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The Influence Of AI-Based Marketing On Personalization And Automation Effectiveness In Digital Marketing Strategies: A Case Study Of Facebook Marketplace

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ABSTRAC

This study investigates the impact of artificial intelligence (AI)-based marketing on the effectiveness of personalization and automation within digital marketing strategies, with a specific focus on Facebook Marketplace. As the use of AI technologies in targeted marketing efforts continues to grow, understanding their role in enhancing user experience and marketing efficiency becomes increasingly important. Employing a quantitative case study approach with a sample of 200 respondents, this research utilizes SEM-Smart PLS as the analytical tool. It explores how AI tools implemented by Facebook Marketplace—such as algorithm-driven product recommendations, automated customer interactions, and dynamic ad placements—contribute to more personalized consumer experiences and more efficient marketing operations. Data were collected from marketing professionals and users through interviews and surveys, providing insights into perceived benefits and challenges. The findings indicate that AI significantly enhances both personalization and automation, resulting in higher engagement rates and improved conversion efficiency. However, concerns related to data privacy and algorithm transparency remain prevalent. The study concludes with recommendations for marketers aiming to optimize digital strategies through AI while upholding ethical standards and maintaining user trust.

1. Introductions

The digital transformation of the business landscape has profoundly reshaped marketing strategies. The digital era has not only shifted communication channels from physical to electronic media but also introduced disruptive technologies like Artificial Intelligence (AI), which now serves as the backbone of many modern marketing strategies (Agit & Muharram, 2024; Ainna Khansa & Tata Sutabri, 2024; Paizal et al., n.d.). AI-driven marketing leverages machine learning algorithms, natural language processing, and predictive analytics to understand consumer behavior, automate marketing processes, and deliver highly personalized and relevant experiences. As a result, AI has evolved into a strategic tool that enhances operational efficiency

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while significantly improving consumer value and engagement. A key concept in modern digital marketing is *personalization*—the ability of brands or platforms to tailor content, offers, and recommendations to individual users based on their interests, purchase history, and browsing behavior. AI plays a pivotal role in enabling real-time, automated personalization with an accuracy far surpassing manual approaches. Studies by Fathoni & Mohyi (n.d.), Aulia (2024), and Aditya Nirwana et al. (2023) reveal that AI-driven personalization can boost conversion rates by up to 30% compared to non-personalized strategies. However, overly aggressive personalization without transparency may raise privacy concerns among consumers, necessitating a balanced approach that integrates ethical considerations and regulatory compliance.

Another critical factor is the effectiveness of *automation* in digital marketing. Automation refers to systems performing marketing functions—such as email campaigns, social media scheduling, and customer inquiries—without direct human intervention. According to Kuswinanti et al. (2021), Lengga Satrya Sandy & Jhon Veri (2025), and Rhoyhan Budi Satrio et al. (2024), AI enhances these capabilities by enabling adaptive, data-responsive automation. However, Bakar (n.d.), Mulyani & Zevender (n.d.), and Susanti (2024) emphasize that automation's success hinges on data quality, contextual AI understanding, and seamless integration with business communication strategies. Some studies also highlight consumer ambivalence toward automation that lacks a "human touch," particularly in customer service interactions.

As a growing feature within Meta's ecosystem, Facebook Marketplace has emerged as a popular e-commerce platform, particularly in developing regions like Lampung, Indonesia. It enables individuals and MSMEs (Micro, Small, and Medium Enterprises) to market products without needing standalone websites (Abbas et al., n.d.; Annisa et al., 2024). AI-powered features—such as location-based product recommendations, automated notifications, and instant Messenger replies—demonstrate how AI contributes to micro-level marketing efficiency (Rupianti, n.d.; Putri, 2025). In regions like Lampung, where MSMEs are growing rapidly but digital literacy remains uneven, accessible platforms like Facebook Marketplace offer a promising solution.

Despite existing research, a *theoretical and empirical gap* persists in understanding AI's tangible impact on digital marketing in local contexts like Lampung. Studies by Fahmi (2024), Aditya Nirwana et al. (2023), and Alam et al. (2025) largely focus on AI's role in large-scale corporate digital transformation, with limited attention to informal or small-scale sectors. Additionally, empirical gaps exist in user-experience data, particularly regarding how local businesses and consumers perceive AI in Facebook Marketplace strategies (Kuswinanti et al., 2021; Debora Oktaviani et al., 2024).

