Electronic Journal of Business and Management
Vol. 10, Issue 3, 2025, pp. 01-14
e-ISSN:2550-1380-ISSN
doi: https://doi.org/10.65136/ejbm.v10i3.16

Exploring How AI, Machine Learning, and Social Media Data Impact Digital Marketing and Consumer Behavior.

Lazim Istiak [1], Ahmed Imran Kabir [1*], Abdullah Al Fahad [1], Jayanta Sarker [1], Yeana Anmol Queeney [1], Zaheeb Jowad Kazi [1]

[1] School of Business and Economics, United International University, United City, Dhaka 1212, Bangladesh
[*]Corresponding Author: ahmedimran@bus.uiu.ac.bd

Abstract

This study investigates the transformative role of artificial intelligence (AI) in digital marketing, focusing on its function as a mediating variable that enhances marketing strategies. AI technologies, including predictive analytics and machine learning, enable businesses to deliver personalized user experiences, streamline processes, and gain actionable insights into consumer behavior. The research examines AI's impact on targeted advertising, consumer behavior, and social media mining, emphasizing its ability to optimize outcomes in digital marketing. A survey of marketing professionals reveals that while direct relationships between consumer behavior, machine learning algorithms, and social media mining with digital marketing are limited, AI significantly enhances their combined effectiveness. By automating tasks, analyzing large datasets, and delivering precision-driven marketing, AI fosters deeper consumer engagement and more resonant campaigns. Despite its contributions, the study acknowledges limitations, including a focus on quantitative data and a restricted sample size, suggesting the need for future research to explore qualitative insights, ethical considerations, and the long-term implications of AI in marketing.

Keywords: *Artificial Intelligence, Digital Marketing, Machine Learning Algorithms, Social Media Mining, Consumer Behavior, Personalized Marketing.*

1. Introduction

In the fast-paced nature of modern business environments, the adaption of technology and its synergy with marketing has become increasingly noticeable and led to several useful developments in the realm of digital marketing. Digital marketing is an umbrella term which consists of aspects such as targeted advertising, social media engagement and content marketing. Artificial Intelligence has the capacity to completely transform how businesses engage with their target audience, through the help of predictive analytics and customized user experiences. This symbolic relationship prompts a highly asked question in our minds, "In what ways can Artificial Intelligence technologies be leveraged to further improve the effectiveness of digital marketing strategies?"

Artificial Intelligence is empowering businesses to deliver highly tailored customer insights and streamline routine tasks which result in personalized experiences and more resonant marketing campaigns. Through the help of AI-driven approaches, organizations are able to gain deeper insights into their clientele's behavior, preferences, and requirements.

When combined with the vast potential prevalent in the market, the subject of Artificial intelligence-driven marketing has gained escalating significance, drawing attention from research around the globe. The swift progress of Artificial Intelligence technology, such as Chat-GPT and Google Bard, alongside the evolving landscape of digital marketing, emphasizes the importance of regularly refining our understanding of their substantial interconnection.

In this paper, we will see how Artificial Intelligence has diffused its way through every facet of the digital marketing ecosystem, redefining strategies, enhancing the efficiency of the efforts of marketing, and revolutionizing how customers view Artificial Intelligence. The subsequent sections are outlined to provide a thorough explanation of all the elements we have chosen and their relationship with digital marketing, portraying how it plays a part in effectiveness. Our comprehensive analysis is crucial for both professionals and academics to fully understand the extensive possibilities that Artificial Intelligence has to offer in this field.

The objective of this study is to investigate the impact of artificial intelligence on digital marketing tactics and outcomes, with a specific focus on Artificial Intelligence as a mediating variable. The study aims to investigate how Artificial Intelligence technologies influence various aspects of digital marketing such as targeted advertising and overall success of digital marketing campaigns. By exploring the mediating role of Artificial Intelligence, this study aims to understand how Artificial Intelligence-driven insights and automation can help enhance digital marketing practices.

We aimed to identify artificial intelligence's impact on digital marketing in the advanced world. The research questions are as follows:

RQ1: "I trust AI to deliver relevant and useful content compared to traditional marketing methods." - how do you feel about this statement?

RQ2: "I am concerned about the potential for AI to be biased in its marketing recommendations." - how do you feel about this statement?

RQ3: People are concerned about AI replacing human marketing jobs. Do you think AI will create more marketing job opportunities than the ones it takes away?

Reading through relevant literature helped develop the hypotheses. Subsequently, a research process comprises project design, data collection, and analysis. The demographic characteristics of the respondent, discriminant validity, model assessment measurement, structural model evaluation, and hypothesis testing are all included in the findings, which are then thoroughly examined.

2. Literature Review

2.1. Artificial Intelligence

Artificial Intelligence (AI) is a field of computer science aimed at giving machines intelligence that mimics that of a human being. The idea of AI is to create systems capable of executing operations that typically require human intervention, such as identifying objects in an image or solving a math problem (Ziakis & Vlachopoulou, 2023). In digital marketing, AI is transforming the landscape. With 84 percent of marketers adopting AI technologies, it is being used in various ways, such as creating customer profiles and forecasting the demand for specific products (Yadav & Pandita, 2024)Studies suggest that machine learning and AI increase customer satisfaction by almost 10% (Yin & Qiu, 2021).

