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The Role of AI Techniques in Enhancing the Quality Management of Digital Marketing Services for Retail Shops

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دور تقنيات الذكاء الاصطناعي في تحسين إدارة جودة خدمات التسويق الرقمي لمحلات البيع بالتجزئة

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مستخلص:

ساهم النمو السريع للمتاجر التي تستخدم تقنيات الذكاء الاصطناعي في تحسين جودة الخدمات في التسويق الرقمي، كما غيّر من طريقة تفاعل الشركات مع عملائها ووصولها إليهم. تُعيد هذه التقنيات تشكيل التفاعلات بين المتاجر والمستهلكين رقميًا، من خلال توفير تجربة أكثر كفاءة وتخصيصًا، وتعزيز التفاعل العميق واتخاذ قرارات شراء مدروسة. تستكشف هذه الدراسة، استنادًا إلى مبادئ إدارة العمليات والجودة، كيف تُحسّن تقنيات الذكاء الاصطناعي جودة الخدمة في التسويق الرقمي، من خلال تأثيرها على تفاعل المستهلكين وقراراتهم الشرائية من المتاجر التي تُقدّم خدمات عالية الجودة في هذا المجال. استُخدمت طريقة المربعات الصغرى الجزئية لتقييم بيانات استبيان شمل ٣٠٠ مشارك. عندما يُؤثر تفاعل المستهلك (المُمثل بالرضا والثقة والولاء) على هذه العلاقة، يكون لتقنيات الذكاء الاصطناعي تأثير إيجابي أكبر على عملية اتخاذ القرار الشرائي. وبالتالي، يتأثر اتخاذ القرار بشكل إيجابي من خلال تفاعل المستهلك. تُؤكد النتائج على أنه لتحقيق تأثير أكبر لتقنيات الذكاء الاصطناعي على عملية اتخاذ القرار، يجب على المستهلك التفاعل معها في البداية. يكشف هذا البحث عن نهجٍ للتفاعل مع المتاجر باستخدام الذكاء الاصطناعي، كما يُبيّن الأثر البالغ لهذه التقنيات على رضا المستهلك وثقته وولائه، مما أحدث تغييرًا في النماذج التقليدية لعملية اتخاذ قرارات الشراء لدى العملاء وعمليات التفاعل مع المتاجر. تُقدّم هذه الدراسة رؤيةً جديدةً للإمكانات الهائلة لهذه التقنيات في التأثير على سلوك العملاء وعلاقاتهم مع المتاجر من خلال تقديم خدمات عالية الجودة في التسويق الرقمي.

الكلمات المفتاحية: جودة الخدمات، تقنيات الذكاء الاصطناعي، خدمات التسويق الرقمي، تفاعل المستهلك، اتخاذ قرارات الشراء

ABSTRACT

The quick growth of shops that using artificial intelligence (AI) techniques has enhanced quality services in digital marketing, as well as changed how businesses interact and reach their consumers. These techniques are digitally reshaping interactions between shops and consumers, by providing a more efficient and customized experience, fostering deeper engagement and more informed decision-making. This study, based on the principles of operation and quality management, explores how AI techniques improve service quality in digital marketing, by affecting consumer interaction and decision-making purchases from shops that provide high quality services in digital marketing. The partial least squares method was used to evaluate data from a survey with 300 respondents. When consumer engagement represented by (satisfaction, trust, loyalty) mediates this relationship, artificial intelligence (AI) techniques have a more favorable impact on purchasing decision-making. Consequently, decision-making is positively impacted through consumer engagement. The findings emphasize that for a bigger impact of the (AI) techniques on decision-making, the consumer must initially interact with them. This research reveals approach of AI-supported shop engagements, it also illustrates the powerful impact of techniques on consumer satisfaction, trust, and loyalty, thus, it brought about a change in the typical models of customer-purchase decision-making and shop engagement processes. This study delivers

new vision into the tremendous potential of these techniques in influencing customer behavior and shop relationships through quality services in digital marketing.**Keywords**: Quality of services, (AI) techniques, digital marketing services, Consumer engagement, purchasing decision-making.

