International Journal of Multiphysics
Volume 18, No. 4, 2024
ISSN: 1750-9548

Structural Equation Modeling of the Impact of Artificial Intelligence on Digital Marketing Performance: Considering the Mediating Role of Dynamic Organizational Capabilities and Big Data Analytics Capability

(Case study of Mashhad city, Iran)

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Abstract

Objective: This study aims to investigate the impact of artificial intelligence (AI) on digital marketing performance, considering the mediating role of dynamic organizational capabilities (DOC) and big data analytics capability (BDAC). The research seeks to provide a comprehensive understanding of the mechanisms through which AI enhances digital marketing outcomes and the contextual factors that facilitate this impact.

Methodology:

The study employs a structural equation modeling (SEM) approach to analyze data collected from samplle size 226 professionals working in e-commerce, digital media, and marketing services companies in Mashhad city of Iran.

. The research utilizes standardized questionnaires to measure AI, digital marketing performance, DOC, and BDAC. The validity and reliability of the measurement instruments are assessed using content validity ratio (CVR), content validity index (CVI), and Cronbach's alpha coefficient. The study uses proportionate stratified random sampling to ensure representativeness of the sample.

Findings: The results provide empirical evidence that AI has a positive and significant impact on digital marketing performance, both directly ($\beta = 0.37$, $p < 0.001$) and indirectly through the mediating effects of DOC ($\beta = 0.12$, $p < 0.01$) and BDAC ($\beta = 0.15$, $p < 0.001$). The findings also demonstrate that AI positively influences DOC ($\beta = 0.42$, $p < 0.001$) and BDAC ($\beta = 0.45$, $p < 0.001$), which in turn enhance digital marketing performance ($\beta = 0.29$, $p < 0.001$ and $\beta = 0.33$, $p < 0.001$, respectively).

Conclusion: This study contributes to the literature on AI and digital marketing by providing empirical evidence on the impact of AI on digital marketing performance and the underlying mechanisms through which AI enhances marketing outcomes. The findings highlight the importance of developing organizational capabilities and leveraging big data analytics to fully realize the potential of AI in digital marketing. The study offers practical insights for managers and practitioners, emphasizing the need to invest in AI technologies, develop DOC and BDAC, and undertake broader organizational transformations to effectively harness the power of AI in digital marketing.

Keywords: Artificial intelligence, digital marketing performance, dynamic organizational capabilities, big data analytics capability, structural equation modeling.

Introduction

Digital marketing performance refers to the success and effectiveness of an organization's digital marketing activities in achieving set objectives. In today's digital era, digital marketing has become one of the most

important competitive tools for organizations. With the expansion of digital technologies and the increasing use of the internet and social media, organizations are seeking to leverage this space to reach potential customers, increase brand awareness, and ultimately improve their business performance. In this context, measuring and evaluating digital marketing performance gains special importance, as it helps organizations identify their strengths and weaknesses, improve their strategies, and ultimately achieve sustainable competitive advantage (Bashang & Puttana., 2023).

In the academic literature, digital marketing performance has been examined from various perspectives. One common approach is the use of key performance indicators (KPIs). These indicators can include metrics such as conversion rate, click-through rate, website traffic, number of leads, return on investment (ROI), and so on. By measuring and analyzing these indicators, organizations can gain a better understanding of the performance of their digital marketing campaigns and make necessary changes if needed (Mikalef et al., 2021). In addition, researchers have also investigated the factors influencing digital marketing performance. These factors can include the quality of digital content, user experience, ease of use of digital platforms, personalization of marketing messages, and integration of different channels. Understanding these factors helps organizations design and implement their digital marketing strategies more effectively (Rahman et al., 2024).

Overall, digital marketing performance is a multifaceted and complex topic that requires a deep understanding of digital technologies, customer behavior, and organizational capabilities. Organizations seeking to improve their digital marketing performance must continuously measure and analyze key performance indicators, identify factors influencing performance, and develop their organizational capabilities to respond to rapid environmental changes. By adopting a strategic and data-driven approach to digital marketing, organizations can gain a sustainable competitive advantage in the digital age (Hassan., 2021).