AI can analyze large data sets and identify patterns that humans might overlook, enhancing marketing insights and strategies. Personalization, a critical aspect of digital marketing, has also seen significant advancements with AI-powered recommendation agents and content curation tools aiding in delivering tailored experiences to consumers (Villegas-Ch, Erazo, Ortiz-Garces, Gaibor-Naranjo, & Palacios-

Pacheco, 2022). Furthermore, AI helps automate monotonous tasks, allowing marketers to focus on creative and strategic efforts (Rabby, Chimhundu, & Hassan, 2021).

2.2. Consumer Behavior

All the efforts of digital marketers in their campaigns focus on one goal: understanding and engaging their consumers and target audiences. Understanding how consumers interact with brands and products enables marketers to leverage AI technologies more effectively, thereby enhancing marketing strategies and outcomes (Chintalapati & Pandey, 2022) One significant challenge is processing and measuring the vast amount of data available to derive valuable insights while building consumer trust. AI addresses this challenge by managing and analyzing large data volumes in real time, automating service interactions, and tailoring customer experiences (Toader et al., 2019).

The evolution of AI in strategy and planning is closely tied to customer relationship management, which collects data about customer actions and preferences (Alqurashi et al., 2023). Sentiment analysis of online interactions reveals valuable insights into consumer behavior and preferences. For example, personalized recommendations and discounts tailored to consumer preferences significantly influence purchasing decisions (Murgai, 2018). Consumers' purchase intentions often hinge on the quality of information, such as product ratings, presented to them (Gundecha & Liu, 2012). Consumers increasingly research products or services before purchasing, highlighting the importance of digital touchpoints in decision-making (Bhuvaneswari et al., 2024). Trust in online reviews, especially those categorized as "positive" by sentiment analysis algorithms, further emphasizes AI's role in shaping consumer perceptions and behaviors (Bashang & Puttanna, 2023). These insights demonstrate the need for sophisticated AI tools to analyze and leverage customer data, driving enhancements in digital marketing strategies (Perakakis, Mastorakis, & Kopanakis, 2019).

Hypothesis 1 (H1): Consumer Behavior has a positive and significant relationship with the impact of Artificial Intelligence in Digital Marketing.

2.3. Machine Learning

Algorithms The integration of machine learning into digital marketing is transforming the industry, helping marketers simplify various digital marketing elements such as digital ad campaigns, content, and personalized recommendations (Huang & Rust, 2021). Positioned in the realm of artificial intelligence, machine learning encompasses systems and software applications that are engineered to "learn" through the analysis of large data sets (Trgovac, Mandić, & Marković, 2024). In marketing, machine learning typically entails utilizing software programs and other technological tools to swiftly analyze and derive valuable insights from these extensive data sets (Sukdeo & Mothilall, 2023).

The impact of AI in precision marketing and its role in delivering targeted and personalized marketing campaigns is significant (Miklosik, Kuchta, Evans, & Zak, 2019). The influence of AI technology on online shopping suggests that AI-driven insights into consumer behavior can noticeably enhance purchasing intentions (Yang, Li, Ni, & Li, 2021). Machine learning algorithms and extensive data processing provide marketing specialists with vital decision-making insights (Shevchyk, 2024).

From music and video streaming services suggesting content based on user preferences to targeted advertisements aligning with individual interests, machine learning algorithms have become integral in providing tailored experiences (Jiang, Cheng, Yang, & Gao, 2022)). Additionally, facial recognition technology and personalized recommendations on e-commerce websites underscore the transformative potential of machine learning in optimizing user interactions and driving engagement (Dandotiya, Gahlot Sarkar, & Sarkar, 2024).

Hypothesis 2 (H2): Machine Learning Algorithms have a positive and significant relationship with the impact of Artificial Intelligence in Digital Marketing.

2.4. Social Media

Mining Social media mining powered by Artificial Intelligence (AI) significantly impacts digital marketing by providing deeper and more precise targeting strategies (Liu, Gupta, & Patel, 2023). AI-driven social media mining involves extracting and analyzing data generated on platforms such as Facebook, Twitter, Instagram, and TikTok (Serey et al., 2021). This data encompasses user interactions, preferences, behavior, and connections, which are invaluable for marketers seeking to comprehend and engage their audience effectively (Haque, Akther, Khan, Agarwal, & Uddin, 2024).

The primary advantage of AI in this context is its ability to personalize user experiences and suggestions, a feature highly appreciated by consumers (Gupta & Khan, 2024). Personalized suggestions on social media enhance online experiences, making content more relevant and increasing engagement (Thaichon & Quach, 2023). By applying AI and sentiment analysis on data from Twitter, researchers have developed models to predict user personalities based on their activity (Juan, 2024).

AI-powered social media monitoring systems also provide extraordinary insights for brands to handle their online presence more effectively (White & Green, 2021). These tools are instrumental for social media marketers to learn important lessons about engaging potential target audiences (Rane, Choudhary, & Rane, 2024).The positive reception of personalized suggestions and the helpfulness of account recommendations highlight the transformative impact of AI in social media mining (Thamaraiselvi et al., 2024). With AI-powered analytics, social media marketers can boost conversion rates and improve sales (Theodorakopoulos & Theodoropoulou, 2024).