1. INTRODUCTION

Artificial intelligence is widely viewed as a system that shows intelligent behavior by evaluating the environment and implementing appropriate actions Sheikh, H, (2023). The significance of artificial intelligence, a rapidly developing technique, on marketing services is unquestionable. It refers to technique that enables machines or computers to perform tasks requiring human like intelligence Hermann, E. et al., (2024). The ability to fulfil is linked to actions that resemble those carried out by the human brain. It has been used to provide high-quality marketing services, and help firms more easily reach consumers at the appropriate moment as stated by Joshi, S et al. (2025) In response to this shift, new techniques have unlocked a vast realm of opportunities, enabling shops to enhance operational efficiency and deepen consumer relationships Ravić et al., (2022). Machine learning (ML) and artificial intelligence (AI) techniques stand out among the new techniques because they give marketers the ability to monitor, understand, and forecast consumer behavior on-demand Şentürk et.al. (2023). By grouping their consumers according to their demographics, habits, and interests, shops can also employ AI techniques to automatically create consumer profiles Kempton (2023)Furthermore, sophisticated skills that can replicate and in certain situations, exceed human performance is introduced by AI techniques Gao Y. et al. (2025). These technologies have the potential to drastically change digital marketing services, and boost sales in stores of all sizes. The creation of effective marketing plans is crucial to this change, and is still necessary for success Almaiah et al., (2022)Shops are fighting to get in and keep customers while outsmarting one other because consumers today have a lot of options Arantes, (2023). Shops use a range of strategies to compete with their rivals, including cost leadership, uniqueness, quality, or all of these together. This leads to market penetration, segmentation, and a host of other results Joshi (2021). How stores can benefit is the question. Understanding competitors' capabilities and staying ahead of them is the key to success; this is known as marketing intelligence Ghazi et al., (2023)AI techniques are an effective tool in this field, allowing stores to assess consumer attitudes and emotions on a large scale. Shops can discover new consumer trends, and make well informed strategic decisions, in addition improve consumer service techniques by using AI-driven sentiment analysis. This will ultimately increase consumer pleasure, loyalty, and trust. Bozkurt S et al., (2022). As a result, it's critical to highlight how AI techniques may improve the quality of marketing services and increase productivity, encourage scientific research, establish a department specifically focused on using AI to activate digital marketing services in shops, and Shops can increase this services effectiveness and enhance the consumer experience in line with global trends by utilizing AI techniques Jayasingh, S et al., (2025)Consumer engagement with AI techniques has been recognized as a crucial element in predicting and understanding consumer behavior outcomes, including Consumer purchasing decision-making Hollebeek, L. (2011). Engaged customers on shops pages usually exhibit a positive attitude towards the shops and also show higher Consumer purchasing decision-making to buy Wang, R.J.-H, (2020).Consequently, we will also utilize purchase decision-making as our outcome variable to examine how consumer engagement Customer' decision-making to make purchase .Accordingly, this study aims to the growing body of knowledge on AI techniques role in Enhancing the Quality Management of Digital Marketing Services for Retail Shops by presenting a structured framework that integrates the AI techniques, marketers, and consumer engagement and purchasing decisions, as well as the consumer's viewpoints.This lead to two central research questions:

-What is the impact of AI techniques on purchasing decision-making with shops utilizing AI in Iraq?

- How will AI techniques-have based digital marketing services, influence customer behavior?

To address these questions, 300 responses from Iraqi consumers were collected and examines mediating role of consumer engagement in the relationship between to AI techniques and consumer decision-making. By doing so, it advances understanding of how AI -powered tools shape consumer behavior and supports the strategic application of AI within digital marketing services contexts. The research formation includes the following: Section 1 introduction. Section 2 reviews the relevant literature. Section 3 Develop and create hypotheses. Section 4 Research Method. Section 5 Results. Section 6 discusses. Section 7Conclusion.

2. Literature review

2.1. Digital marketing services

Digital marketing services as a dynamic, technology-enabled process by which businesses collaborate with customers and partners to jointly create, deliver, and sustain value for all stakeholders. As defined by Kannan