The interplay between *AI-based marketing, personalization, and automation* is not merely conceptual but mutually reinforcing in practice (Putri, 2025; Chaidir & Irawan, 2024). AI serves as the technological foundation for simultaneous personalization and automation (Syafira & Dewi, 2025; Tampubolon et al., 2024). While personalization enhances user relevance and

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engagement, automation accelerates processes and ensures communication consistency (Syaka et al., n.d.; Paizal et al., n.d.). Thus, researching AI's influence on these variables—particularly on platforms like Facebook Marketplace—is vital for understanding how local businesses in regions like Lampung can optimize this technology effectively. Against this backdrop, this study aims to explore and analyze the impact of AI-driven marketing on personalization and automation effectiveness in digital strategies, with a focus on Facebook Marketplace in Lampung. The findings are expected to contribute *theoretically* to digital marketing literature and *practically* by empowering local businesses to develop adaptive, sustainable technology-based strategies.

2. Literature Review and Hypothesis

2.1. AI-Based Marketing Variable

AI-Based Marketing is a marketing approach that uses Artificial Intelligence (AI) technology to automate, analyze, personalize, and optimize various marketing activities. AI is used to process customer data, understand behavior, predict trends, and deliver more relevant and efficient customer experiences. (Abbas et al., n.d.; Annisa et al., 2024).

Indicators of AI-Based Marketing Here are several indicators that show the success or implementation of AI in marketing:

1. Content Personalization
   The ability of AI to deliver relevant content to each individual based on historical data, interests, and online behavior.
2. Marketing Automation
   The use of automated systems to send emails, schedule social media content, or run advertising campaigns without manual intervention.
3. Consumer Analysis and Prediction
   AI's ability to predict consumer behavior, such as purchase likelihood, churn, or responses to certain campaigns.
4. Digital Ad Optimization
   AI is used to determine the right audience, best timing, and most suitable platform to display ads.
5. AI-Based Customer Engagement
   The use of chatbots or virtual assistants to enhance customer interaction quickly and efficiently.
6. Increased Marketing ROI (Return on Investment)
   The positive impact of AI implementation on cost efficiency, sales conversion, and marketing return on investment.
7. Real-Time Decision Making
   AI can make instant recommendations or decisions based on data collected in real-time.

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8. Better Customer Experience
   AI helps create a smoother, more responsive, and relevant customer journey.

2.2. Customer Experience Personalization Variable

Customer Experience Personalization is the process of tailoring interactions, services, and content delivered to customers based on their personal data, behavior, and preferences, with the goal of increasing satisfaction, loyalty, and engagement. (Syafira & Dewi, 2025; Tampubolon et al., 2024).

Indicators of Customer Experience Personalization. To assess the success of customer experience personalization, here are some key indicators:

1. Content Relevance
   The extent to which content, offers, or recommendations align with the customer's needs or interests.
2. Customer Satisfaction (CSAT)
   Customers feel the experience is pleasant and meets their expectations.
3. Increased Loyalty and Retention
   Customers return more often and continue using the service/product because they feel personally valued.
4. Customer Engagement
   Interaction with platforms, apps, or campaigns increases because the content feels relevant.
5. Higher Conversion Rates
   Customers who receive personalized experiences are more likely to make purchase decisions.
6. Net Promoter Score (NPS)
   A measure of customer loyalty based on their likelihood to recommend the brand to others.
7. Efficiency in the Customer Journey
   The customer experience becomes more streamlined and quicker because they are directed straight to what's relevant.