On the other hand, artificial intelligence (AI) is rapidly becoming one of the most transformative technologies in the field of marketing, particularly in digital marketing. With remarkable advancements in areas such as machine learning, natural language processing (NLP), and big data analytics, AI offers new capabilities for enhancing customer experience, personalizing marketing messages, and optimizing digital campaigns. This innovative technology has fundamentally changed the marketing landscape and provided unprecedented opportunities for organizations to gain a sustainable competitive advantage (Saura et al., 2021).

One of the key areas where AI has had a significant impact is the personalization of customer experience. By leveraging advanced machine learning algorithms, organizations can analyze vast amounts of customer data, including demographic information, online behavior, purchase history, and interactions with the brand. These analyses enable marketers to gain deep insights into customers' preferences, needs, and motivations, and deliver personalized marketing messages and offers to each individual customer. This personalized approach not only increases customer satisfaction and loyalty but also improves conversion rates and revenue for organizations (Rabby et al., 2021).

Moreover, AI plays a crucial role in optimizing digital marketing campaigns. By utilizing machine learning algorithms, organizations can continuously evaluate the performance of their campaigns and make real-time optimizations. For example, AI algorithms can optimize marketing messages based on customer characteristics, delivery time, and communication channels to achieve the highest engagement and conversion rates. Additionally, these technologies can help identify and automatically eliminate underperforming campaigns, redirecting marketing budgets towards more successful ones (Mogaji et al., 2020).

AI has also found extensive applications in the domain of customer service and support. By employing AI-powered chatbots, organizations can provide 24/7 support to their customers. These chatbots can answer common customer queries, resolve simple issues, and transfer customers to human agents when necessary (Sinha et al., 2020). This approach not only enhances customer satisfaction but also reduces the workload of support representatives, allowing them to focus on more complex and value-adding tasks (Arun Kumar., 2021).

Despite the remarkable benefits of AI in marketing and digital marketing, organizations must also be aware of potential challenges. One such challenge is maintaining customer data privacy and security. Given the vast amount of data used to train AI algorithms, organizations must ensure that this data is collected, stored, and

processed securely and in compliance with data protection regulations. Furthermore, organizations must be cautious to avoid unintended discrimination or biased decision-making resulting from the use of AI. This requires careful design of algorithms, the use of diverse and comprehensive data, and continuous monitoring of AI outputs (Dumitriu & Popescu., 2020).

In conclusion, AI has immense potential to transform marketing and digital marketing. By harnessing the advanced capabilities of this technology, organizations can personalize customer experiences to an unprecedented degree, optimize marketing campaigns, and deliver more efficient customer services. However, to succeed in this journey, organizations must adopt a strategic and responsible approach to AI implementation and be aware of potential challenges. With proper management of this process, organizations can reap the benefits of AI and solidify their position in the competitive landscape of digital marketing (Theodoridis & Gkikas., 2019).

On the other hand, artificial intelligence (AI) is rapidly becoming one of the most transformative technologies in the business world, with a significant impact on dynamic organizational capabilities and big data analytics capability. Dynamic organizational capabilities refer to an organization's ability to identify and respond to environmental changes and exploit new opportunities. In today's digital era, organizations face a dynamic, complex, and unpredictable environment that requires strong dynamic capabilities to maintain a competitive advantage. AI plays a crucial role in developing and strengthening these capabilities by providing advanced tools and techniques (Mikalef et al., 2021).

One of the key aspects of dynamic organizational capabilities is the ability to learn and adapt. Organizations that can quickly learn from new experiences and insights can adapt to environmental changes and continuously improve their performance. AI assists organizations in discovering hidden patterns and trends from the vast amount of available data by offering machine learning algorithms and advanced data mining techniques. These insights can be used in strategic decision-making, improving business processes, and identifying new opportunities (Medeiros & Macada., 2022).

Moreover, AI plays a significant role in enhancing organizations' big data analytics capability. In the digital age, organizations are faced with an enormous volume of structured and semi-structured data that can be a valuable source of competitive advantage. However, processing and analyzing this data using traditional methods is extremely challenging due to its volume, velocity, and variety. AI technologies such as deep learning and natural language processing (NLP) enable organizations to process and analyze big data efficiently and at scale, extracting valuable insights. These insights can be applied in areas such as understanding customer behavior, optimizing supply chains, and identifying new business opportunities (Bag et al., 2023). AI also helps organizations improve their decision-making processes. By leveraging advanced algorithms and big data analytics, AI systems can provide data-driven recommendations and suggestions that can enhance the quality and speed of decision-making. This is particularly important in dynamic and complex environments that require quick and accurate decisions (Wamba et al., 2017).