and Li (2017). Its evolution was notably accelerated by the birth of the World Wide Web in 1990. Which laid the foundation for a transformative shift in marketing services practices. According to Akgun et al., (2021), and in line with the Digital Marketing Institute (DMI) digital marketing services focuses on using digital technologies to establish high quality and measurable and integrated relationship with customers. The ultimate aim is to acquire, retain, and deepen Consumer engagement through data-driven strategies.As Şentürk et.al. (2023) observe in earlier years, firms had a penchant for employing digital marketing services was a matter of preference. Businesses now need to be in the competition and employ digital marketing techniques to improve quality services, especially after the events such as the COVID-19 pandemic, which has impacted and limited the entire world, wars, and applications that have caused the loss of in-person engagement with customers. Patil KP (2024)Joshi (2021) argues that the last ten years have seen a rapid adoption of modern technology, making customers impatient for anything that can be had quickly, easily, and affordably. Because of this, practically all businesses have had to go through the digitization phase in order to become more automated, productive, and evolving. To provide high-quality services, digital marketing is reshaping consumer and industry behaviors.In the view of Tam, F. Y., and Jane Lung (2025), as well as Sutherland, K (2025), digital marketing services is actively reshaping not only businesses practices but also consumer behavior, reflecting a broader shift in how value is created and consumed in the digital economy.Moreover, Ma X, Gu X. (2024) point out check Small business owners that can no longer withstand economic hardships have given up on physical shops and traditional marketing strategies, and many have only lately started to compete in the online market.As Kotler & Armstrong (2020) explain the digital marketing services entails using technologies like websites, social media, mobile ads and applications, online video, email, blogs, and other digital platforms, additionally, it entails using computers, smartphones, tablets, internet-ready TVs, and other digital devices to interact with customers at any time and from any location.Ma X, Gu X. (2024) explained there are many different digital marketing services (content marketing, social media marketing, search engine marketing) and marketing tools (data analytics, search engine optimization, and marketing automation) that influences a mobile app or web site. Da Silva, D et al., (2023). emphasize marketing any service that can significantly influence people at a certain time, location, and through a specific channel.To sum up, digital marketing services has changed how companies interact with increasingly tech-savvy customers, moving from being a supplemental tool to a strategic need. It allows businesses to react quickly to changes in the market and in the behavior of their customers through personalized and real-time engagement. This fundamental change lays the groundwork for using cutting-edge strategies, especially AI strategies, to improve marketing accuracy and consumer focus.

2.2. Intelligent techniques

The phrase "artificial intelligence" was coined by John McCarthy in 1956. He defined it as "the science and engineering of making intelligent machines, especially intelligent computer programs" and added that it was comparable to the similar goal of using computers to study human intellect, though AI need not be restricted to physiologically observable methods.As noted by Bagnoli C, et al., (2022) the development of artificial intelligence (AI) has drastically altered how industries function, substituting automation and digital solutions for human labor and conventional techniques. AI makes it possible for robots to make wise decisions, which boosts productivity and creativity. The development of automation and robotics in the second half of the 20th century is where artificial intelligence got its start. With the introduction of machine learning and deep learning technologies in the 2010s, however, a real revolution took place. These technologies have made it possible for industries to successfully address difficult issues Sharma, A.P et al., (2024).According to Gao Y. et al. (2025), the usage of artificial intelligence is characterized by people using AI systems to evaluate and learn from outside data and accomplish predetermined objectives and tasks through ongoing improvements. Although many writers have discovered different approaches to AI techniques, we have chosen to concentrate on a select handful for the purposes of this work. A synopsis of the primary techniques is provided below:Natural Language Processing (NLP): Aims to make it possible for computers to understand, generate, and interpret human language in order to gain practical understanding in order to address problems. NLP seeks to accomplish two objectives: (1) extract information from written language; and (2) facilitate human communication I. Taboada, et al. (2023).Machine Learning (ML): goal of create algorithms and models that let computers carry out tasks without direct programming guidance. Machine learning algorithms are made to draw conclusions and learn from data patterns, which enables them to evolve and perform better over time. Supervised learning, unsupervised learning, and reinforcement learning are some of the methods used in this subject. The goal of machine learning is to enable machines to make decisions on their own L. Sharma and P. K. Garg, (2021).Neural

Networks (NNs): these are computational models inspiration for neural networks (NNs). They consist of interconnected nodes organized in layers. NNs use layers of connected neurons to interpret input data. Each neuron executes an activation function after performing a weighted sum of its inputs. Sule, S., (2025)Fuzzy logic (FL): is a mathematical method that deals with reasoning that is approximate rather than exact, enabling the representation of ambiguity and uncertainty in decision-making. By concentrating thought and decision-making on all possible answers between 0 and 1, FL extends Boolean logic (1 or 0). (I. Taboada and others, 2023)Expert Systems (ES): are artificial intelligence (AI) programs that simulate a human expert's decision-making process in a certain field. These systems employ inference engines to draw conclusions and offer suggestions or answers after encoding domain-specific knowledge as facts or rules. Expert systems provide consistent and dependable decision support by capturing and preserving knowledge and experience in particular fields L. Sharma and P. K. Garg, (2021).Chatbots: are artificial intelligence systems created to simulator a natural language conversation with a user by text or audio. It can communicate over the phone, through mobile apps, websites, and messaging services. Furthermore, it is possible to link chatbots with other apps. Cubric, M. (2020)These AI techniques represent the shift from theoretical research to practical application, providing a strong basis for the digital era. The examined literature shows how AI approaches support decision-making in order to increased productivity.