Hypothesis 3 (H3): Social Media Mining has a positive and significant relationship with the impact of Artificial Intelligence in Digital Marketing.

2.5 Digital Marketing

Digital marketing refers to any online marketing campaign that appears on technological devices such as phones or computers (Micu, Capatina, & Micu, 2018)These campaigns often take the form of online videos, social media ads, display ads, and social media posts (Khatri, 2021). As the world increasingly shifts towards online platforms, digital marketing plays a vital role in capturing consumers' attention (Ziakis & Vlachopoulou, 2023)Companies leverage electronic data processing and online communication to enhance their marketing efforts (Nandi & Subrahmanyan, 2024)

Real-time marketing, synonymous with digital marketing, is rising due to continuous changes in customer preferences (Alqurashi et al., 2023; Ebrahimi et al., 2022). Traditional marketing cannot compare to digital marketing's ability to deliver customized content and insight-driven interactions with customers (Kaponis & Maragoudakis, 2022). AI integration enhances digital marketing's capacity, providing businesses with a competitive edge that combines content and context effectively (Gkikas & Theodoridis, 2021).

Hypothesis 4 (H4): Digital Marketing is influenced by Consumer Behavior.
Hypothesis 5 (H5): Digital Marketing is influenced by Machine Learning Algorithms.
Hypothesis 6 (H6): Digital Marketing is influenced by Social Media Mining.

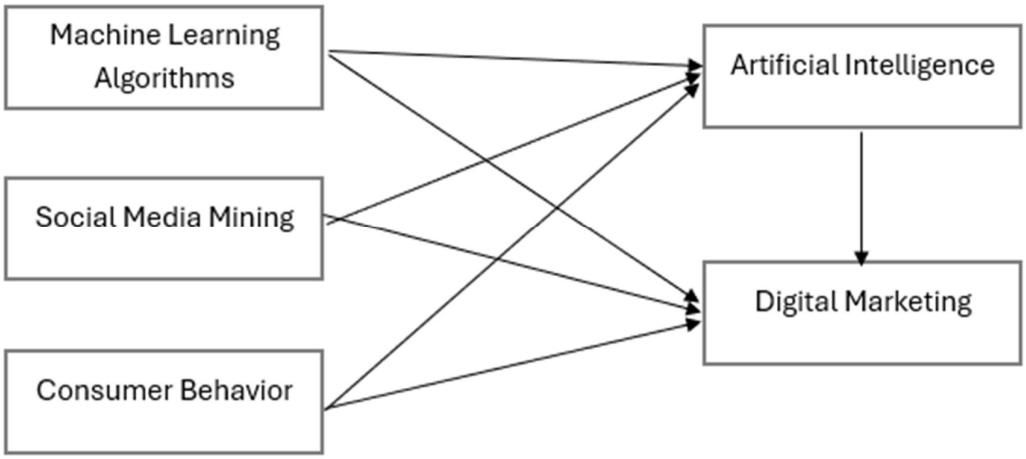

Figure 1. Conceptual Framework.

3. Methodology

3.1 Study Context

The impact of artificial intelligence in digital marketing is the main topic of this study. The future is being shaped by the convergence of technological advancements, including digital marketing. Marketers are discovering various strategies to reach their target audience by integrating technology, and to cap it all off; artificial intelligence has simplified the process by introducing several AI-based models. This study aims to determine the impact of artificial intelligence on digital marketing strategy.

3.2 Research and Questionnaire Design

The scientific approach followed in this study enables us to extract data-driven hypotheses from empirical knowledge. A comprehensive quantitative analysis was also carried out in this study to understand the impact of Artificial Intelligence in Digital Marketing. Experts in marketing and digital marketing were asked to share their perspectives and make insightful responses to the issues.

Google Forms was used to conduct the survey, and Likert scales ranging from strongly disagree (1) to strongly agree (5) were used to measure each question. The final survey has 24 questions and five variables. We have ensured that the questions are clear and concise and gather the data required to comprehend artificial intelligence's influence on digital marketing. The survey used five items concerning Machine Learning Algorithms, Artificial Intelligence, Digital Marketing, and Consumer Behavior. The impact of social media mining was assessed using four criteria.

3.3 Sampling and Data Collection

A sample of 125 valid and comprehensive responses was obtained from the participants. However, six of the respondents had to be removed from our sample because of their erroneous responses. A poll of 119 participants was used to test the findings of the research. Every individual has given permission to take part in the research. Additionally, we have explained to each respondent that their contributions will only be used for research purposes. There was moderate collinearity, as indicated by VIF values ranging from 1 to 5.

3.4 Data Analysis

A structural equation modeling, or SEM, evaluation was performed on the research model to ensure that it was correct. Testing the data analysis and study model's correctness, reliability, and smart pls 3.2.8 was possible. The minimum r-square method described helped us get the sample size we needed for SEM analysis. Therefore, the most accurate method of making predictions is PLS-SEM. It has the ability to

operate simultaneously with both data and structure models. It's also an effective approach for looking into extremely complex route models. For the first time, the PLS-SEM can handle very small sample amounts and still give very exact data. Because of this, PLS-SEM was a good tool for our research. The alpha coefficient and other statistical tests, like convergent validity and discriminant validity, were used to check the measurement and structure mode.

