

Assessing the Impact of Artificial Intelligence on the E-Marketing Mix in Algerian Start-ups: An Empirical PLS-SEM Analysis

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Abstract

This study examines the impact of artificial intelligence (AI) on the e-marketing mix strategies adopted by Algerian start-ups, focusing on seven key dimensions: product, pricing, place, promotion, privacy, website, and customisation.

Data were collected through an online questionnaire administered to a stratified random sample of employees working in Algerian start-ups, resulting in 278 valid responses. The proposed research model was analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS software.

The results reveal that AI has a statistically significant positive effect on customisation, website, pricing, place, and privacy strategies. However, no statistically significant relationships were identified between AI and either product or promotion strategies.

Keywords: artificial intelligence, e-marketing mix, Algerian start-ups, digital transformation, PLS-SEM, customisation strategy.

JEL Classification: M31, M15, O33

1. Introduction

The rapid pace of digital transformation has fundamentally changed the way marketing activities are conducted. In this environment, e-marketing has become an essential tool through which start-ups strengthen their market presence, engage with customers, and improve their competitive position (Jaas, 2022). As business environments continue to evolve and consumer expectations become increasingly dynamic, start-ups are required to adopt flexible, data-driven marketing approaches that enable them to respond effectively to changing market conditions (Buhalis et al., 2020).

Within this evolving landscape, artificial intelligence (AI) has emerged as a transformative technology that is reshaping contemporary marketing practices. Its ability to analyse large volumes of data, identify behavioural patterns, and support informed decision-making has made AI an important strategic resource for improving marketing performance and customer engagement (Davenport et al., 2019; Borges et al., 2020). AI applications, including intelligent recommendation systems, chatbots, and predictive analytics, enable organisations to deliver more personalised customer experiences while enhancing the quality of their digital services (Campbell et al., 2020; Gabelaia, 2022). These capabilities are particularly valuable for start-ups, which often operate with limited financial and technological resources and therefore require efficient solutions to support growth and strengthen their competitive position.

Despite its considerable potential, the integration of AI into e-marketing remains associated with several challenges. Constraints related to digital infrastructure, specialised expertise, data protection, and the difficulty of assessing AI's actual contribution to marketing performance continue to influence its effective implementation. Furthermore, although previous research has extensively examined AI in marketing, empirical evidence has largely been drawn from large organisations in developed economies. Comparatively little attention has been paid to how AI affects the individual dimensions of the e-marketing mix within start-ups operating in emerging economies.

The Algerian context provides a particularly relevant setting for investigating this issue. Although increasing attention has recently been directed towards the development of the national start-up ecosystem, these firms continue to operate under financial, technological, and structural constraints that distinguish them from their counterparts in developed economies. Consequently, findings reported in international studies cannot be readily generalised to the Algerian context, highlighting the need for empirical research that reflects its specific economic and technological conditions.

Accordingly, this study examines the impact of artificial intelligence on the seven dimensions of the e-marketing mix product, pricing, place, promotion, privacy, website, and customisation within Algerian start-ups. By providing empirical evidence from an emerging economy, the study seeks to enrich the existing literature on AI-enabled digital marketing while offering practical insights that may assist both researchers and practitioners.

In light of this, the study seeks to answer the following research question:

What is the impact of artificial intelligence on the dimensions of the e-marketing mix in Algerian start-ups?

2. Literature review

2.1. Artificial Intelligence

performing tasks that normally require human cognitive abilities, such as learning, reasoning, problem-solving, and decision-making. Tanimoto (1987) described AI as an attempt to replicate human cognitive processes, whereas McCarthy (2007) defined it as the science and engineering of creating intelligent machines and computer programmes. In the marketing domain, AI is widely recognised as a collection of intelligent technologies that enable organisations to analyse data, better understand customer behaviour, and support managerial decision-making, thereby improving marketing effectiveness and encouraging more data-informed practices (Roetzer, 2021).