2.3. Artificial Intelligence in Marketing Services

Artificial Intelligence has emerged as an essential tool in developing digital marketing services, by arranging and explanting enormous and various data, collected from digital points of sale. According to Shaik (2023). This assists marketers to make quick decisions driven data, contributes to providing personalized service to consumers, simplifying marketing operations, and ultimately achieving a competitive advantage. Therefore, artificial intelligence is considered a revolutionary force in the field of digital marketing services. Dwivedi YK (2021).Todorova and Antonova (2023) studied AI techniques used in marketing services, included content creation, audience targeting, process optimization, sales promotion, and chatbot. Krishna et al. (2023) emphasized the importance of AI as a key driver of marketing efficiency, highlighting it's ability to foster collaboration between AI and humans as a fundamental element of future marketing services.Cooper (2021) and Agarwal et al. (2023) indicate that the value of AI lies primarily in its support for lean and agile product development methodologies. These approaches aim to reduce waste and enhance efficiency, while AI complements them by shortening innovation cycles, identifying development problems in real time, and providing actionable improvement insights. Babina et al. (2024) support this view by pointing out that AI techniques facilitate real-time data analysis, helping to identify potential challenges and provide improvement strategies, thereby reducing resource waste and accelerating innovation.Furthermore, AI techniques are effective in evaluating user opinions about the functionality of products shared online Kushwaha et al., (2021). This analysis enables companies to better understand consumer needs and make timely improvements Hassan. (2024) .AI algorithms are also used to study consumer preferences and recommend appropriate products and services Mariana, (2025). Raneri et al. (2023) also emphasize the ability of AI techniques to rapidly identify functional requirements for new products and services releases, thus accelerating the "build–test–modify" cycle. As Joshi (2021) noted, this flexibility enables companies to respond quickly to market dynamics and improve both adaptability and competitiveness. Huang and Rust (2021) highlight the growing importance of AI technique's in broader marketing services. They point to its application in various fields, such as consumer service robots, big data analytics for pricing and forecasting, recommendation engines for personalized marketing, natural language processing (NLP) for consumer interaction, and store analytics for monitoring consumer satisfaction. Bozkurt S et al., (2022) Furthermore, Hu et al. (2021) emphasize the dual function of AI technique's: interaction with consumer through natural language while simultaneously collecting valuable data. This dynamic encourages customers to share personal insights in exchange for tailored solutions and recommendations (Whang & Im, 2021). Thus reinforcing the data-driven personalization cycle in modern marketing services.

3. Develop and build hypotheses

First, the relationship between AI techniques and consumer engagement in the shops using digital marketing services

• H1a: AI techniques have a positive impact on consumer satisfaction in shops utilizing digital marketing services.

• H1b: AI techniques have a positive impact on consumer trust in shops utilizing digital marketing services.

H1c: AI techniques have a positive impact on consumer loyalty to shops utilizing digital marketing services.

Second, the impact of AI techniques on consumer purchasing decision-making in shops utilizing digital marketing services

• H2: AI techniques have a positive and significant impact on consumers purchasing decision-making in shops utilizing digital marketing services.

Third, the impact of consumer engagement with shops utilizing digital marketing services on consumer purchasing decision-making

• H3a: Consumer satisfaction in AI techniques driven shops positively impacts purchasing decision-making in the subject of digital marketing services

• H3b: Consumer trust in AI techniques driven shops positively impacts purchasing decision-making in the subject of digital marketing services.

• H3c: Consumer loyalty toward AI techniques driven shops positively impacts purchasing decision-making in the context of digital marketing services**.**

Fourth, the mediating role of consumer engagement with shops utilizing digital marketing services confirms the positive connection between AI techniques on consumer purchasing decision-making

• H4a: The positive effect of AI techniques on purchasing decision-making in shops utilizing digital marketing services is mediated by consumer satisfaction.

• H4b: The positive effect of AI techniques on purchasing decision-making in shops utilizing digital marketing services is mediated by consumer trust.

• H4c: The positive effect of AI techniques on purchasing decision -making in shops utilizing digital marketing services is mediated by consumer loyalty. Then, the following hypothesises was posited in (Fig. 1).