3.5 Mediation Analysis

This study used a two-step method to determine how artificial intelligence could impact Digital Marketing. The first step looked at the effects of consumer behavior, machine learning algorithms, and social media mining on Artificial Intelligence. The indirect effect of Consumer Behavior → Artificial Intelligence → Digital Marketing, Machine Learning Algorithms → Artificial Intelligence → Digital Marketing, and Social Media Mining → Artificial Intelligence → Digital Marketing was significant in this study. The researchers examined the effects on digital marketing for H1, H2, and H3 using consumer behavior, machine learning intelligence, and social media mining without removing the mediator (artificial intelligence).

4. Results

4.1. Respondent's Profile

Table 1 summarizes the distributions that follow in detail: The participants' demographic data is presented in this survey, which was conducted among young professionals in the marketing field. A young workforce was evident from the 119 successful responses, with the majority of responders (34.5%) being in the 21–25 age range. Regarding gender, roughly 52.9% of respondents are men, while the remaining are women. According to this demographic profile, the industry comprises young men with little work experience who have only a basic degree of higher education.

Table 1. Demographic profile of respondents.

Characteristics	**Frequency**	**(%)**
Age		
Under 20	9	7.6
21-25	41	34.5
26-30	37	31.1
31-40	24	20.2
Over 40	8	6.7
Gender		
Male	63	52.9
Female	56	47.1
Other	0	0

4.2 Model Measurement. Validity and Reliability

The review of the model is shown in Table 2. The outer loading is permitted over 0.05. The study's outer loading is more than 0.50, as Table 2 demonstrates. Should the total score for reliability be higher than 0.70, it is suggested that the reliability's internal consistency be checked. According to Table 3 indicates that the study's reliability is greater than or equal to 0.70. Table 2 shows that Cronbach's alpha is generally higher than 0.70, with the exception of one instance when the value is 0.628. The convergence validity was computed using the average variance extracted (AVE). For convergent validity to apply, both items must have loading factors that are greater than 0.50. AVE numbers higher than 0.50 are shown in Table 2.

Table 2. Measurement of model assessment.

Constructs	Items	Loading	AVE	CR	Alpha	R^2	NFI	SRMR
Artificial Intelligence (AI)	AI01	0.813	0.848	0.927	0.902	0.579	0.687	0.082
	AI02	0.855						
	AI03	0.879						
	AI04	0.847						
	AI05	0.844						
Consumer Behavior (CB)	CB01	0.768	0.792	0.894	0.851			
	CB02	0.834						
	CB03	0.811						
	CB04	0.809						
	CB05	0.737						
Digital Marketing (DM)	DM01	0.942	0.943	0.941	0.874	0.559		
	DM02	0.943						
Machine Learning Algorithms (MLA)	MLA01	0.840	0.855	0.843	0.628			
	MLA04	0.867						
Social Media Mining (SMM)	SMM01	0.765	0.808	0.883	0.823			
	SMM02	0.884						
	SMM03	0.867						
	SMM04	0.708						

Table 3. Values of the Stone-Geisser indicator(Q^2) and Cohen's indicator (f^2) of the model in the SEM.

Variables	Q2	Artificial Intelligence (f2)	Digital Marketing (f2)
Artificial Intelligence	0.547		0.330
Consumer Behavior	0.433	0.305	
Digital Marketing	0.509		
Machine Learning Algorithms	0.211	0.135	0.023
Social Media Mining	0.423	0.141	0.021
Large effect > 0.34; medium effect > 0.14; small effect > 0.01 (Cohen, 1988)			

Testing the model with R^2 values of 2%, 13%, and 26% shows that the R^2 value of Artificial Intelligence as a moderating variable is 0.579 which is moderately positive and indicates that approximately 57.9% of the variance in the dependent variable can be explained by the moderating variable. Additionally, the R^2 value of Digital Marketing is 0.559 which is also moderately positive and indicates that approximately 55.9% of the variance in the dependent variable can be explained by Digital Marketing. The model correctly fits the goals and the data, as shown by its moderate NFI of 0.687 and low SRMR number of 0.082. According to Table 3, Q^2 numbers above zero show that the model is predictively relevant and can accurately predict results. This shows that the model is good at predicting the future and fits the data well overall.

4.3. Discriminant Validity

4.3.1. Fornell-Larcker Criterion Analysis

Table 4 shows a similarity between AVEs and the square roots of latent variables (LVs). The reliability of the model was assessed using the Fornell-Larcker measure. The square root of a number in this range (0.792 to 0.942) represents the average value of all the factors. The discriminant validity of the constructs

is supported in this case by the fact that all diagonal values, which indicate the square roots of the AVEs for each construct, are greater than the off-diagonal values in the corresponding rows and columns. This means that each construct is distinct and shares more variance with its own measures than with those of other constructs in the model, which is a desirable outcome in model validation.

Variable's name	Artificial Intelligence	Consumer Behavior	Digital Marketing	Machine Learning Algorithms	Social Media Mining
Artificial Intelligence	**0.848**				
Consumer Behavior	0.644	**0.792**			
Digital Marketing	0.732	0.492	**0.942**		
Machine Learning Algorithms	0.503	0.304	0.467	**0.853**	
Social Media Mining	0.606	0.501	0.534	0.392	**0.809**

The diagonal values are the square root of the AVE (in bold) of the latent variables and indicates the highest in any column or raw. Note: LV—Latent variable.