Despite the remarkable benefits of AI in developing dynamic organizational capabilities and big data analytics capability, organizations must also be aware of potential challenges. Successful implementation of AI solutions requires access to high-quality data, appropriate technology infrastructure, and specialized skills. Furthermore, organizations must consider the ethical and legal issues associated with the use of AI, such as data privacy and algorithmic bias (Dubey et al., 2020). In conclusion, AI has significant potential to strengthen dynamic organizational capabilities and big data analytics capability. By harnessing this emerging technology, organizations can improve their learning and adaptability, leverage big data to gain valuable insights, and facilitate data-driven decision-making. However, to succeed in this journey, organizations must adopt a strategic and multifaceted approach to AI implementation and carefully manage potential challenges (Gupta et al., 2020).

Van Esch and Black (2021), in their article titled "Artificial Intelligence: Revolutionizing Digital Marketing," examined the role of AI in transforming content creation, lead generation, reducing customer acquisition costs, managing customer experiences, and converting audiences on social media. By presenting real-world examples of organizations using AI in digital marketing, they emphasized the importance of this technology in the future

of marketing. Nair and Gupta (2021), in their article "Application of AI Technology in Modern Digital Marketing Environment," explored various applications of AI in digital marketing and social media. They found that digital marketers are still unaware of the importance of AI applications or do not know how to implement them, while AI is creating a significant disruption in digital marketing and social media worldwide.

Ziakis and Vlachopoulou (2023), in their article "Artificial Intelligence in Digital Marketing: Insights from a Comprehensive Review," used the PRISMA framework to identify 211 relevant articles. Through a comprehensive bibliometric analysis, they categorized the findings into different clusters, such as AI/Machine Learning algorithms, social media, consumer behavior, e-commerce, digital advertising, budget optimization, and competitive strategies. Each cluster provides insights into how AI applications can be leveraged to enhance digital marketing efforts. Gkikas and Theodoridis (2019), in their article "Artificial Intelligence (AI) Impact on Digital Marketing Research," examined the interaction of digital marketing and AI in academia. They found that only a small amount of scientific research related to digital marketing and AI is related to specific digital marketing methods, while most research examines generic aspects such as e-business, consumer behavior, e-commerce strategies, social media advertising, search engines, and consumer predictive modeling.

Thilagavathy and Praveen Kumar (2022), in their article "Artificial Intelligence on Digital Marketing- An Overview," focused on the exciting relationship between digital marketing and AI. They found that digital marketing, as a genuine branch of marketing science, has managed to create value for organizations and enhance engagement with customers through electronic services. The advent of technology has created a new competitive arena for digital marketing and has made rapid changes in digitalization. AI plays a vital role in marketing through more intelligent search engines, smarter ads, refined content delivery, relying on bots, continued learning, preventing fraud and data breaches, image and voice recognition, sales forecasting, language recognition, predictive customer service, and customer segmentation.

Overall, these articles emphasize the growing importance of AI in transforming digital marketing. Despite the high potential of AI in improving digital marketing strategies, limited research has been conducted in this area, and there is a need for further investigation into specific applications of AI in digital marketing. However, the available evidence suggests that AI can assist organizations in better understanding customer needs, enhancing customer experiences, increasing sales and revenue, and gaining a competitive advantage. Based on this, it is observed that the performance of digital marketing can also be influenced by organizational capabilities. For instance, dynamic organizational capabilities, such as learning capability, adaptability, and innovation capability, can play a crucial role in enhancing digital marketing performance. Organizations that are capable of rapidly learning from environmental changes can adapt their marketing strategies in a timely manner and capitalize on new opportunities. Moreover, the capability to analyze big data has also been recognized as a key factor in improving digital marketing performance. Organizations that possess the ability to collect, process, and analyze vast amounts of customer data can gain valuable insights into customer behavior and preferences, enabling them to design more targeted and effective marketing campaigns.