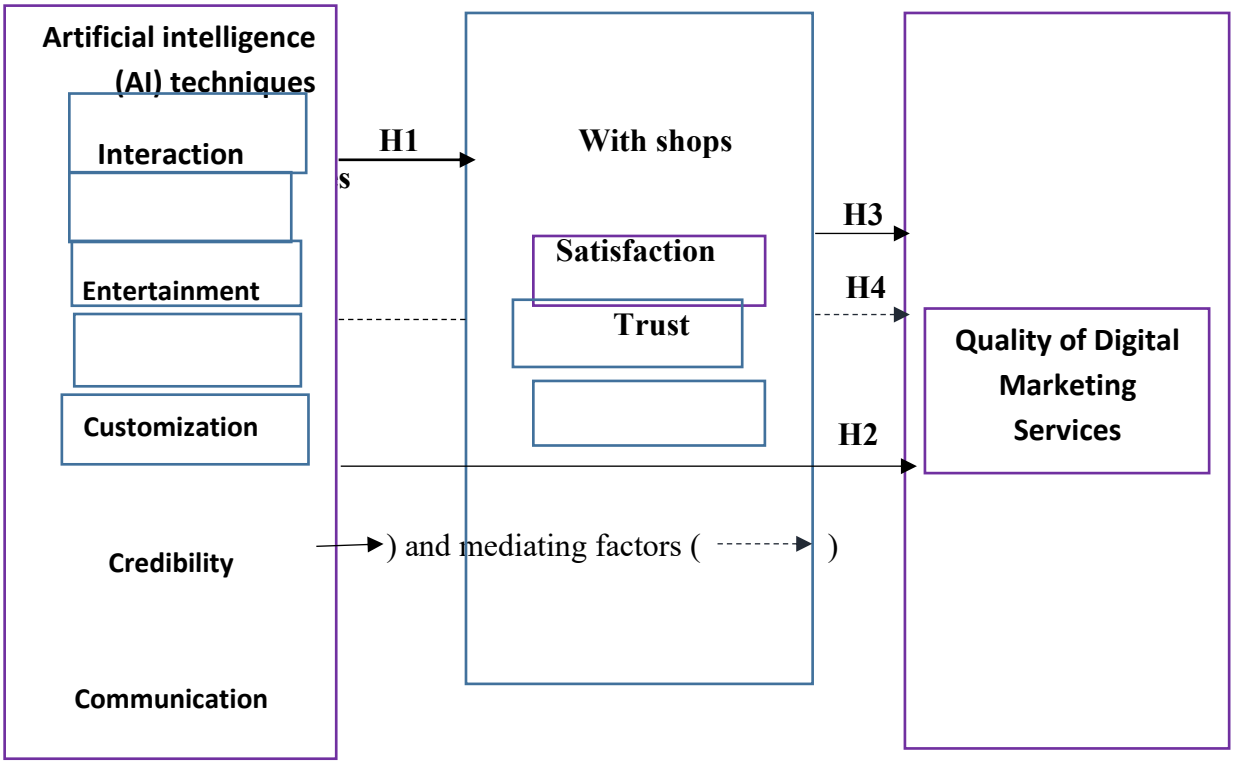


Fig. 1 Research model and hypotheses.

4- Research Method

4.1 Measures and the Sample

The information used in this study was gathered during February and March 2025 utilizing a survey conducted online, the link to which was shared via the author's social networks and personal contacts. Accordingly, a non-probability convenience sampling technique was employed. The target population comprised Iraqi consumers. The criteria for participation required that respondents: (i) be a resident of Iraq and at least eighteen years old. And (ii) have bought at least one item. From a shop utilizing artificial intelligence (AI) techniques within the past year. A total of 300 valid responses were obtained, forming the final sample that fully satisfied these

conditions.Participation was unnamed, and informed consent was secured from all respondents prior to questionnaire completion. To ensure clarity from the items and determine the mean answer time, a preliminary experiment was conducted with pilot group of 10 participants. The results of this pilot indicated an average completion time of approximately five minutes, with no reported comprehension difficulties.The questionnaire comprised three main section (details in Appendix A.1), adapted Gomes and Lopes (2025). In the first section, respondents were instructed to: "Think of a product purchased from an online store that uses AI techniques. Answer the following questions based on this experience". this part measured five AI related constructs: (i) Interaction (3 items); (ii) Entertainment (4 items); (iii) Customization (4 items); (iv) Communication (3 items); and (v) Credibility (3 items). The second part assessed consumer interaction with online shops employing AI, consisting of three constructs: four items for satisfaction, five items for trust, and four items for loyalty.The final part measured consumer purchasing decision-making concerning AI-driven shops using three items. All items across the questionnaire were evaluated on a 5-point Likert scale ranging from, 1 (Strongly Disagree) to 5(Strongly Agree), with the exception of purchasing decision-making items. these were assessed through three distinct 5-point Likert sub -scales:1 (Improbable) to 5 (probable); 1 (Impossible) to 5 (Possible); 1(Dislike) to 5 (Like).