4.3.2. Heterotrait-Monotrait (HTMT) Analysis

The evaluation of discriminant validity revealed that all HTMT values were below 0.90, as shown in Table 5. HTMT thresholds of 0.90 were employed to verify the discriminant validity of the variables(Polas, Kabir, Sohel-Uz-Zaman, Karim, & Tabash, 2022).

Table 5. The heterotrait-monotrait (HTMT) analysis for discriminant validity.

Variable's Name	Artificial Intelligence	Consumer Behavior	Digital Marketing	Machine Learning Algorithms	Social Media Mining
Artificial Intelligence					
Consumer Behavior	0.732				
Digital Marketing	0.821	0.570			
Machine Learning Algorithms	0.667	0.408	0.630		
Social Media Mining	0.692	0.587	0.623	0.526	

Note: Discriminant validity exists if the HTMT < 0.85 (Henseler et al., 2005) (Henseler & Fassott, 2010); Discriminant validity exists if the HTMT <0.90 (Gold et al., 2001).

4.3.3. Cross Loads

In order to assess discriminant validity, Table 6 offers the cross-loading values of individual items on various latent variables in the structural equation model (SEM). When each item loads substantially higher on its own construct (latent variable) than on other constructs, discriminant validity in SEM is sufficiently supported. The table shows that each item predominantly loads higher on its corresponding construct than on others, suggesting that the model possesses good discriminant validity. Each construct effectively captures variance specific to its intended measurement, distinct from other constructs in the model.

Table 6. Values of the cross loads of individual items in the SEM.

Items	Artificial Intelligence	Consumer Behavior	Digital Marketing	Machine Learning Algorithms	Social Media Mining
AI01	0.813	0.497	0.508	0.398	0.615
AI02	0.855	0.624	0.544	0.367	0.543
AI03	0.879	0.53	0.741	0.462	0.504
AI04	0.847	0.555	0.68	0.427	0.465
AI05	0.844	0.526	0.618	0.478	0.449
CB01	0.538	0.768	0.372	0.398	0.541
CB02	0.494	0.834	0.401	0.256	0.422
CB03	0.555	0.811	0.444	0.225	0.352
CB04	0.543	0.809	0.334	0.179	0.374
CB05	0.407	0.737	0.397	0.131	0.287
DM01	0.671	0.473	0.942	0.478	0.482
DM02	0.709	0.455	0.943	0.402	0.524
MLA01	0.408	0.216	0.384	0.84	0.253
MLA04	0.45	0.299	0.411	0.867	0.409
SMM01	0.486	0.258	0.347	0.323	0.765
SMM02	0.486	0.509	0.508	0.378	0.884
SMM03	0.609	0.464	0.483	0.36	0.867
SMM04	0.342	0.365	0.37	0.175	0.708

4.4. Assessment of the Structural Model

The structural model's assessment is shown in Figure 2. Bootstrapping was used using 2000 samples to determine the t-values and R-squared values.

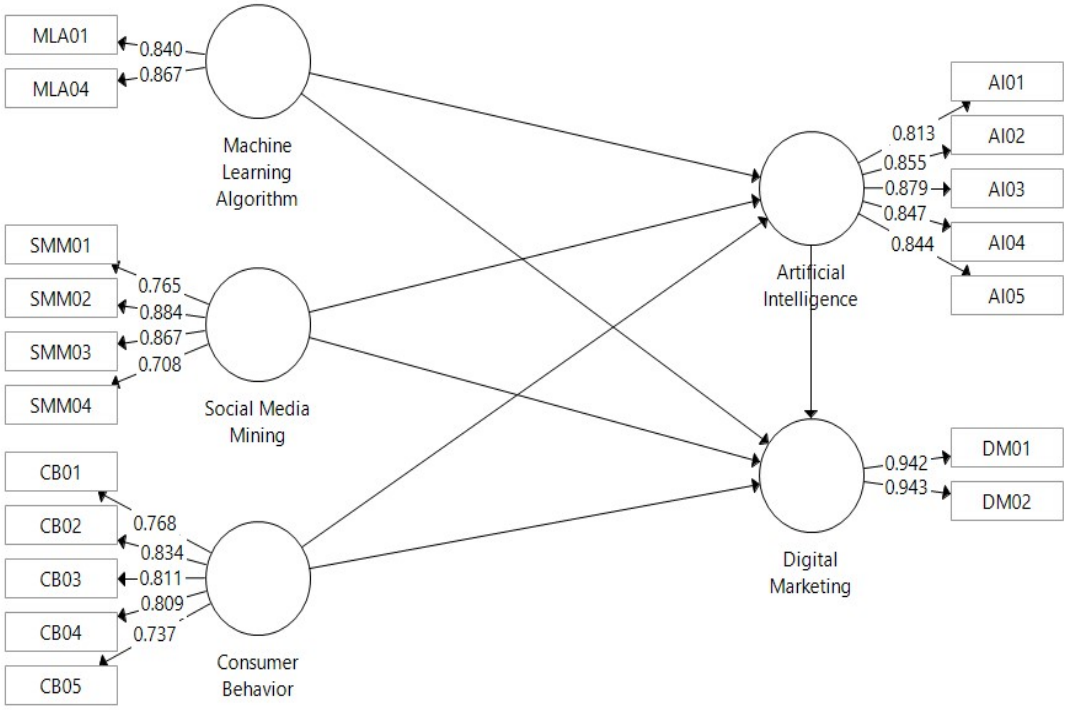

Figure 2. Standardized results of SEM calculations.