2.3. Effectiveness of Marketing Automation on Facebook Marketplace

Kuswinanti et al. (2021), Lengga Satrya Sandy & Jhon Veri (2025). The effectiveness of marketing automation on Facebook Marketplace refers to the extent to which the use of automation tools (such as chatbots, auto-replies, dynamic ads, CRM integration, etc.) helps sellers or businesses on the platform to: ,Attract potential buyers, Speed up response to inquiries, Increase conversions (sales). Indicators of Marketing Automation Effectiveness on Facebook Marketplace

1. Faster Customer Response (Response Time)
   Average time for automatic responses to potential buyers (via chatbot or auto-reply)

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2. Listing Conversion Rate Number of messages or transactions compared to product views
3. Number of Automated Interactions How many interactions were handled by the automated system (not manually)
4. Sales Growth Increase in number or value of transactions after implementing automation
5. Click-Through Rate (CTR) from Dynamic Ads
   The ratio of clicks from ads to product pages
6. Number of Leads Generated
   Number of potential buyers who contacted via Messenger after viewing an ad/listing
7. Operational Efficiency (Time Saved)
   Reduction in time needed to perform marketing/manual tasks

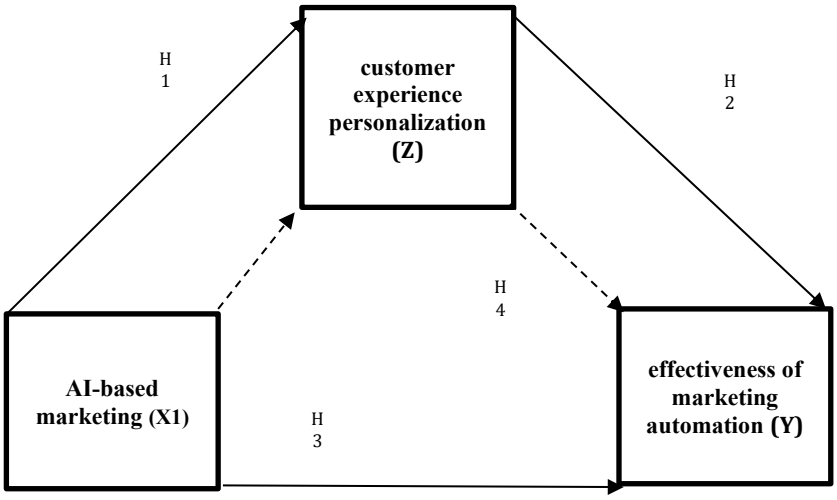
Hypothesis :

H1: AI-based marketing has a positive effect on the level of customer experience personalization in Facebook Marketplace.

H2: AI-based marketing has a positive effect on the effectiveness of marketing automation in Facebook Marketplace.

H3: Customer experience personalization has a positive effect on the effectiveness of marketing automation in Facebook Marketplace.

H4: AI-based marketing has an indirect effect on the effectiveness of marketing automation through customer experience personalization.



Pictures 1. Conceptual Framework

3. Research Methods

To systematically address the hypotheses in this study, a descriptive quantitative approach with an explanatory survey method was used. This design was chosen because it is suitable for

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examining the effect of one variable on another measurably and objectively. Quantitative research allows the researcher to collect numerical data from respondents, process it statistically, and draw conclusions based on empirical evidence. In this context, the explanatory approach is used to understand the influence of AI-based marketing on personalization and the effectiveness of automation in digital marketing strategies, using a case study of Facebook Marketplace users in the Lampung region. The subjects of this research are individuals or micro, small, and medium enterprise (MSME) actors who actively use Facebook Marketplace as a tool for marketing and selling their products.

The research area focuses on Lampung Province, particularly cities with high levels of digital economic activity such as Bandar Lampung, Metro, and surrounding areas. Respondent criteria include: (1) Facebook Marketplace users who have been selling for at least the past six months, (2) users who actively utilize digital marketing features such as advertisements, automated messages, or product recommendations, and (3) users who have direct experience in using the automation and personalization features available on the platform. (Sugiyono. 2016,). The sampling technique used is purposive sampling, as not all Facebook Marketplace users are relevant to the variables being studied. The sample size is determined using Slovin's formula: $\mathbf{n}=\frac{9.419.580}{1+.9.419.580(e)2}=\mathbf{200}$ This calculation is based on the population of active marketplace users in the region, using a margin of error of 5%.

To collect data, the researcher used a structured questionnaire as the primary instrument. The questionnaire was designed using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) to measure respondents' perceptions of the three main variables: AI-based marketing, level of personalization, and automation effectiveness. The questions include aspects such as the use of product recommendation features, automated messaging (chatbots), targeted advertising, user comfort with personalized content, and the efficiency of the sales process through automation features. As a complement to the quantitative data, the researcher also conducted semi-structured interviews with selected MSME actors to gain a deeper understanding of the real challenges and benefits of implementing AI in their marketing activities. After the data was collected, the next step was data analysis.

