong customer relationships. Quick responses to comments, personalized messages, and interactive feedback loops make customers feel acknowledged and emotionally attached to the business. This emotional closeness builds trust and a sense of community—two critical components of satisfaction and loyalty. In emerging markets like Jambi, where personal trust remains a major driver of consumer decisions, this relational interaction is even more powerful than formal brand campaigns.

Strategically, this finding indicates that MSMEs should invest in structured social media strategies that prioritize engagement over broadcasting. By maintaining consistent activity and fostering genuine dialogue with consumers, MSMEs can transform social media from a mere marketing channel into a relationship-building ecosystem. This does not require large financial investment but rather strategic time allocation, content planning, and real-time responsiveness. Such efforts can significantly increase satisfaction, strengthen trust, and encourage repeat purchasing behavior.

Customer Satisfaction Significantly Affects Consumer Economic Behavior

Customer satisfaction exerts a major impact on consumer economic behavior (t = 13.126), consistent with [49], who confirmed satisfaction as a driver of loyalty and purchase repetition. This finding reinforces behavioral economics theory, indicating that emotional satisfaction influences rational consumer decisions. Satisfied consumers not only repeat purchases but also engage in advocacy and social influence, generating positive economic cycles for MSMEs. A t-statistic value of 13.126 shows that customer satisfaction significantly affects consumer economic behavior. When customers are satisfied with the service, experience a pleasant digital journey, and intend to recommend it, they tend to show high loyalty and consistent purchasing decisions. This satisfaction fosters sustainable digital consumption preferences. Satisfied customers are more open to repeat purchases and brand loyalty, ultimately leading to favorable economic behavior for businesses. showed That in Indonesia's highly competitive e-commerce environment, factors related to customer experience, brand perception, and trust are more influential in shaping satisfaction than price alone [50]. This finding urges e-commerce businesses to focus on improving service quality and customer experience to maintain satisfaction and loyalty.

That understanding consumer behavior significantly affects customer satisfaction, which in turn drives value creation, especially for micro and small service businesses [51]. Stated that customer satisfaction strengthens the relationship between price and packaging perception and purchasing decisions. Therefore, product managers should not only focus on pricing strategies but also consider packaging elements to effectively boost satisfaction and consumer buying interest [52]. In the MSME context, this relationship becomes particularly crucial. Unlike large corporations that may rely on scale or heavy branding, MSMEs often depend on long term customer relationships as their main source of sustainable income. Satisfied customers are not only more likely to make repeat purchases but also to act as informal brand ambassadors promoting businesses through trusted social networks. This creates a positive economic multiplier effect, where satisfaction leads to loyalty, loyalty leads to retention, and retention lowers marketing costs while increasing revenues.

Strategically, this finding highlights that MSMEs should treat customer satisfaction as a core economic driver, not just a marketing KPI. Investments in improving service quality, personalization, and customer experience are likely to yield stronger behavioral responses than competing solely on price. Building trust and emotional attachment through consistent service quality can secure long-term consumer economic behavior, making satisfaction a strategic pillar for sustainable business growth.

Customer Satisfaction Significantly Mediates the Effect of AI Marketing on Consumer Economic Behavior

Customer satisfaction is proven to mediate the relationship between AI-based marketing and consumer economic behavior with a t-statistic value of 4.401. This indicates that the success of AI in creating personalized, efficient, and optimized promotional interactions will more effectively shape consumer behavior when accompanied by customer satisfaction. Consumers satisfied with responsive and relevant AI-based services are more likely to develop loyalty and stronger digital consumption preferences. Without satisfaction, AI marketing efforts may not directly influence consumer behavior. Showed that AI technologies like machine learning, natural language processing, and expert systems help companies identify customer needs, personalize services, and improve promotional effectiveness [53]. Thus, AI not only enhances operational efficiency but also significantly contributes to improving customer satisfaction, loyalty, and sales predictions making it a strategic asset for navigating consumer behavior in the digital age.

That marketing through AI-based chatbots significantly increases customer satisfaction, which in turn positively affects customer loyalty in the online shopping context in Saudi Arabia. The study also found that customer satisfaction mediates the relationship between AI chatbot marketing and customer loyalty, meaning the chatbot's impact on loyalty primarily operates through improved satisfaction [54]. Emphasized the role of AI in predicting consumer behavior and optimizing marketing strategies. AI can analyze large data sets such as purchase histories and survey responses to understand and forecast customer behavior using machine learning techniques [55]. The findings show that

customer satisfaction significantly mediates the relationship between AI-based marketing and consumer economic behavior. This indicates that the effectiveness of AI in creating personalized, efficient, and optimized promotional interactions becomes more impactful when accompanied by high levels of satisfaction. Theoretically, this aligns with the Technology Acceptance Model (TAM) and Expectation Confirmation Theory (ECT), which posit that perceived usefulness and positive experiences with technology increase satisfaction and subsequent behavioral intention [56]. In marketing contexts, AI enhances customer engagement by providing tailored recommendations, predictive analytics, and automated services, thereby increasing perceived service quality and overall satisfaction.