These standardized SEM values were generated using Smart PLS 3.2.8. The outer loading appeared to be high in relation to these two items. All of the variables' path coefficients seemed to be in decent condition.

4.5. Hypotheses Testing (Direct and Indirect Effects)

The results of the direct and indirect hypotheses are displayed in Table 7. Statistical bootstrapping was used to verify t-values. A 95% confidence interval can be used in regard to Smart PLS 3.2.8's p-value.

Table 7. Result of direct and indirect effect hypotheses.

Hypotheses	Relationship	Std Beta	Std Error	t-Value	p-Value	Decision
H1	Consumer Behavior → Artificial Intelligence → Digital Marketing	0.402	0.095	4.378	0	Supported
H2	Machine Learning Algorithms → Artificial Intelligence → Digital Marketing	0.253	0.065	4.021	0	Supported
H3	Social Media Mining → Artificial Intelligence → Digital Marketing	0.312	0.101	2.911	0.004	Supported
H4	Consumer Behavior → Digital Marketing	0.025	0.085	0.188	0.851	Rejected
H5	Machine Learning Algorithms → Digital Marketing	0.122	0.072	1.635	0.102	Rejected
H6	Social Media Mining → Digital Marketing	0.105	0.103	1.204	0.229	Rejected

According to the first hypothesis, artificial intelligence and consumer behavior have a favorable and significant relationship that impacts digital marketing. The results indicated that artificial intelligence and customer behavior substantially impacted digital marketing ($\beta = 0.402$, $t = 4.378$; $p < 0.05$; Table 7). We may conclude that our first hypothesis was correct in light of this evidence.

The second hypothesis proposed that there exists a positive and significant correlation between machine learning algorithms and artificial intelligence, which in turn influences digital marketing. Here, too, the data confirm the validity of our hypothesis, exhibiting a substantial positive effect ($\beta = 0.253$, $t = 4.021$; $p < 0.05$).

The third hypothesis states that artificial intelligence and social media mining have a positive and significant connection that impacts digital marketing. The results validated the hypothesis, which indicated a positive effect ($\beta = 0.312$, $t = 2.911$; $p < 0.05$). This highlights the significance of artificial intelligence and social media mining in digital marketing.

The impact of consumer behavior on digital marketing is illustrated by the fourth hypothesis. The findings, however, indicate that there was no discernible relationship between digital marketing and consumer behavior ($\beta = 0.025$, $t = 0.188$; $p > 0.05$). This indicates that our hypothesis was not supported.

We proposed the relationship between digital marketing and machine learning algorithms in our sixth hypothesis. Nevertheless, the p-value exceeded 0.05 and the beta coefficient number and t-value were not statistically significant ($\beta = 0.122$, $t = 0.072$; $p > 0.05$, see Table 7). As a result, our fifth theory is not supported by this evidence.

Lastly, in the sixth hypothesis, it was assumed that social media mining has a relationship with digital marketing, but eventually our theory was not supported by the test results ($\beta = 0.105$, $t = 0.103$; $p > 0.05$, see Table 7). Therefore, this finding too does not support the hypothesis.

5. Conclusion

The world is evolving and so are technological advancements, providing businesses with new opportunities to reach their target consumers. In this generation, the most prevalent technology that is on everyone's mind is artificial intelligence and it has taken the world by storm, especially in the digital marketing arena. Artificial Intelligence can help marketers move from traditional marketers towards marketing automation and catering to a more personalized approach in their strategies. With the help of Artificial intelligence and studying large amounts of data widely available in the market, marketers were able to customize their sales and efforts to exceed the expectations of the general public.

The traditional marketing model is now evolving with the integration of Artificial intelligence, which is helping in numerous ways, such as automating manual tasks, improving productivity, providing data-driven insights, and also reducing human errors. The way artificial intelligence is now used for storytelling and marketing, with its potential it is going transform the way people connect with businesses and their services. Human creativity will always be present in digital marketing; however, AI has the potential to open the eyes of marketers to new ways of approaching more efficient marketing operations and increasing productivity of multiple industries.

Just like any other research study, ours, too, had quite a few limitations. Primarily, A limited number of constructs were the subject of the study, making it impossible to fully capture the range of factors influencing digital marketing. Numerous other factors could give a different perspective on the impact digital marketing can have. Additionally, the study limited the information on qualitative data by concentrating on quantitative data. We were able to examine the unseen aspects of digital marketing by integrating qualitative data. The sample size and demographic differences may also impact the results' generalizability. To improve the findings' external reliability, future research might aim to use more representative and diverse samples. Future research may include exploring certain topics like Digital Advertising and Email Marketing and how they influence Digital Marketing. Furthermore, Artificial Intelligence will continue to be more advanced in the coming days, as a result, further research may examine the long-term impacts of artificial intelligence implementation on tailored marketing, re-marketing as well as customer retention. Besides that, investigating the ethical consequences of artificial intelligence in tailored content marketing is crucial, too, especially in light of privacy and data security concerns.