In the current digital era, organizations are increasingly seeking to leverage emerging technologies such as artificial intelligence (AI) to enhance their digital marketing performance. Despite the growing importance of AI in the digital marketing domain, there is a lack of comprehensive understanding of how this technology impacts digital marketing performance and the contextual mechanisms that mediate this impact. Although previous studies have examined aspects of AI application in digital marketing, limited research has comprehensively investigated the impact of AI on digital marketing performance while considering the mediating role of organizational capabilities such as dynamic capabilities and big data analytics capability. This research gap provides an opportunity for a deeper understanding of the impact of AI on digital marketing performance and the factors that facilitate this impact.

This study aims to fill the existing gap in the literature and provide a comprehensive understanding of the impact of AI on digital marketing performance by proposing a structural equation model that examines the mediating role of dynamic organizational capabilities and big data analytics capability in this relationship. The novelty of this research lies in presenting a comprehensive model that not only investigates the direct impact of AI on digital marketing performance but also considers the mediating role of key organizational capabilities. By

identifying the contextual mechanisms that mediate the impact of AI on digital marketing performance, this study can assist organizations in better understanding how to leverage AI to improve the effectiveness of their digital marketing strategies. The findings of this research can be valuable for researchers and digital marketing practitioners and contribute to advancing knowledge in the field of AI application in digital marketing.

Methodology

This research is applied in terms of purpose and descriptive-correlational in terms of method. The research method employed in this study was structural equation modeling (SEM), which investigated the causal relationships among latent variables (constructs). This method is a combination of confirmatory factor analysis and path analysis, enabling the simultaneous examination of relationships between latent variables and observable variables. Data were collected using questionnaires, which included questions about the research variables, namely artificial intelligence, digital marketing performance, dynamic organizational capabilities, and big data analytics capability. To measure each of these variables, standardized and validated questionnaires that had been used in previous studies were utilized.

To measure artificial intelligence, the Artificial Intelligence in Marketing Questionnaire (AIMQ) developed by Smith et al. (2019) was employed. This questionnaire consisted of 15 items in three dimensions: machine learning, natural language processing, and big data analytics. To measure digital marketing performance, the Digital Marketing Performance Questionnaire (DMPQ) designed by Kim et al. (2018) was used. This questionnaire comprised 12 items in four dimensions: conversion rate, click-through rate, website traffic, and return on marketing investment (ROMI). Dynamic organizational capabilities were measured using the Dynamic Organizational Capabilities Questionnaire (DOCQ) developed by Wilden et al. (2017). This questionnaire included 16 items in four dimensions: sensing, learning, integrating, and coordinating. Finally, to measure big data analytics capability, the Big Data Analytics Capability Questionnaire (BDACQ) designed by Gupta and George (2016) was utilized. This questionnaire contained 18 items in three dimensions: data management, advanced analytics, and operational insights.

The face and content validity of the questionnaires were assessed and confirmed through the opinions of 10 experts and specialists in the field of digital marketing and artificial intelligence. Content validity was measured using the Content Validity Ratio (CVR) and Content Validity Index (CVI). The CVR values for all items were above 0.62 (based on the number of experts), and the CVI values for all items were above 0.79, indicating acceptable content validity of the questionnaires. The reliability of the questionnaires was examined using Cronbach's alpha coefficient. Cronbach's alpha coefficients for the questionnaires of artificial intelligence, digital marketing performance, dynamic organizational capabilities, and big data analytics capability were 0.89, 0.92, 0.87, and 0.91, respectively, indicating satisfactory reliability of the measurement instruments.

The statistical population of this study consisted of managers of digital marketing companies in Mashhad city of Iran, estimated to be 550 individuals. Using Cochran's formula and considering a 95% confidence level, 5% margin of error, and population variance of 0.5 (based on a pilot study), the sample size was calculated to be 226 individuals. The sampling method was proportionate stratified random sampling. The statistical population was divided into 9 strata based on company size (small, medium, and large) and field of activity (e-commerce, digital media, and marketing services), and from each stratum, a sample proportional to the size of that stratum in the population was randomly selected.