The growing importance of AI stems from its ability to automate routine activities, analyse large datasets, identify patterns that conventional analytical methods may overlook, and continuously improve its performance through learning from data (Hawking, 2014; Nadimpalli, 2017). In addition, applications such as recommendation systems, chatbots, and natural language processing technologies allow organisations to deliver more personalised customer experiences while enhancing managerial decision-

making, organisational performance, and innovation (Charniak et al., 2014; Cannella, 2018; Davenport et al., 2019). As a result, AI is increasingly viewed not merely as a technological tool but as a strategic organisational capability that supports value creation and strengthens competitive advantage across a wide range of business activities (Imran et al., 2014).

2.2. E-marketing

E-marketing can be defined as the use of digital technologies and online communication channels to plan and implement marketing activities in ways that strengthen interactions between organisations and their customers. It involves the use of websites, social media platforms, search engines, e-mail, and digital advertising to promote products and services, increase market visibility, and develop lasting customer relationships (Yasmin & Tasneem, 2015; Chaffey & Ellis-Chadwick, 2016). In addition, the availability of data generated through digital platforms enables organisations to deliver more personalised interactions, improve service quality, and enhance the overall customer experience (Luu et al., 2021).

The value of e-marketing lies in its ability to provide a more interactive and measurable marketing environment than conventional approaches. It enables organisations to reach target markets more effectively, monitor the performance of marketing campaigns on an ongoing basis, and analyse customer preferences to support better marketing decisions. As digital transformation continues to reshape business practices, e-marketing has become an integral part of organisational strategy, helping firms improve marketing performance and strengthen their competitive position (Chaffey & Ellis-Chadwick, 2016).

2.3 Utilising Artificial Intelligence within the E-Marketing Mix

The growing diffusion of digital technologies has brought about a substantial transformation in contemporary marketing practices, with organisations increasingly relying on data analysis rather than personal experience or traditional judgement when making marketing decisions. This shift has enabled firms to process large volumes of customer information, identify behavioural patterns, and generate insights that support more accurate and effective decision-making.

Within the e-marketing mix, AI is increasingly viewed as a strategic organisational capability that enhances the efficiency of marketing activities through machine learning, predictive analytics, and intelligent automation. These technologies contribute to product development, pricing optimisation, distribution efficiency, privacy management, website performance, and the delivery of more personalised customer experiences (Verma, 2021). This perspective is consistent with the Resource-Based View (RBV), which argues that organisations can achieve sustained competitive advantage through the effective deployment of valuable resources and capabilities.

Despite the growing interest in AI applications in marketing, empirical evidence concerning its influence on the individual dimensions of the e-marketing mix remains limited, particularly among start-ups operating in emerging economies. Most previous studies have concentrated on large organisations or examined AI adoption from a broad perspective without distinguishing its effects across different marketing strategies. Consequently, the present study investigates the influence of AI on the seven dimensions of the e-marketing mix within Algerian start-ups, thereby contributing to the literature on AI adoption in emerging business environments.

2.3.1. AI and Customisation Strategy

AI enables organisations to deliver products, services, and digital experiences that are more closely aligned with customer needs by analysing preferences and behavioural data. Predictive analytics further support tailored recommendations that enhance customer satisfaction, engagement, and long-term relationships.

H1: AI adoption has a positive and statistically significant effect on customisation strategy effectiveness in Algerian start-ups.

2.3.2. AI and Place Strategy

Distribution activities increasingly benefit from AI applications that optimise logistics, inventory management, and supply chain operations. Real-time analytics and intelligent tracking technologies improve operational efficiency, reduce delivery delays, and enhance service quality (De Carlo et al., 2021).

H2: AI adoption has a positive and statistically significant effect on place strategy effectiveness in Algerian start-ups.

2.3.3. AI and Pricing Strategy

AI contributes to pricing decisions by simultaneously analysing customer behaviour, market conditions, and competitor information. Predictive models enable organisations to implement dynamic pricing strategies, anticipate customer responses, and optimise pricing decisions in rapidly changing digital markets (Nanayakkara, 2020).

H3: AI adoption has a positive and statistically significant effect on pricing strategy effectiveness in Algerian start-ups.

2.3.4 AI and Promotion Strategy

AI strengthens promotional activities by supporting audience segmentation, predicting customer behaviour, and delivering personalised marketing communications. These capabilities help organisations improve promotional content, select appropriate timing and channels, and increase customer engagement.