From a consumer behavior perspective, satisfaction acts as a psychological mechanism that translates cognitive evaluations into economic behavior such as purchase decisions and loyalty [57]. The adoption of AI in marketing enables real-time personalization and seamless customer interaction, improving both functional and emotional value. When consumers perceive the interaction as relevant and effortless, satisfaction rises, leading to consistent and loyal consumption behavior. Thus, AI marketing not only automates decision-making but also strengthens customer trust and satisfaction, which in turn fosters positive economic outcomes. This finding who demonstrated that AI-based marketing positively affects satisfaction and loyalty through personalization and improved brand image. Similarly, Found that AI-driven systems enhance satisfaction and repurchase intentions by improving service efficiency and predictive accuracy [39]. Further confirmed that in the Saudi Arabian online shopping context, satisfaction mediates the relationship between AI chatbot marketing and customer loyalty showing that AI's impact operates primarily through improved satisfaction [58].

Moreover, Emphasized that machine learning and expert systems enable firms to understand customer preferences and forecast behavior more precisely, thereby strengthening satisfaction and purchase likelihood. Empirically, these results reinforce that satisfaction bridges AI adoption and digital consumer behavior, validating that AI marketing not only increases operational efficiency but also enhances emotional connection and

economic engagement [59]. From a consumer behavior perspective, satisfaction serves as a psychological mechanism that converts cognitive evaluations into actual economic decisions. When customers feel that AI tools are not only efficient but also emotionally engaging by recognizing preferences, recommending relevant products, and providing quick support they perceive higher value. This leads to trust formation, brand attachment, and consistent consumption patterns. Without satisfaction, even advanced AI marketing technologies may fail to generate sustained behavioral impact because the interaction remains transactional, not relational. For MSMEs, this mediating effect is strategically critical. Unlike large corporations with heavy advertising power, MSMEs can compete through superior customer experience. By adopting AI for personalization and combining it with service quality enhancement, MSMEs can create stronger satisfaction and loyalty effects than traditional marketing methods. This is particularly relevant in emerging markets like Indonesia, where trust and relationship quality are central to consumer decision-making.

Strategically, the findings suggest that MSMEs should not focus solely on adopting AI technology, but on integrating AI with customer satisfaction strategies such as feedback loops, continuous personalization, and responsive communication. In this way, AI functions not merely as an operational tool but as a behavioral catalyst that amplifies satisfaction and transforms it into economic outcomes like repeat purchase, increased transaction value, and positive word-of-mouth.

Customer Satisfaction Significantly Mediates the Effect of Chatbots on Consumer Economic Behavior

Customer satisfaction also mediates the effect of chatbots on consumer economic behavior, with a t-statistic value of 3.201. Chatbots with fast responses, ease of use, and accurate information create satisfying service experiences that lead to purchasing decisions and loyalty. In other words, a fast chatbot alone is not enough to change consumer behavior without delivering satisfaction. Satisfaction plays a key mediating role in linking chatbot services with purchasing behavior and ongoing digital preferences. Showed that using anthropomorphic (human-like) chatbots in food e-commerce significantly increases

customer satisfaction [60]. That satisfaction with chatbot usage significantly affects the intention to reuse chatbots and has a greater impact than the intention to make online purchases [61]. Revealed that AI-based chatbots play a key role in enhancing user satisfaction, continued usage intention, and encouraging positive electronic word of mouth (e-WOM) in the online shopping context [62].

Customer satisfaction is also proven to mediate the relationship between chatbot services and consumer economic behavior, suggesting that fast response, usability, and accurate information contribute to service satisfaction, which in turn shapes purchasing decisions and loyalty. This finding is supported by the SERVQUAL model [63], which highlights reliability, responsiveness, and assurance as key determinants of satisfaction. In the digital context, anthropomorphic (human-like) chatbots enhance social presence, creating a sense of warmth and interactivity that increases user satisfaction and trust in the brand. According to the Theory of Planned Behavior [64], behavioral intentions are influenced by attitudes and perceived control both of which are shaped by satisfaction. Chatbots that deliver personalized, friendly, and seamless conversations elevate both emotional and cognitive satisfaction, fostering continued usage and purchase behavior. Therefore, customer satisfaction functions as a mediating psychological factor that links service quality with consistent economic action in digital environments.