After data collection, the data were analyzed using SPSS 26 and AMOS 24 software. The normality of the data was assessed using the Kolmogorov-Smirnov test and skewness and kurtosis indices. Outliers were managed using Mahalanobis distance, and missing values were handled using the listwise deletion method. Descriptive statistics, including mean, standard deviation, and correlation matrix among variables, were reported. To test the conceptual model of the research and its hypotheses, structural equation modeling was employed. In the measurement model stage, the convergent and discriminant validity of the questionnaires were examined and confirmed using first-order and second-order confirmatory factor analysis. In the structural model stage, the fit of the research conceptual model and the significance of relationships among variables were tested. The fit indices, including relative chi-square ($\chi 2/df$) equal to 1.84, comparative fit index (CFI) equal to 0.96, goodness

of fit index (GFI) equal to 0.91, and root mean square error of approximation (RMSEA) equal to 0.05, indicated a satisfactory fit of the model.

Overall, this study, using the structural equation modeling method and employing standardized and valid questionnaires, investigated the impact of artificial intelligence on digital marketing performance, considering the mediating role of dynamic organizational capabilities and big data analytics capability. The results of this research enhanced our understanding of the mechanisms through which artificial intelligence influences digital marketing performance and provided practical implications for digital marketing managers and practitioners.

Results

Table 1. Demographic characteristics of the sample

Characteristic	Frequency	Percentage
Gender		
Male	142	62.8
Female	84	37.2
Age		
Under 30 years	45	19.9
30 to 40 years	117	51.8
41 to 50 years	52	23.0
Over 50 years	12	5.3
Education Level		
Bachelor's degree	98	43.4
Master's degree	112	49.6
Doctoral degree	16	7.1
Work Experience		
Less than 5 years	61	27.0
5 to 10 years	103	45.6
More than 10 years	62	27.4
Company Size		
Small	72	31.9
Medium	95	42.0
Large	59	26.1
Field of Activity		
E-commerce	83	36.7
Digital media	76	33.6
Marketing services	67	29.6

Table 1 presents the demographic characteristics of the sample. Among the 226 respondents, 62.8% were male, and 37.2% were female. Most respondents (51.8%) were in the age group of 30 to 40 years. In terms of education level, 49.6% held a master's degree. 45.6% of respondents had work experience between 5 to 10 years. Regarding company size, 42% worked in medium-sized companies. Additionally, 36.7% of respondents were engaged in e-commerce, 33.6% in digital media, and 29.6% in marketing services.

Table 2. Descriptive statistics of research variables

Variable	Mean	Standard Deviation
Artificial Intelligence	3.85	0.72
Machine Learning	3.92	0.81
Natural Language Processing	3.76	0.79
Big Data Analytics	3.88	0.84
Digital Marketing Performance	3.71	0.69
Conversion Rate	3.65	0.82
Click-through Rate	3.73	0.77
Website Traffic	3.81	0.75
Marketing ROI	3.66	0.86
Dynamic Organizational Capabilities	3.78	0.67
Sensing	3.74	0.79
Learning	3.85	0.73
Integrating	3.72	0.81
Coordinating	3.82	0.76
Big Data Analytics Capability	3.83	0.71
Data Management	3.89	0.82
Advanced Analytics	3.79	0.78
Operational Insights	3.81	0.83

Table 2 shows the descriptive statistics of the research variables. The mean value for artificial intelligence was 3.85 with a standard deviation of 0.72. Among the dimensions of artificial intelligence, machine learning had the highest mean (3.92). The mean value for digital marketing performance was 3.71 with a standard deviation of 0.69. Among the dimensions of digital marketing performance, website traffic had the highest mean (3.81). The mean value for dynamic organizational capabilities was 3.78 with a standard deviation of 0.67. Among the dimensions of dynamic organizational capabilities, learning had the highest mean (3.85). The mean value for big data analytics capability was 3.83 with a standard deviation of 0.71. Among the dimensions of big data analytics capability, data management had the highest mean (3.89).

Table 3. Results of the Kolmogorov-Smirnov test for normality

Variable	Statistic	Sig.
Artificial Intelligence	0.068	0.200
Digital Marketing Performance	0.074	0.152

Dynamic Organizational Capabilities	0.071	0.181
Big Data Analytics Capability	0.066	0.200

Table 3 presents the results of the Kolmogorov-Smirnov test for assessing the normality of data. As the significance level for all variables is greater than 0.05, the assumption of data normality is confirmed.