H4: AI adoption has a positive and statistically significant effect on promotion strategy effectiveness in Algerian start-ups.

2.3.5. AI and Website Strategy

Websites represent a major point of interaction between organisations and customers in digital environments. AI helps improve website performance through intelligent search functions, personalised user experiences, chatbot services, and continuous analysis of user behaviour to enhance website effectiveness.

H5: AI adoption has a positive and statistically significant effect on website strategy effectiveness in Algerian start-ups.

2.3.6. AI and Privacy Strategy

As reliance on digital information continues to grow, privacy management has become increasingly important. AI supports data protection by detecting security threats, monitoring compliance with data protection requirements, and strengthening data governance practices, thereby increasing customer trust in digital environments.

H6: AI adoption has a positive and statistically significant effect on privacy strategy effectiveness in Algerian start-ups.

2.3.7. AI and Product Strategy

AI can support product strategy by enabling organisations to analyse customer feedback, market trends, and behavioural data more effectively. Such capabilities facilitate continuous product improvement, strengthen product-market alignment, and increase customer value through personalised recommendations and data-driven product development (Dzyabura & Hauser, 2019).

H7: AI adoption has a positive and statistically significant effect on product strategy effectiveness in Algerian start-ups.

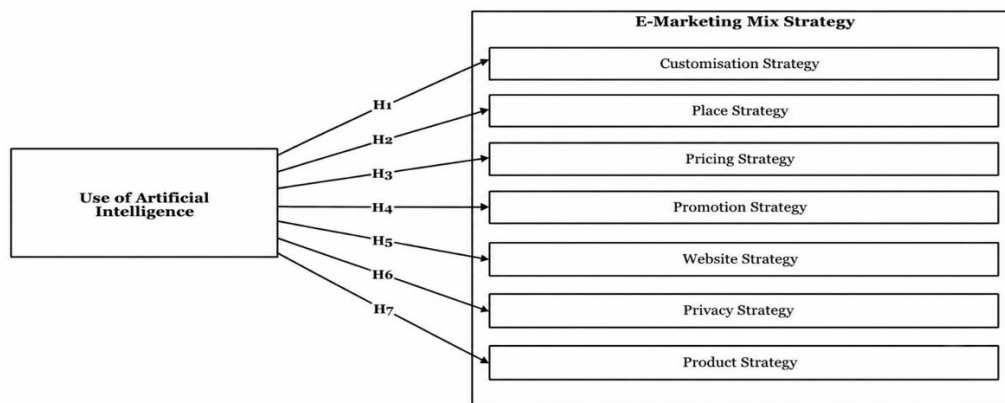


Figure 1. Conceptual model of the research

Source: Authors' own creation

3. Research Methodology

3.1. Population and sample

The study targeted Algerian start-ups officially registered in the database of the Ministry of Start-ups and Micro-enterprises. To obtain a representative distribution of respondents across the population, a stratified random sampling approach was adopted. The minimum sample size was determined using G*Power software (version 3.1.9.7) based on an anticipated effect size of 0.10, resulting in a minimum requirement of 245 observations. Following the data collection process, 278 valid questionnaires were retained for analysis, exceeding the minimum threshold required for statistical testing.

3.2. Data collection and analysis

Primary data were collected through an online questionnaire distributed to individuals within Algerian start-ups. The data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) via Smart PLS software, given its suitability for testing models with multiple latent variables. The analysis was conducted in two stages: the first involved assessing the measurement model for reliability and validity, while the second focused on evaluating the structural model by examining multicollinearity, explanatory power, and the significance of path coefficients.

3.3. Common method bias

To minimise the risk of common method bias (CMB), several procedural measures were implemented during the design and administration of the questionnaire. Respondents were assured that their answers would remain anonymous, were informed that there were no right or wrong responses, and the questionnaire items were arranged to reduce potential cognitive associations between the study variables. In addition, Harman's single-factor test was performed to assess the presence of common

method bias. The results showed that the first factor accounted for 26.2% of the total variance, which is below the commonly accepted threshold, indicating that common method bias is unlikely to have materially affected the findings of this study.