Demonstrated that anthropomorphic chatbots significantly increase customer satisfaction in food e-commerce [60]. Similarly, reported that satisfaction from chatbot interaction has a stronger effect on reuse intention than on direct purchase intention. This confirms that satisfaction acts as a behavioral gateway that connects chatbot experiences to consumer loyalty and repetitive engagement [61]. Additionally, revealed that AI-based chatbots enhance satisfaction, continuous usage intention, and positive electronic word of mouth (e-WOM) in online shopping. These empirical results align with the current study's conclusion that the chatbot's influence on economic behavior occurs indirectly through the satisfaction pathway underscoring satisfaction as the emotional core of digital consumer engagement.

Strategically, these findings provide an important implication for MSMEs. Unlike large firms with advanced CRM systems, MSMEs can use chatbots to replicate high quality service interactions at low cost. However, the real impact is not in chatbot deployment alone but in how well the chatbot experience satisfies users through natural conversation, friendliness, and quick assistance. This satisfaction builds loyalty, drives repeat purchases, and encourages positive digital word of mouth, creating a long-term competitive advantage in the digital marketplace.

Customer Satisfaction Significantly Mediates the Effect of Social Media on Consumer Economic Behavior

Social media influences consumer economic behavior indirectly through customer satisfaction, with a t-statistic value of 4.376. Active interactions and promotional content on social media enhance digital experiences and customer satisfaction, which then lead to purchase decisions and loyalty. Customers who are satisfied with social media interactions feel closer to the brand and more engaged, which drives them to make purchases and continue choosing the brand's digital offerings. Satisfaction mediation shows that a social media strategy relying solely on activity frequency without quality interaction is not enough to change economic behavior. That Social Media Marketing Activities (SMMA) and customer experience significantly affect relationship quality, which positively influences customer behavior such as purchase intention, loyalty intention, and participation intention [65].

Showed that online delivery services and social media marketing positively affect customer satisfaction at Upnormal Store in Jatinangor, Sumedang. Using a case study approach with food consumers as respondents, the study found that convenient delivery access and effective interaction and promotion through social media improved consumers' positive perceptions of the services provided [66]. The study finds that social media influences consumer economic behavior indirectly through customer satisfaction. This supports the Customer Experience Framework, which suggests that customer experience quality encompassing interaction, emotional engagement, and informational value shapes

satisfaction and drives loyalty intentions. Social media thus serves not only as a promotional channel but also as a relational platform that fosters emotional bonds and strengthens brand attachment through continuous engagement.

The mediating role of satisfaction implies that mere frequency of social media activity is insufficient to change behavior without meaningful interaction quality. According to the Uses and Gratification Theory (UGT), consumers engage with media to fulfill specific psychological gratifications, such as entertainment, connection, and information. When social media content meets these needs, consumers report higher satisfaction, which translates into increased purchase intention, loyalty, and advocacy behavior. This finding is who showed that Social Media Marketing Activities (SMMA) and customer experience significantly influence relationship quality and behavioral outcomes such as purchase intention and loyalty [65]. Similarly, found that perceived service quality in mobile social media contexts including design, convenience, and privacy positively affects satisfaction, which then enhances loyalty [46]. Moreover, revealed that online delivery services and social media marketing significantly improve customer satisfaction and positive perceptions among food consumers in Indonesia. Empirically, these findings validate that customer satisfaction bridges the relationship between social media activity and consumer behavior in MSMEs demonstrating that interactive, engaging, and relational social media strategies are critical for fostering digital economic engagement and loyalty [66].

In the MSME context, this mediating relationship is particularly important. Unlike large corporations that can rely on mass advertising, MSMEs benefit most from personalized, interactive, and relational marketing through social media. When MSMEs build meaningful conversations and engage with their customers authentically, they generate satisfaction that encourages repeat purchases and loyalty. This creates a *relationship loop* engagement leads to satisfaction, satisfaction leads to loyalty, and loyalty strengthens long-term economic performance. Strategically, this implies that MSMEs should not merely increase the volume of their social media activity but must focus on improving interaction quality through timely responses, emotionally engaging storytelling, and valuable content.

Satisfaction acts as a behavioral amplifier, converting digital interactions into measurable economic actions such as repeat buying, advocacy, and long-term retention. This finding reinforces the centrality of satisfaction as a mediating variable that transforms digital engagement into tangible business outcomes.

This study provides important theoretical contributions by strengthening the integration between digital marketing and consumer behavior theories in the context of MSMEs. First, the findings expand the Technology Acceptance Model (TAM) and Expectation Confirmation Theory (ECT) by confirming that customer satisfaction plays a mediating role in translating digital marketing activities such as AI-based marketing, chatbots, and social media into consumer economic behavior. Second, the results reinforce the principles of behavioral economics, which emphasize that consumer decisions are influenced not only by rational factors but also by emotional and experiential components. In this study, satisfaction acts as a psychological bridge that connects technological interactions with real economic actions, such as repeat purchases and loyalty. Third, by focusing on MSMEs in Jambi, this research contributes to filling the empirical gap in developing economies, which have been underrepresented in previous studies on AI marketing and consumer behavior.