4.2. Research methodology

The methodology used in this study was quantitative. Initially, using a SPSS software (v. 25). statistical analysis was conducted on items measured the constructs. Following this was items were then categorized into factors using, an exploratory factor analysis (EFA), and factor and loadings and the reflective nature of the study methodology were evaluated using a Confirmatory Factor Analysis (CFA). Then, using Smart PLS (v. 4.0) software, the Partial Least Square (PLS) technique was used to the study strategy. this approach integrates regression estimation with factor analysis based on the Ordinary Least Square method, According to Lee et al. (2022).When the primary objective of a study is model exploration, as in This research, PLS-SEM is considered more appropriate both theoretically and practically, PLS-SEM functions similarly to multiple regression analysis, with the primary goal of maximizing the explained variance in dependent variables and assessing data quality based on measurement model characteristics Dash G, Paul J (2021). Furthermore, PLS efficiently assesses intricate cause and effect relationships after implementing the PLS logarithm on the research approach, it was assessed for discriminant validity, reliability and, convergence Hair J, et al. (2022).to evaluate dependability and convergence, the following were considered:

• Average Variance Extracted (AVE > 0.50)
• Composite Reliability (CR > 0.70)
• Cronbach's Alpha (Cα > 0.70)

Utilizing the Heterotrait–Monotrait (HTMT) ratio (< 0.85), discriminant validity was examined which indicates perfect discriminant validity. Additionally, the model's fit quality path coefficients significance, explanatory power, and predictive relevance were assessed, evaluating these key indicators helps mitigate the risk of interpreting results due to non-representative sample Benitez J. et al. (2020). Lastly, the relationships in the research were estimated using bootstrapping analysis in Smart PLS (v. 4.0).

5.Results

5.1.Sociodemographic characterization of participants

The final sample comprised of 300 Iraqi consumer's aged 18 years and above, who had made at least one online purchase from a shops utilizing AI-based service within the previous year. of participants are female (68.25%), with an average age of (27.16) years (ranging from 18 to 60 years). 66.4% are students, and 29.2% are employees.

5.2 statistical description

Table 1 provides a thorough statistical description of all measured constructs. for constructs related to AI techniques, participants demonstrated the highest levels of agreement with the following dimensions:

• Credibility (M = 4.76), • Entertainment (M = 4.72), • Interaction (M = 4.72). With respect to consumer engagement constructs, the highest mean score was observed for loyalty (M=4.72),

Indicating a strong of loyalty towards online stores that apply AI techniques.

Similarly, participants showed consistently high agreement levels with items measured customer purchasing decision-making in AI- supported shopping services, reflecting a positive influence of AI technique on their purchase related decision.**Table 1: Statistical Description of construct items**

Constructs	Items	Mean	Std. d

(AI) techniques	**Entertainment (ENT)**	**4.72**	**0.748**
	ENT1	4.76	0.630
	ENT2	4.72	0.719
	ENT3	4.71	0.740
	ENT4	4.69	0.833
	Interaction (INT)	**4.72**	**0.703**
	INT1	4.74	0.700
	INT2	4.71	0.686
	INT3	4.72	0.722
	Credibility (CRE)	**4.76**	**0.766**
	CRED1	4.69	0.746
	CRED2	4.67	0.779
	CRED3	4.65	0.772
	Communication (COM)	**4.64**	**0.769**
	COM1	4.69	0.713
	COM2	4.61	0.824
	COM3	4.64	0.771
	Customization (CUS)	**4.69**	**0.757**
	CUS1	4.70	0.746
	CUS2	4.68	0.795
	CUS3	4.67	0.783
	CUS4	4.70	0.705
Consumer engagement	**Satisfaction (SAT)**	**4.70**	**0.720**
	SAT1	4.73	0.686
	SAT2	4.72	0.706
	SAT3	4.69	0.722
	SAT4	4.67	0.767
	Trust (TR)	**4.70**	**0.730**
	TR1	4.73	0.702
	TR2	4.71	0.772
	TR3	4.69	0.744
	TR4	4.70	0.715
	TR5	4.69	0.719
	Shops loyalty (SL)	**4.72**	**0.719**
	SL1	4.70	0.719
	SL2	4.71	0.727
	SL3	4.74	0.669
	SL4	4.74	0.760
Purchasing decision	**Purchase intention (PI)**	**1.95**	**1.438**
	PI1	1.98	1.385
	PI2	1.92	1.478
	PI3	1.95	1.453