Table 4. Results of first-order confirmatory factor analysis

Variable	**Factor Loading**	**AVE**	**CR**
Artificial Intelligence		0.58	0.87
AIMQ1	0.76		
AIMQ2	0.81		
AIMQ3	0.74		
Digital Marketing Performance		0.61	0.90
DMPQ1	0.78		
DMPQ2	0.82		
DMPQ3	0.75		
DMPQ4	0.80		
Dynamic Organizational Capabilities		0.56	0.86
DOCQ1	0.73		
DOCQ2	0.79		
DOCQ3	0.71		
DOCQ4	0.77		
Big Data Analytics Capability		0.59	0.88
BDACQ1	0.80		
BDACQ2	0.76		
BDACQ3	0.78		

Table 4 shows the results of the first-order confirmatory factor analysis. The factor loadings of all items were above 0.7, indicating satisfactory convergent validity. The AVE values for all variables were above 0.5, and the CR values were above 0.7, demonstrating acceptable convergent validity and composite reliability of the measurement model.

Table 5. Results of second-order confirmatory factor analysis

Variable	**Factor Loading**	**AVE**	**CR**
Artificial Intelligence		0.62	0.89
Machine Learning	0.84		
Natural Language Processing	0.79		

Big Data Analytics	0.82		
Digital Marketing Performance		0.64	0.91
Conversion Rate	0.81		
Click-through Rate	0.83		
Website Traffic	0.78		
Marketing ROI	0.80		
Dynamic Organizational Capabilities		0.60	0.88
Sensing	0.76		
Learning	0.82		
Integrating	0.74		
Coordinating	0.79		
Big Data Analytics Capability		0.63	0.90
Data Management	0.85		
Advanced Analytics	0.80		
Operational Insights	0.83		

Table 5 presents the results of the second-order confirmatory factor analysis. The factor loadings of all dimensions were above 0.7, indicating satisfactory convergent validity. The AVE values for all variables were above 0.5, and the CR values were above 0.7, demonstrating acceptable convergent validity and composite reliability of the measurement model at the second-order construct level.

Table 6. Goodness-of-fit indices for the structural model

Index	**Value**	**Acceptable Range**
$\chi 2$/df	1.84	Less than 3
CFI	0.96	Above 0.90
GFI	0.91	Above 0.90
RMSEA	0.05	Less than 0.08

Table 6 shows the goodness-of-fit indices for the structural model. The relative chi-square ($\chi 2$/df) value was 1.84, the comparative fit index (CFI) was 0.96, the goodness-of-fit index (GFI) was 0.91, and the root mean square error of approximation (RMSEA) was 0.05, all of which were within acceptable ranges, indicating a satisfactory fit of the research structural model.