References

Alqurashi, D. R., Alkhaffaf, M., Daoud, M. K., Al-Gasawneh, J. A., & Alghizzawi, M. (2023). Exploring the impact of artificial intelligence in personalized content marketing: a contemporary digital marketing. *Migration Letters, 20*(S8), 548-560.

Bashang, S., & Puttanna, K. (2023). The Role of Artificial Intelligence in Digital Marketing: A Review. *International Research Journal of Economics and Management Studies IRJEMS, 2*(3).

Bhuvaneswari, l., Subadra, S., & Salma Shajahan, D. C. (2024). The Impact Of Artificial Intelligence (AI) On Digital Marketing. *Migration Letters, 21*(S6), 1132-1142.

Chintalapati, S., & Pandey, S. K. (2022). Artificial intelligence in marketing: A systematic literature review. *International Journal of Market Research, 64*(1), 38-68.

Dandotiya, G., Gahlot Sarkar, J., & Sarkar, A. (2024). Comprehending roles of virtual service assistant's warmth and competence for service co-creation versus service recovery. *Journal of Services Marketing, 38*(7), 925-940.

Ebrahimi, P., Basirat, M., Yousefi, A., Nekmahmud, M., Gholampour, A., & Fekete-Farkas, M. (2022). Social networks marketing and consumer purchase behavior: The combination of SEM and unsupervised machine learning approaches. *Big Data and Cognitive Computing, 6*(2), 35.

Gkikas, D. C., & Theodoridis, P. K. (2021). AI in consumer behavior *Advances in Artificial Intelligence-based Technologies: Selected Papers in Honour of Professor Nikolaos G. Bourbakis—Vol. 1* (pp. 147-176): Springer.

Gundecha, P., & Liu, H. (2012). Mining social media: a brief introduction. *New directions in informatics, optimization, logistics, and production*, 1-17.

Gupta, Y., & Khan, F. M. (2024). Role of artificial intelligence in customer engagement: a systematic review and future research directions. *Journal of Modelling in Management, 19*(5), 1535-1565.

Haque, A., Akther, N., Khan, I., Agarwal, K., & Uddin, N. (2024). *Artificial Intelligence in Retail Marketing: Research Agenda Based on Bibliometric Reflection and Content Analysis (2000–2023).* Paper presented at the Informatics.

Henseler, J., & Fassott, G. (2010). Testing moderating effects in PLS path models: An illustration of available procedures. *Handbook of partial least squares: Concepts, methods and applications*, 713-735.

Huang, M.-H., & Rust, R. T. (2021). A strategic framework for artificial intelligence in marketing. *Journal of the Academy of Marketing Science, 49*, 30-50.

Jiang, H., Cheng, Y., Yang, J., & Gao, S. (2022). AI-powered chatbot communication with customers: Dialogic interactions, satisfaction, engagement, and customer behavior. *Computers in Human Behavior, 134*, 107329.

Juan, A. A. (2024). *Decision Sciences: Second Decision Science Alliance International Summer Conference, DSA ISC 2024, Valencia, Spain, June 6–7, 2024, Proceedings, Part I*: Springer Nature.

Kaponis, A., & Maragoudakis, M. (2022). *Data Analysis in Digital Marketing using Machine learning and Artificial Intelligence Techniques, Ethical and Legal Dimensions, State of the Art.* Paper presented at the Proceedings of the 12th Hellenic Conference on Artificial Intelligence.

Khatri, M. (2021). How digital marketing along with artificial intelligence is transforming consumer behaviour. *International Journal for Research in Applied Science and Engineering Technology, 9*(VII), 523-527.

Liu, R., Gupta, S., & Patel, P. (2023). The application of the principles of responsible AI on social media marketing for digital health. *Information Systems Frontiers, 25*(6), 2275-2299.

Micu, A., Capatina, A., & Micu, A.-E. (2018). Exploring artificial intelligence techniques' applicability in social media marketing. *Journal of Emerging Trends in Marketing and Management, 1*(1), 156-165.

Miklosik, A., Kuchta, M., Evans, N., & Zak, S. (2019). Towards the adoption of machine learning-based analytical tools in digital marketing. *Ieee Access, 7*, 85705-85718.

Murgai, A. (2018). Transforming digital marketing with artificial intelligence. *International Journal of Latest Technology in Engineering, Management & Applied Science, 7*(4), 259-262.

Nandi, S., & Subrahmanyan, P. (2024). Exploring The Influence of Digital Marketing Strategies on Consumer Buying Behaviour. *Library of Progress-Library Science, Information Technology & Computer, 44*(3).

Perakakis, E., Mastorakis, G., & Kopanakis, I. (2019). Social media monitoring: An innovative intelligent approach. *Designs, 3*(2), 24.

Polas, M. R. H., Kabir, A. I., Sohel-Uz-Zaman, A. S. M., Karim, R., & Tabash, M. I. (2022). Blockchain technology as a game changer for green innovation: Green entrepreneurship as a roadmap to green economic sustainability in Peru. *Journal of Open Innovation: Technology, Market, and Complexity, 8*(2), 62.

Rabby, F., Chimhundu, R., & Hassan, R. (2021). Artificial intelligence in digital marketing influences consumer behaviour: a review and theoretical foundation for future research. *Academy of marketing studies journal, 25*(5), 1-7.