The findings of this research offer practical insights for MSME owners, marketing practitioners, and policymakers. First, MSME owners are encouraged to adopt simple but effective AI-based marketing strategies, such as personalized promotions and automated recommendations, to strengthen customer engagement. Second, implementing chatbots can help improve customer service quality by providing fast, accurate, and interactive responses, which lead to higher satisfaction and loyalty. Third, strengthening social media activities through frequent interactions, engaging content, and responsive communication can build stronger emotional connections with customers. Finally, local governments and business associations can play a supporting role by providing training and infrastructure to accelerate MSMEs' digital transformation. A well-designed digital marketing strategy can significantly improve competitiveness and long-term sustainability in the MSME sector.

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Although this study provides meaningful contributions, it has several limitations that should be acknowledged. First, the research is geographically limited to Jambi Province, which may affect the generalizability of the results to other regions. Second, the data were collected using self-reported questionnaires, which may not fully capture actual consumer behavior. Third, this study focuses only on three digital marketing variables (AI-based marketing, chatbots, and social media), while other factors such as digital literacy, trust, and cultural influences were not examined. These limitations provide valuable opportunities for further research.

Conclusion

Based on the results of hypothesis testing presented in Table 4 and Table 5, this study concludes that all variables examined AI-based marketing, chatbots, and social media have a positive and significant effect on customer satisfaction and consumer economic behavior. Digital marketing technologies, particularly those powered by artificial intelligence, have been shown to enhance marketing efficiency, personalization, and responsiveness. These improvements result in more relevant and meaningful interactions between businesses and consumers, which ultimately strengthen customer satisfaction and digital engagement. Furthermore, customer satisfaction has a direct and significant influence on consumer economic behavior. Satisfied customers tend to demonstrate consistent digital consumption patterns, stronger purchase intentions, and higher loyalty to digital products and services. This aligns with behavioral economics, which emphasizes that emotional satisfaction acts as a psychological driver, transforming rational decision-making into sustainable economic action. In the MSME context, this translates into stronger customer retention, increased repeat purchases, positive word-of-mouth, and expanded participation in digital marketplaces.

Additionally, the findings confirm that customer satisfaction mediates the relationship between AI-based marketing, chatbots, and social media with consumer economic behavior. This indicates that digital technologies do not directly trigger economic

actions but rather operate through the enhancement of customer experience and satisfaction. When consumers perceive digital platforms as useful, convenient, and emotionally engaging, their satisfaction rises, ultimately strengthening their purchasing and loyalty behaviors. Satisfaction therefore functions as a crucial psychological bridge linking digital innovation to economic impact. Theoretically, this study enriches the understanding of digital marketing and consumer behavior by extending the Technology Acceptance Model (TAM) and Expectation Confirmation Theory (ECT) to the MSME context. It emphasizes the mediating role of satisfaction as a key construct that connects technological adoption with behavioral outcomes. This also contributes to the growing literature on AI marketing in emerging markets by providing empirical evidence from Jambi Province, Indonesia. Practically, the findings offer strategic insights for micro, small, and medium enterprises (MSMEs). Business owners are encouraged to leverage AI-driven personalization, interactive chatbot systems, and active social media engagement not merely as technological tools but as mechanisms to build trust, satisfaction, and emotional connection with their customers. By focusing on customer satisfaction, MSMEs can create sustainable competitive advantages and stimulate long-term digital consumer engagement.

Future research can expand this study by examining different regions or countries to enhance generalizability. Longitudinal or experimental designs can also be used to capture changes in consumer behavior over time. Incorporating variables such as trust, digital literacy, or perceived value may deepen the understanding of behavioral dynamics in digital marketing contexts. Furthermore, qualitative methods such as interviews or focus group discussions can provide richer insights into customer experiences with AI, chatbots, and social media in MSMEs. The finding that customer satisfaction mediates the relationships among AI-based marketing, chatbots, social media engagement, and consumer economic behavior suggests that MSMEs should prioritize customer satisfaction as the central focus of their digital marketing strategy. Rather than viewing AI tools, chatbots, or social media activities as isolated efforts, MSMEs should use these technologies strategically to enhance customer experience, trust, and perceived value. Practically, MSMEs can leverage AI-based marketing to personalize offers and content

according to customer preferences, thus creating more relevant and satisfying experiences. Chatbots can be optimized not only for faster response times but also for empathetic and helpful communication that strengthens customer relationships. Likewise, consistent and engaging social media interactions can be used to build communities around the brand, fostering emotional attachment and loyalty. By continuously monitoring customer feedback and satisfaction levels, MSMEs can refine their marketing efforts, leading to stronger consumer loyalty and improved economic outcomes such as repeat purchases and positive word of mouth.

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