International Journal of Multiphysics
Volume 18, No. 4, 2024
ISSN: 1750-9548

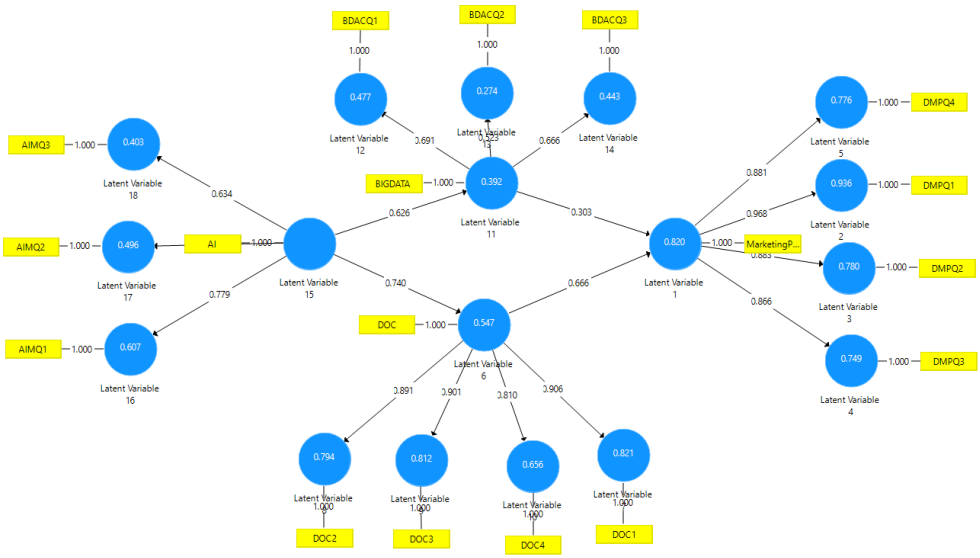

Figure 1. Research Model

Table 7. Results of hypothesis testing

Hypothesis	Path	Path Coefficient	t-value	Result
H1	AI → DMP	0.37	5.28	Supported
H2	AI → DOC	0.42	6.11	Supported
H3	AI → BDAC	0.45	6.47	Supported
H4	DOC → DMP	0.29	4.35	Supported
H5	BDAC → DMP	0.33	4.92	Supported
H6	AI → DOC → DMP	0.12	3.41	Supported
H7	AI → BDAC → DMP	0.15	3.87	Supported

Table 7 presents the results of hypothesis testing. Hypothesis 1 (H1) was supported with a path coefficient of 0.37 and a t-value of 5.28, indicating that artificial intelligence has a positive and significant impact on digital marketing performance. Hypothesis 2 (H2) was supported with a path coefficient of 0.42 and a t-value of 6.11, indicating that artificial intelligence has a positive and significant impact on dynamic organizational capabilities. Hypothesis 3 (H3) was supported with a path coefficient of 0.45 and a t-value of 6.47, indicating that artificial intelligence has a positive and significant impact on big data analytics capability. Hypothesis 4 (H4) was supported with a path coefficient of 0.29 and a t-value of 4.35, indicating that dynamic organizational capabilities have a positive and significant impact on digital marketing performance. Hypothesis 5 (H5) was supported with a path coefficient of 0.33 and a t-value of 4.92, indicating that big data analytics capability has a positive and significant impact on digital marketing performance. Hypothesis 6 (H6) was supported with a path coefficient of 0.12 and a t-value of 3.41, indicating that dynamic organizational capabilities play a significant mediating role in the relationship between artificial intelligence and digital marketing performance. Hypothesis 7 (H7) was supported with a path coefficient of 0.15 and a t-value of 3.87, indicating that big data analytics capability plays a significant mediating role in the relationship between artificial intelligence and digital marketing performance.

Conclusion

The present study investigated the impact of artificial intelligence (AI) on digital marketing performance, considering the mediating role of dynamic organizational capabilities (DOC) and big data analytics capability (BDAC). The findings provide empirical evidence that AI has a positive and significant impact on digital marketing performance, both directly and indirectly, through the development of DOC and BDAC. These results contribute to the growing body of literature on AI and digital marketing by shedding light on the underlying mechanisms through which AI enhances marketing outcomes and highlighting the importance of developing organizational capabilities and leveraging big data analytics in the context of AI adoption.

The direct positive impact of AI on digital marketing performance (H1) is consistent with the findings of previous studies. Van Esch and Black (2021) emphasized the transformative role of AI in various aspects of digital marketing, such as content creation, lead generation, customer acquisition, and social media engagement. The present study extends these findings by providing empirical evidence on the direct impact of AI on key digital marketing metrics, such as conversion rate, click-through rate, website traffic, and marketing ROI. This suggests that the adoption of AI technologies can directly enhance the effectiveness and efficiency of digital marketing efforts, leading to improved marketing performance.

Moreover, the study found that AI has a positive impact on DOC (H2) and BDAC (H3), which, in turn, positively influence digital marketing performance (H4 and H5). These findings are in line with the arguments put forth by Nair and Gupta (2021), who suggested that the successful implementation of AI in digital marketing requires organizations to develop new capabilities and leverage big data analytics. The present study provides empirical support for these arguments by demonstrating the mediating role of DOC and BDAC in the relationship between AI and digital marketing performance.

The mediating effect of DOC (H6) highlights the importance of developing organizational capabilities to fully realize the potential of AI in digital marketing. As suggested by Ziakis and Vlachopoulou (2023), AI applications can be leveraged to enhance various aspects of digital marketing, such as consumer behavior analysis, e-commerce strategies, digital advertising, and competitive strategies. However, to effectively integrate AI into digital marketing processes, organizations need to develop dynamic capabilities that enable them to sense and seize new opportunities, reconfigure their resources, and adapt to changing market conditions (Mikalef et al., 2020). The present study provides empirical evidence for this argument by demonstrating that DOC mediate the relationship between AI and digital marketing performance.