4. Results and Discussions

The data were analysed using the standard two-stage procedure of Partial Least Squares Structural Equation Modelling (PLS-SEM). In the first stage, the measurement model was assessed to establish convergent and discriminant validity. The second stage involved evaluating the structural model through path coefficient analysis and the bootstrapping procedure to examine the statistical significance of the hypothesised relationships

4.1. Convergent validity

To assess the quality of the measurement model, convergent validity was evaluated using outer loadings, Cronbach's alpha, composite reliability (CR), and the average variance extracted (AVE). Following Henseler et al. (2016), outer loadings above 0.708 indicate acceptable indicator reliability, whereas AVE values above 0.50 demonstrate adequate convergent validity. Indicators with loadings between 0.40 and 0.70 were examined carefully before deciding whether to retain or remove them, while those below 0.40 were excluded unless their retention was theoretically justified. Table 1 presents the results for all constructs and measurement indicators.

Table 1. Convergent validity of the measurement model

Model Constructs	Construct Dimensions	Model Items	Factor Loading (F > 0.70)	Composite Reliability (CR > 0.7)	Cronbach's Alpha	AVE > 0.50
Artificial Intelligence		AI1	0.781	0.790	0.830	0.570
		AI2	0.775			
		AI3	0.802			
		AI4	0.763			
		AI5	0.744			
		AI6	0.709			
E-Marketing	Customisation Strategy	CUST1	0.812	0.850	0.820	0.650
		CUST2	0.798			
		CUST3	0.806			
	Place Strategy	PLA1	0.761	0.810	0.780	0.590
		PLA2	0.784			
		PLA3	0.750			
	Pricing Strategy	PRIC1	0.732	0.790	0.760	0.560
		PRIC2	0.748			
		PRIC3	0.761			
		PROM1	0.804	0.870	0.850	0.620

	Promotion Strategy	PROM2	0.781			
		PROM3	0.793			
		PROM4	0.776			
	Website Strategy	WEB1	0.721	0.760	0.730	0.520
		WEB2	0.734			
		WEB3	0.715			
	Privacy Strategy	PRIV1	0.701	0.740	0.710	0.510
		PRIV2	0.726			
		PRIV3	0.713			
	Product Strategy	PROD1	0.812	0.860	0.840	0.610
		PROD2	0.785			
		PROD3	0.774			
		PROD4	0.768			

Source: Authors' elaboration based on Smart PLS output

The results presented in Table 1 indicate that all indicator loadings exceeded the recommended threshold of 0.70, ranging from 0.701 to 0.812, confirming satisfactory indicator reliability across all constructs. Composite Reliability (CR) values ranged from 0.740 to 0.870, while Cronbach's alpha coefficients ranged from 0.710 to 0.850, indicating an acceptable level of internal consistency. Furthermore, all Average Variance Extracted (AVE) values exceeded the recommended threshold of 0.50, ranging from 0.510 to 0.650, demonstrating adequate convergent validity for all constructs. Overall, these findings indicate that the measurement model satisfies the recommended criteria for reliability and convergent validity.

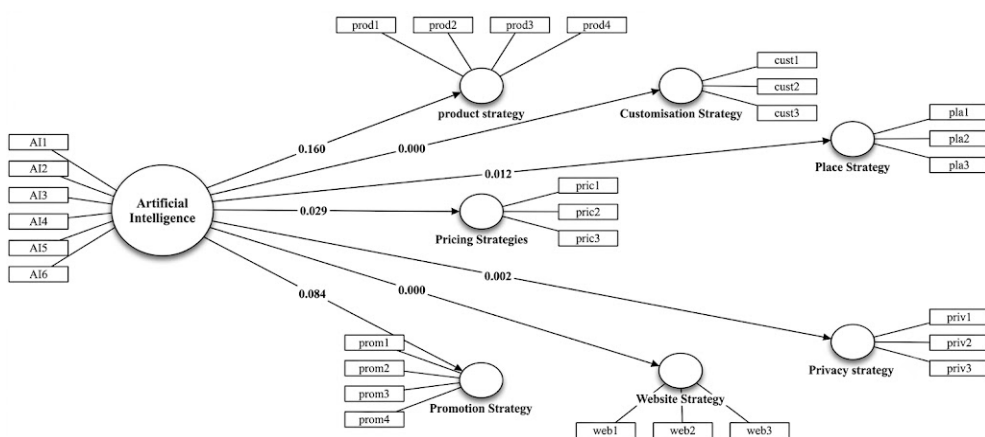


Figure 2. Structural model of the proposed research framework

Source: Authors' own creation.