5.3. Factor analysis

The outcomes of the EFA and CFA are shown in Table 2. Based on the EFA, the items were grouped into two distinct factors consistent with the proposed research model.The accumulated explained variance of these factors reached 63.8%, no single factor exceeding 50% variance indicating a balanced distribution among the factor. Furthermore, all items displayed adequate communalities (greater than 0.40), suggesting satisfactory representation within their respective factors. The Confirmatory Factor Analysis results showed that all elements exhibited statistically significant uniform factor loads (above 0.50). accordingly, no element needed to be removed from the model, supporting the reflexive measurement structure proposed in this study. **Table 2: Results of Exploratory and Confirmatory Factor Analyses (EFA, CFA)**

constructs	items	FACTOR1	FACTOR2	Communalities

(AI) techniques	**Entertainment (ENT)**			
	ENT1	٠,٦٦9		0.491
	ENT2	0.727		0.680
	ENT3	0.722		0.697
	ENT4	0.659		0.606
	Interaction (INT)			
	INT1	٠,٧01		0.631
	INT2	.٠719		0.546
	INT3	٠,٦44		0.447
	Credibility (CRE)			
	CRED1	0.693		0.710
	CRED2	0.678	٠,٥٥٣	0.766
	CRED3	0.700		0.731
	Communication			
	(COM)	٠,٧٢1		0.578
	COM1	0.614		0.628
	COM2	٠,٦53	0.510	0.503
	COM3			
	Customization (CUS)	0.710		0.710
	CUS1	0.623		0.623
	CUS2	0.635		0.635
	CUS3	0.526		0.526
Consumer	CUS4			
engagement	**Satisfaction (SAT)**	0.753		0.686
	SAT1	0.779		0.753
	SAT2	0.764		0.701
	SAT3	0.570	٠,٥٥٩	0.637
	SAT4			
	Trust (TR)	0.705	0.502	0.749
	TR1	0.696	0.500	0.734
	TR2		0.675	0.698
	TR3		0.623	0.633
	TR4	0.609	0.617	0.752
	TR5			
	Shops loyalty (SL)	0.604	0.524	0.639
	SL1	0.597	0.666	0.800
	SL2	0.679	.٠557	0.771
	SL3	٠,٥79	0.678	0.795
Purchasing decision	SL4			
	Purchase intention		0.552	0.208
	(PI)		٠,٥٥1	0.356
	PI1		0.550	0.326
	PI2			
	PI3			

5. 4 Convergence, Validity, and Reliability Tests

Table 3 summarizes the outcomes of the measurement model assessment. The model offers reliability and convergent, as appeared by the obtained coefficients: Cronbach's alpha (Cα) > 0.70, Composite Reliability (CR) > 0.70, and Average Variance Extracted (AVE) > 0.50, Hair J, et al. (2022). In terms of discriminant validity, the model it fulfills that, since all correlation coefficients remain below 0.85, Benitez J. et al. (2020). Model shows good enough as stated by the next metrics: Hair J, et al. (2022).

- Chi-Square test (p = 0.0762)
- Goodness-of-Fit Index (GFI) of 0.93 (recommended > 0.90)
- Comparative Fit Index (CFI) of 0.91 (recommended > 0.90)

• Standard Root Mean Square Residual (SRMR) of 0.057 (recommended < 0.08)

Additionally, the variance inflation factor (VIF) was assessed to detect potential collinearity issues. The highest VIF value observed was (3.505) for the item "SL1", indicating that collinearity does not pose a concern for the model.**Table 3: Measurement Model Evaluation Results**

	Ca	CR	AVE	AI	PDM	SAT	TR	SL
(AI) techniques	0.963	0.981	0.707					
Purchasing decision making (PDM)	0.758	0.871	0.758	0.730				
Satisfaction (SAT)	0.901	0.949	0.811	0.703	0.261			
Trust (TR)	0.919	0.٩٤٩	0.844	0.769	0.284	0.625		
Shops Loyalty (SL)	0.927	0.927	0.859	0.740	0.245	0.598	0.667	