The analysis was carried out in stages. First, descriptive statistical analysis was conducted to describe the characteristics of respondents and the trends in their responses to each variable indicator. Second, Structural Equation Modeling with Partial Least Squares (SEM-PLS) was used to examine the influence of the independent variable (AI-based marketing) on the dependent variables (personalization and automation effectiveness). Data processing was assisted by statistical software such as SmartPLS. Before hypothesis testing, validity and reliability tests were conducted on the research instruments to ensure the data collected was suitable for further analysis.

4. Results and Discussion

This study will employ descriptive analysis methods to comprehensively identify respondent profiles. This approach enables researchers to provide detailed explanations of various relevant characteristics of the research subjects.

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Table 1 Descriptive Date Analysis

Category	Subcategory	Frequency (n)	Percentage (%)
Gender	Male	90	45%
	Female	110	55%
	Total	**200**	**100%**
Age Group	<20 years	30	15%
	20-29 years	80	40%
	30-39 years	60	30%
	≥40 years	30	15%
	Total	**200**	**100%**
Education Level	Elementary School/equivalent	20	10%
	Junior High School/equivalent	30	15%
	Senior High School/equivalent	80	40%
	Diploma/Associate Degree (D1-D3)	30	15%
	Bachelor's Degree (S1)	35	17.5%
	Postgraduate Degree (S2/S3)	5	2.5%
	Total	**200**	**100%**
Usage Duration/Day	<1 hour	40	20%
	1-3 hours	90	45%
	4-6 hours	50	25%
	>6 hours	20	10%
	Total	**200**	**100%**
Usage Purpose	Product shopping	120	60%
	Selling products	50	25%
	Product information search	20	10%
	Other purposes	10	5%
	Total	**200**	**100%**
Monthly Spending	Low (<IDR 500k)	100	50%
	Medium (500k-1M)	60	30%
	High (>IDR 1M)	40	20%
	Overall average	200	100%

Source: Processed data (2025)

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The platform is slightly more popular among women (55%) than men (45%). The user base is predominantly young, with 70% aged 20-39, suggesting Marketplace appeals most to digital-native millennials. Education levels show 40% completed high school, while 20% have higher education (bachelor's or postgraduate degrees). indicate most users engage moderately: 45% spend 1-3 hours daily on Marketplace, while only 10% are heavy users (>6 hours). The platform serves dual purposes—60% primarily shop for products, while 25% use it to sell items, reflecting its role as both an e-commerce and side-income platform. shows polarized spending: 50% are light spenders (<IDR 500k/month), but 20% are high-value customers (>IDR 1M/month). The average monthly expenditure is IDR 675k, indicating decent monetization potential. Facebook Marketplace succeeds as a versatile platform for young Indonesians, particularly women aged 20-39, balancing casual shopping with entrepreneurial selling opportunities. Businesses should target the active 20-29 age group while developing premium features for high-spending users. The data suggests optimizing mobile experience would benefit the predominantly high-school educated user base.

Table 2 Validity and Reliability Test

Variable	Code	Outer Loading	Cronbach's Alpha	Average Variance Extracted (Ave)	Informations
AI-based marketing	X1.1	0.802	0.863	0.554	valid and reliabel
	X1.2	0.873			valid and reliabel
	X1.3	0.776			valid and reliabel
	X1.4	0.749			valid and reliabel
	X1.5	0.709			valid and reliabel
	X1.6	0.619			valid and reliabel
	X1.8	0.654			valid and reliabel
effectiveness of marketing automation (Y)	Y.1	0.767	0.771	0.566	valid and reliabel
	Y.2	0.766			valid and reliabel
	Y.5	0.753			valid and reliabel
	Y.7	0.721			valid and reliabel
customer experience personalization	Z.2	0.878	0.798	0.711	valid and reliabel
	Z.3	0.765			valid and reliabel
	Z.4	0.881			valid and reliabel

Source: Smart Pls.3.2025.