4.2. Discriminant validity

Discriminant validity was assessed employing the Fornell-Larcker criterion. This foundational metric dictates that the square root of the Average Variance Extracted (AVE) for a given construct must strictly exceed its correlations with all other latent constructs within the structural model (Fornell et al., 2016).

Table 2. Discriminant validity assessment using the Fornell-Larcker criterion

	AI	PRO D	PRI C	PLA	PRO M	PRI V	WE B	CUST
AI	0.768							
PROD	0.083	0.781						
PRIC	0.129	0.442	0.748					
PLA	0.141	0.401	0.607	0.768				
PRO M	0.098	0.290	0.402	0.603	0.787			
PRIV	0.170	0.167	0.268	0.327	0.204	0.714		
WEB	0.229	0.280	0.267	0.311	0.227	0.438	0.721	
CUST	0.308	0.221	0.371	0.386	0.339	0.392	0.498	0.806

Source: Authors' elaboration based on Smart PLS output

The results presented in Table 2 indicate that the square root of the Average Variance Extracted (AVE) for each construct, represented by the diagonal values, exceeded its correlations with all other constructs in the model. These findings confirm that all constructs satisfy the Fornell-Larcker criterion, demonstrating adequate discriminant validity. Accordingly, the study constructs can be regarded as empirically distinct, supporting the validity of the measurement model and justifying the subsequent assessment of the structural model.

4.3. Path analysis and hypothesis testing

The structural model was assessed using path coefficients, t-statistics, and p-values in order to examine the hypothesised relationships among the study constructs. A path is considered statistically significant when the t-value exceeds 1.96 and the p-value is below 0.05. More specifically, a p-value below 0.05 indicates statistical significance at the 5% level, whereas a p-value below 0.01 indicates a higher level of significance.

Table 3 presents the results of the hypothesis testing for the structural model.

Table 3. Hypothesis testing of the structural model

Hy p	Relations	Beta	Err.	t	p	Commen- tary
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H1	Artificial Intelligence → Customisation Strategy	0.435	0.073	5.962	0.000	Accepted**
H2	Artificial Intelligence → Place Strategy	0.193	0.076	2.524	0.012	Accepted**
H3	Artificial Intelligence → Pricing Strategies	0.169	0.078	2.183	0.029	Accepted**
H4	Artificial Intelligence → Promotion Strategy	0.128	0.074	1.731	0.084	Rejected
H5	Artificial Intelligence → Website Strategy	0.297	0.072	4.127	0.000	Accepted**
H6	Artificial Intelligence → Privacy Strategy	0.163	0.053	3.112	0.001	Accepted**
H7	Artificial Intelligence → Product Strategy	0.102	0.102	1.405	0.160	Rejected

Note: Significant relationship at values $p^{**} < 0.01$, $p^* < 0.05$

Source: Authors' elaboration based on Smart PLS output

The results presented in Table 3 indicate that artificial intelligence has a significant positive effect on customisation strategy ($\beta = 0.435$, $t = 5.962$, $p < 0.001$), leading to the acceptance of H1. Similarly, significant positive effects were found for place strategy ($\beta = 0.193$, $t = 2.524$, $p = 0.012$), pricing strategy ($\beta = 0.169$, $t = 2.183$, $p = 0.029$), website strategy ($\beta = 0.297$, $t = 4.127$, $p < 0.001$), and privacy strategy ($\beta = 0.163$, $t = 3.112$, $p = 0.001$), supporting H2, H3, H5, and H6, respectively. By contrast, the effect of artificial intelligence on promotion strategy was not statistically significant ($\beta = 0.128$, $t = 1.731$, $p = 0.084$), leading to the rejection of H4. Likewise, the effect of artificial intelligence on product strategy was not statistically significant ($\beta = 0.102$, $t = 1.405$, $p = 0.160$), leading to the rejection of H7. Overall, these findings indicate that AI contributes positively to most dimensions of the e-marketing mix, with the strongest effect observed for customisation strategy, while its influence on promotion and product strategies remains statistically unsupported.