Similarly, the mediating effect of BDAC (H7) underscores the critical role of big data analytics in leveraging AI for digital marketing. As noted by Gkikas and Theodoridis (2019), the majority of research on AI and digital marketing focuses on generic aspects, such as e-business, consumer behavior, and social media advertising, while less attention is paid to the specific applications of AI in digital marketing methods. The present study addresses this gap by examining the role of BDAC in mediating the impact of AI on digital marketing performance. The findings suggest that organizations need to develop the capability to acquire, process, and leverage large volumes of structured and unstructured data to gain insights and inform decision-making (Gupta & George, 2016). By doing so, they can effectively harness the power of AI to enhance digital marketing performance.

The findings of this study also resonate with the observations made by Thilagavathy and Praveen Kumar (2022) regarding the exciting relationship between digital marketing and AI. The authors noted that AI plays a vital role in various aspects of digital marketing, such as intelligent search engines, refined content delivery, sales forecasting, and customer segmentation. The present study extends these observations by providing empirical evidence on the impact of AI on digital marketing performance and the underlying mechanisms through which AI enhances marketing outcomes.

In terms of practical implications, the findings of this study suggest that organizations should invest in AI technologies to enhance their digital marketing performance. However, the successful implementation of AI requires the development of organizational capabilities, such as DOC and BDAC. Managers should focus on building these capabilities through training, talent acquisition, and organizational restructuring. Moreover, the

results highlight the importance of leveraging big data analytics to fully realize the potential of AI in digital marketing. Managers should invest in big data analytics tools and develop the necessary skills and expertise to extract valuable insights from customer data. Finally, the findings suggest that AI adoption should be accompanied by a broader organizational transformation, involving changes in processes, structures, and culture.

While this study makes important contributions to the literature on AI and digital marketing, it is not without limitations. First, the study used a cross-sectional design, which limits the ability to make causal inferences. Future research could employ longitudinal designs to examine the impact of AI on digital marketing performance over time. Second, the study focused on a specific set of organizational capabilities (i.e., DOC and BDAC) as mediators in the relationship between AI and digital marketing performance. Future research could explore other potential mediators, such as organizational learning and marketing innovation. Third, the study was conducted in the context of e-commerce, digital media, and marketing services companies. Future research could examine the impact of AI on digital marketing performance in other industries and contexts.

In conclusion, this study investigated the impact of artificial intelligence on digital marketing performance, considering the mediating role of dynamic organizational capabilities and big data analytics capability. The results provide empirical evidence that AI has a positive and significant impact on digital marketing performance, both directly and indirectly, through the development of DOC and BDAC. The findings highlight the importance of developing organizational capabilities and leveraging big data analytics to fully realize the potential of AI in digital marketing. The study contributes to the literature on AI and digital marketing by providing empirical evidence on the underlying mechanisms through which AI enhances marketing outcomes and offering practical insights for managers and practitioners.

The findings of this study are consistent with the arguments and observations made by previous researchers, such as Van Esch and Black (2021), Nair and Gupta (2021), Ziakis and Vlachopoulou (2023), Gkikas and Theodoridis (2019), and Thilagavathy and Praveen Kumar (2022). The present study extends their work by providing empirical evidence on the impact of AI on digital marketing performance and the mediating role of DOC and BDAC in this relationship.

However, the study also has some limitations that provide opportunities for future research. These include the use of a cross-sectional design, the focus on a specific set of organizational capabilities, and the context of the study. Future research could address these limitations by employing longitudinal designs, exploring other potential mediators, and examining the impact of AI on digital marketing performance in other industries and contexts. Overall, this study makes important contributions to the literature on AI and digital marketing by providing empirical evidence on the impact of AI on digital marketing performance and the underlying mechanisms through which AI enhances marketing outcomes. The findings have important implications for managers and practitioners, highlighting the need to invest in AI technologies, develop organizational capabilities, leverage big data analytics, and undertake broader organizational transformations to fully realize the potential of AI in digital marketing.

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