This analysis evaluates three critical marketing technology dimensions through rigorous validity and reliability testing. The results demonstrate strong psychometric properties across all constructs, confirming their suitability for advanced statistical modeling. AI-Based Marketing (X1) emerges as a robust construct with excellent internal consistency (α=0.863). The outer loadings range from 0.619 to 0.873, with X1.2 showing particularly strong representation. While all indicators meet validity thresholds, X1.6 (0.619) and X1.8 (0.654) could benefit from

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potential refinement to strengthen the measurement model further. Marketing Automation Effectiveness (Y) demonstrates solid reliability (α=0.771) with consistently high loadings (0.721-0.767). The AVE of 0.566 confirms adequate discriminant validity, suggesting the scale effectively captures this dimension of marketing technology performance. Customer Experience Personalization (Z) stands out as the strongest construct, boasting both high reliability (α=0.798) and exceptional convergent validity (AVE=0.711). The remarkably high loadings (0.765-0.881) indicate these items perfectly capture the personalization concept.

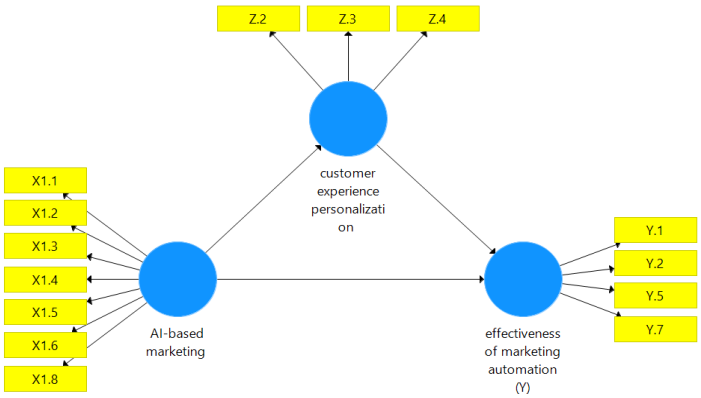
Table 3 R-square and adjusted-square

Informations	R Square	R Square Adjusted
Customer experience personalization	0.427	0.424
Effectiveness of marketing automation (Y)	0.283	0.276

Source: Smart Pls.3.2025.

Based on the analysis results presented, the R Square value for the variable *customer experience personalization* is 0.427, while for the variable *effectiveness of marketing automation*, it is 0.283. The R Square value indicates the proportion of variability in the dependent variable that can be explained by the independent variables in the research model. This means that 42.7% of the variability in customer experience personalization can be explained by the independent variables included in the model. According to Hair et al. (2011), this value falls into the category, indicating that the model has a fairly good explanatory power for this variable. Meanwhile, the R Square value of 0.283 for the effectiveness of marketing automation suggests that only 28.3% of its variability is explained by the model. This is considered, but still acceptable within the context of social and behavioral research, especially when the model is exploratory in nature.

After completing the measurement model analysis, this study proceeds with hypothesis testing using the structural model. To evaluate the relationships between variables, the path coefficient analysis method was employed. The findings reveal that all tested paths have a statistically significant influence. Therefore, hypotheses H1 to H4 can be accepted as they are supported by the empirical evidence gathered.



Pictures 2 Structural Equations Model (SEM)

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Path analysis was performed to evaluate the influence of independent variables on the dependent variable by examining the relationships and effect sizes between exogenous and endogenous variables

Table 4 Path Analysis Test

Variables	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	Informations
AI-based marketing -> customer experience personalization	0.653	0.661	0.041	16.127	0.000	Accepted
AI-based marketing -> effectiveness of marketing automation (Y)	0.432	0.441	0.078	5.534	0.000	Accepted
customer experience personalization -> effectiveness of marketing automation (Y)	0.237	0.241	2.085	2.618	0.000	Accepted
AI-based marketing -> customer experience personalization -> effectiveness of marketing automation (Y)	0.289	0.293	2.057	2.570	0.000	Accepted

Source: Smart Pls.3.2025.

AI-BASED MARKETING -> CUSTOMER EXPERIENCE PERSONALIZATION

The influence is very strong and significant (Ts=16.127) > T-table 1.96. This means AI technologies like product recommendations and data analytics effectively enhance companies' ability to deliver personalized customer experiences.