5. Discussion

The findings of this study provide empirical evidence that artificial intelligence (AI) is playing an increasingly important role in enhancing the dimensions of the e-marketing mix within Algerian start-ups. However, its contribution is not equally evident across all marketing strategies. The structural model revealed that AI exerts a positive and statistically significant influence on customisation, website, place, pricing, and privacy strategies, whereas its effects on both promotion strategy and product strategy were not statistically significant. These findings suggest that Algerian start-ups are currently deploying AI primarily in activities centred on data analysis, operational efficiency, and customer relationship management, rather than in marketing functions associated with product innovation, creativity, and strategic communication.

Among the examined dimensions, customisation strategy exhibited the strongest relationship with AI adoption. This finding indicates that AI enables start-ups to analyse customer data more effectively, understand individual preferences, and deliver products, services, and digital content tailored to specific customer needs. Increasingly, start-ups appear to rely on intelligent recommendation systems, behavioural analytics, and automated customer interactions to enhance digital customer experiences and strengthen customer satisfaction and loyalty. This finding is consistent with the studies of Campbell

et al. (2020) and Verma et al. (2021), who demonstrated that AI technologies, particularly predictive analytics and recommendation systems, make a substantial contribution to marketing personalisation and customer experience enhancement. The present study extends these findings by showing that such benefits are not confined to large organisations in developed economies, but can also be realised by Algerian start-ups despite operating under relatively constrained technological and financial conditions. Furthermore, this result supports the Resource-Based View (RBV), which argues that distinctive organisational resources and capabilities are fundamental sources of sustainable competitive advantage. In this context, AI can be regarded as a strategic organisational capability that enables firms to create superior customer value rather than merely serving as a technological tool.

The findings also reveal a statistically significant positive effect of AI on website strategy, indicating that Algerian start-ups are increasingly adopting AI applications to improve website performance and enhance user interaction. This may be explained by the fact that websites have become the primary interface between organisations and their customers in digital environments. Consequently, firms are investing in AI-powered applications such as chatbots, intelligent search functions, and user behaviour analytics to improve user experience and increase the efficiency of their online services. This finding is consistent with Davenport et al. (2019), who argued that AI enhances digital platforms by automating processes and supporting data-driven decision-making, thereby improving the quality of online services. The present study further suggests that website management represents one of the most accessible and widely adopted AI applications among Algerian start-ups because it delivers immediate operational benefits while requiring comparatively modest organisational changes.

The results further demonstrate that AI has a significant positive effect on place (distribution) strategy, highlighting its growing role in improving logistics and supply chain management. The findings suggest that Algerian start-ups have begun to exploit AI technologies to optimise inventory management, coordinate distribution activities, and monitor delivery operations more efficiently. These improvements contribute to greater operational efficiency, lower distribution costs, and more reliable customer service. This result is in line with the findings of De Carlo et al. (2021), who reported that AI applications substantially improve logistics performance and distribution efficiency. The current study extends this evidence by showing that these operational advantages are not limited to large corporations but are equally relevant to start-ups operating in emerging economies, where improving efficiency with limited resources is often a strategic priority.

A statistically significant positive relationship was also identified between AI and pricing strategy, suggesting that Algerian start-ups increasingly rely on AI to support pricing decisions through the analysis of customer behaviour, market conditions, and competitor activities. Predictive models and machine learning algorithms enable firms to estimate customer responses, forecast market demand, and identify pricing alternatives that balance competitiveness with profitability. This finding supports the work of Nanayakkara (2020), who demonstrated that AI enhances dynamic pricing capabilities and improves the accuracy of pricing decisions in digital markets. The present findings indicate that AI is becoming an effective decision-support tool that enables start-ups to replace intuition-based pricing decisions with approaches grounded in data analytics and predictive modelling.