Rane, N., Choudhary, S., & Rane, J. (2024). Artificial intelligence and machine learning in business-to-business (B2B) sales and marketing: a review. *Available at SSRN 4842575*.

Serey, J., Quezada, L., Alfaro, M., Fuertes, G., Vargas, M., Ternero, R., . . . Gutierrez, S. (2021). Artificial intelligence methodologies for data management. *Symmetry, 13*(11), 2040.

Shevchyk, Y. (2024). Generative AI in e-commerce: a comparative analysis of consumer-brand engagement with AI-generated and human-generated content. *PhD diss*.

Sukdeo, N. I., & Mothilall, D. (2023). *The impact of artificial intelligence on the manufacturing sector: A systematic literature review of the printing and packaging industry.* Paper presented at the 2023 International Conference on Artificial Intelligence, Big Data, Computing and Data Communication Systems (icABCD).

Thaichon, P., & Quach, S. (2023). *Artificial intelligence for marketing management*: Routledge.

Thamaraiselvi, P., Masih, J., Giri, P., Sridevi, J., Shaikh, I. A. K., & Prasad, M. R. (2024). *Analysis of Social Media Marketing Impact on Customer Behaviour using AI & Machine Learning.* Paper presented at the 2024 Ninth International Conference on Science Technology Engineering and Mathematics (ICONSTEM).

Theodorakopoulos, L., & Theodoropoulou, A. (2024). Leveraging big data analytics for understanding consumer behavior in digital marketing: A systematic review. *Human Behavior and Emerging Technologies, 2024*(1), 3641502.

Toader, D.-C., Boca, G., Toader, R., Măcelaru, M., Toader, C., Ighian, D., & Rădulescu, A. T. (2019). The effect of social presence and chatbot errors on trust. *Sustainability, 12*(1), 256.

Trgovac, A. M., Mandić, A., & Marković, B. (2024). Tools of Artificial Intelligence Technology as a Framework for Transformation Digital Marketing Communication. *Tehnički glasnik, 18*(4), 660-665.

Villegas-Ch, W., Erazo, D. M., Ortiz-Garces, I., Gaibor-Naranjo, W., & Palacios-Pacheco, X. (2022). Artificial Intelligence Model for the Identification of the Personality of Twitter Users through the Analysis of Their Behavior in the Social Network. *Electronics, 11*(22), 3811.

Yadav, A., & Pandita, D. (2024). *A Decision Model for Revolutionizing Digital Marketing Campaigns Powered by AI and Predictive Analytics*. Paper presented at the 2024 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS).

Yang, X., Li, H., Ni, L., & Li, T. (2021). Application of artificial intelligence in precision marketing. *Journal of Organizational and End User Computing (JOEUC), 33*(4), 209-219.

Yin, J., & Qiu, X. (2021). AI technology and online purchase intention: Structural equation model based on perceived value. *Sustainability, 13*(10), 5671.

Ziakis, C., & Vlachopoulou, M. (2023). Artificial intelligence in digital marketing: Insights from a comprehensive review. *Information, 14*(12), 664.

Appendix A: Questionnaire Items

Machine Learning Algorithms

1. Do you highly rate platforms (music or video streaming services) that suggest content based on your likes and dislikes?
2. How satisfied are you with the precision of targeted advertisements that align with your interests and activities?
3. Do you appreciate the use of facial recognition while unlocking your smartphone or tagging friends in photos on social media as convenient technology?
4. How satisfied are you with the accuracy of personalized content recommendations by platforms such as Netflix or Spotify?
5. Do you think personalized recommendations based on your past interactions enhanced your experience on e-commerce websites?

Social Media Mining

1. Do you believe that personalized suggestions on social media enhance your online experience?
2. Do you find it helpful when social media platforms suggest new accounts to follow based on your current interests and connections?
3. Do you often find yourself interacting with posts shared on social media by brands and businesses you follow?
4. How likely are you to recommend products or services on social media that you have discovered through targeted advertisements?

Consumer Behavior

1. Do you often express your feelings about products or services on social media platforms?
2. How likely are you to make a purchase after receiving a personalized recommendation or discounts tailored to your likings?
3. To what extent do you believe personalized advertisements influence your online purchasing decisions?
4. How often do you research products or services online before making a purchase?
5. How likely are you to trust online reviews that are analyzed and categorized as "positive" by sentiment analysis algorithms?

Artificial Intelligence

1. "I am comfortable with AI personalizing my online shopping experience."- how do you feel about this statement?
2. "I trust AI to deliver relevant and useful content compared to traditional marketing methods." - how do you feel about this statement?
3. "I am concerned about the potential for AI to be biased in its marketing recommendations." - how do you feel about this statement?
4. People are concerned about AI replacing human marketing jobs. Do you think AI will create more marketing job opportunities than the ones it takes away?
5. In the future, would you be open to letting AI create and manage your own social media presence?

Digital Marketing

1. Digital marketing efforts are becoming increasingly personalized and relevant.
2. I feel comfortable with the amount of data collected through digital marketing.
3. Digital marketing campaigns often influence my purchasing decisions.
4. Digital marketing efforts have increased brand awareness for companies I follow.
5. Digital marketing helps build strong relationships between companies and consumers.