AI-BASED MARKETING -> EFFECTIVENESS OF MARKETING AUTOMATION

A moderately strong direct influence (Ts=5.534) > T-table 1.96. This indicates that AI improves marketing automation performance through enhanced segmentation, campaign scheduling, and customer behavior prediction.

CUSTOMER EXPERIENCE PERSONALIZATION -> EFFECTIVENESS OF MARKETING AUTOMATION

Although smaller, this relationship remains significant (Ts=2.618) > T-table 1.96. The implication is that personalization contributes to automation success, but isn't the sole determining factor.

AI-BASED MARKETING -> CUSTOMER EXPERIENCE PERSONALIZATION -> EFFECTIVENESS OF MARKETING AUTOMATION

Personalization acts as a partial mediator (Ts=2.57) > T-table 1.96, proving that AI impacts automation not only directly but also through improving personalized customer experiences.

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DISCUSSION

The strongest relationship exists between AI-based marketing and customer experience personalization (path coefficient = 0.653, Ts = 16.127). This very strong and statistically significant connection ($p < 0.05$) indicates that AI technologies fundamentally transform how companies deliver personalized experiences. Machine learning algorithms analyze vast amounts of customer data to generate tailored product recommendations, while natural language processing enables more human-like interactions through chatbots. Predictive analytics allow marketers to anticipate customer needs before they arise. These AI capabilities collectively create a more relevant and engaging experience for each individual customer.(Aditya Nirwana dkk., 2023; Agit & Muharram, 2024; Alam dkk., 2025a; Kuswinanti dkk., 2021)

AI-Based marketing also shows a direct, moderately strong influence on marketing automation effectiveness (0.432, Ts = 5.534). This relationship highlights how AI enhances various aspects of marketing automation. Intelligent segmentation algorithms can categorize customers with unprecedented precision based on their behavior patterns. AI-powered scheduling tools determine optimal times to send communications for maximum engagement. Perhaps most significantly, predictive modeling enables automation systems to anticipate which customers are most likely to convert or churn, allowing for proactive intervention.(Aditya Nirwana dkk., 2023; Alam dkk., 2025b; Syaka dkk., t.t.)

Customer experience personalization and marketing automation effectiveness remains statistically significant (0.237, Ts = 2.618). This suggests that personalized experiences contribute to automation success by increasing customer responsiveness to automated communications. When messages are highly relevant to individual recipients, they generate better engagement metrics and conversion rates. However, the relatively smaller coefficient indicates that personalization is just one of several factors influencing automation effectiveness.

The mediation analysis reveals an important indirect effect (0.289, Ts = 2.57), where customer experience personalization partially mediates the relationship between AI-based marketing and automation effectiveness. This means AI improves automation performance through two distinct pathways: directly through technological enhancements to automation systems, and indirectly by enabling more personalized customer experiences that respond better to automated marketing efforts.(Alam dkk., 2025a; Aulia, 2024; Nasution, 2022; Nita & Ahmadi, 2024; Pratama dkk., t.t.; Pratama & Manan, t.t.)

These findings have significant practical implications. First, they suggest companies should prioritize AI adoption as a dual-purpose tool that enhances both personalization and automation capabilities. Second, the results indicate that the most effective marketing strategies will integrate AI, personalization, and automation in a coordinated approach rather than treating them as separate initiatives. Finally, the partial mediation effect underscores the importance of viewing customer experience improvement as an integral part of marketing technology implementation, not just an optional enhancement.(Fathoni & Mohyi, t.t.; Syaka dkk., t.t.)

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5. Conclusion and Suggestions

This analysis reveals the transformational role of AI in modern marketing through three key relationships. First, AI-based marketing demonstrates an exceptionally strong influence (Ts=16.127) on customer experience personalization, proving how machine learning and data analytics enable highly personalized interactions. Second, AI directly enhances marketing automation effectiveness (Ts=5.534) through intelligent segmentation and predictive scheduling. Third, although personalization's impact on automation is smaller (Ts=2.618), it remains statistically significant. Most importantly, the mediation analysis (Ts=2.57) confirms that AI improves automation through dual pathways - both directly and indirectly via personalization - uncovering a dual-value creation mechanism where AI simultaneously optimizes operational systems and customer interactions.

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