The study also found a significant positive effect of AI on privacy strategy, reflecting the increasing importance that Algerian start-ups attach to data protection and information security in digital environments. As organisations become more dependent on digital platforms and electronic transactions, protecting customer information has become essential for maintaining trust and ensuring the continuity of digital marketing activities. AI contributes to this objective by detecting security threats, monitoring compliance with data protection requirements, and strengthening data governance practices. Consequently, organisations are able to enhance customer confidence while improving the credibility and security of their digital operations. These findings indicate that Algerian start-ups increasingly perceive AI not only as a marketing tool but also as a strategic resource for safeguarding customer data and reinforcing trust in digital business environments.

In contrast, promotion strategy did not exhibit a statistically significant relationship with AI adoption. This suggests that the use of AI in promotional activities remains relatively limited among Algerian start-ups. One possible explanation is that AI-driven promotional campaigns require extensive datasets, advanced analytical capabilities, specialised expertise, and financial resources that are not yet widely available within many start-ups. Moreover, promotional activities often depend on creativity, brand positioning, and communication strategies that continue to rely heavily on human judgement rather than algorithmic decision-making. This finding differs, to some extent, from studies conducted in technologically advanced economies, where AI has been shown to improve the effectiveness of advertising campaigns, customer targeting, and promotional communication. Such differences highlight the importance of contextual factors, including digital maturity, organisational capabilities, and technological infrastructure, in determining the extent to which AI can support marketing activities.

Similarly, the relationship between AI adoption and product strategy was not found to be statistically significant. This finding suggests that, although Algerian start-ups increasingly recognise the strategic value of AI, its application in product development and innovation remains relatively limited. Product strategy often involves activities such as identifying emerging customer needs, developing new product concepts, improving product features, and managing product innovation processes, all of which require not only advanced AI technologies but also substantial organisational knowledge, research capabilities, and financial resources. Many Algerian start-ups continue to rely on managerial experience, customer feedback, and incremental product improvements rather than AI-driven product design and innovation. Consequently, AI has not yet become an influential determinant of product strategy within these organisations. This result contrasts with evidence reported in several studies conducted in technologically advanced economies, where AI has been shown to accelerate product innovation through customer insight generation, intelligent product design, and market trend forecasting. The discrepancy may be explained by differences in technological maturity, innovation capabilities, and digital infrastructure between developed and emerging economies. Therefore, the current findings suggest that the contribution of AI to product strategy remains contingent upon the availability of complementary organisational resources and the progressive development of innovation capabilities within Algerian start-ups.

Overall, the findings indicate that AI adoption among Algerian start-ups follows a gradual and selective development pattern rather than representing a comprehensive transformation of marketing practices. Organisations currently prioritise AI applications that generate immediate operational benefits and rely heavily on data analysis, while its use in more creativity-oriented marketing functions remains limited. These findings contribute to the growing body of literature on AI adoption in emerging economies by demonstrating that the strategic value of AI depends not only on the technology itself but also on the availability of complementary organisational resources, managerial expertise, and digital capabilities. Accordingly, the study provides empirical evidence that the impact of AI differs across the dimensions of the e-marketing mix, emphasising the need for start-ups to adopt AI strategically in accordance with their organisational capabilities, resource availability, and long-term marketing objectives.

Conclusions

This study examined the influence of artificial intelligence on the dimensions of the e-marketing mix within Algerian start-ups. The empirical findings indicate that AI positively affects customisation, website, pricing, place, and privacy strategies, whereas no significant effects were identified for product and promotion strategies. These results suggest that AI adoption among Algerian start-ups is currently concentrated in data-driven and operational activities that support efficiency and customer interaction.

The study contributes to the growing body of literature on AI and digital marketing by providing empirical evidence from an emerging economy. From a managerial perspective, the findings highlight the need for start-ups to strengthen their technological capabilities and expand the integration of AI into

strategic marketing functions. Greater investment in AI-based innovation, product development, and promotional planning may enable firms to derive broader benefits from these technologies.

Despite its contributions, the study is limited to Algerian start-ups and relies on a cross-sectional research design. Future studies may extend the analysis to other emerging economies, incorporate longitudinal approaches, and examine additional organisational factors that may influence the effectiveness of AI adoption in digital marketing.

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