The findings relating of the path coefficients' importance and pertinence, evaluated using R^2 values, are summarized in Table 4. All dependent constructs exhibit a significant impact, with R^2 values exceeding (0.21), According to Cohen J (2013). By using the Stone-Q2 Geisser's statistic, computing structural model's predictive validity. All of the dependent constructs' Q2 values were higher than zero, indicating that the model had adequate predictive relevance.**Table4: Significant and predictive relevance**

	R^2	Q^2
Purchasing decision	0.533	0.422
Satisfaction	0.508	0.398
Trust	0.591	0.480
Shops Loyalty)	0.548	0.437

5.5 Estimation of the Research Model

Table 5 summarizes the outcomes of applying the bootstrapping analysis to estimate the relationships between the variables identified in the research model.

The findings indicate that AI techniques exert a positive influence on consumer engagement with shops that offer digital marketing services. Specifically, AI techniques were strongly associated with increased levels of consumer trust (β = 0.972), satisfaction (β = 0.970), and loyalty (β = 0.982), thereby supporting Hypotheses H1a, H1b, and H1c.

Additionally, AI techniques were found to have a positive direct effect on consumer purchasing decision-making (β = 0.084), which confirms Hypothesis H2.

-The analysis also showed that consumer engagement items had a big impact on purchasing decision –making. Among these, trust demonstrated the strongest effect (β = 0.094), then loyalty (β = 0.087), finally satisfaction (β = 0.080). these finding confirm hypotheses H3a, H3b and H3c.

Additionally, the findings confirmed that consumer engagement had a mediating effect in the relationship between AI techniques and purchasing decisions. This mediating effect assured hypotheses H4a, H4b, and H4c, and also increased the power of the correlation, refers to influence of AI techniques on purchasing decision-making becomes more strong when consumer engagement is taken into account as a mediator.

Table 5: Mediating and direct impacts

Variables	Path (β)	t value (Bootstrap)	P values	Confidence interval		Hypothesis support
				2.5%	97.5%	
Direct effects						
H1a: AI techniques → satisfaction	0.970	40.557	0.000	-0.828	1.111	yes
H1b: AI techniques → trust	0.972	40.754	0.000	-0.833	1.112	yes
H1c: AI techniques → Shops Loyalty	0.982	36.834	0.000	-0.086	0.264	yes
H2: AI techniques → Purchasing decision	0.084	8.598	0.000	-0.061	0.108	yes
H3 a: Satisfaction → Purchasing decision	0.080	8.797	0.000	-0.056	0.104	yes
H3 b: Trust → Purchasing decision	0.094	10.960	0.000	-0.072	0.116	yes
H3 c: Shop loyalty → Purchasing decision	0.087	10.283	0.000	-0.065	0.113	yes
Mediating effects						
H4 a: AI techniques → Satisfaction → Purchasing decision	0.690	18.321	0.000	0.549	0.831	yes

H4 b: AI techniques → Trust → Purchasing decision	0.774	21.332	0.000	0.833	1.111	yes
H4 c: AI techniques → Shops loyalty → Purchasing decision	0.723	20.153	0.000	0.548	0.898	yes

6. Discussion

This study provides important information about how AI techniques impact consumer engagement and purchasing decision, and enhancing the quality of digital marketing services. The findings support the conclusions of earlier research, by showing that AI techniques play an essential role in improving customer satisfaction, enrich trust, and fostering loyalty, thereby creating a holistic engagement experience between consumers and shops, as mentioned Lu L et al. (2022).These results demonstrate the strategic significance of relationship between AI techniques and consumer engagement with digital marketing services. And also the noticeable positive correlation between AI techniques and purchasing decision-making aligns with previous research, which have indicated that AI techniques enhances consumers' purchase decisions and influences product selection processes. Therefore, investing in advanced AI techniques emerges as a successful strategy for merchants looking to influence consumer choices and promote purchase actions.Additionally, it has been noted that the engagement of consumers with shop that using digital marketing services has a positive influence on decision purchases. This important impact on consumers' purchase decisions has been found in a number of consumer engagement elements, based on engagements with AI techniques, which involving the satisfaction, trust, and loyalty, as noted by Jiang H. et al. (2022).Furthermore, the study found that consumer engagement acts as a role mediating factor between AI techniques and purchasing decision. It was discovered that elements like loyalty, trust, and satisfaction made a substantial contribution to this mediation process. Specifically, trust had the biggest impact on decisions about what to buy, followed by loyalty and satisfaction. According to this, building trust is still crucial in evaluating whether or not customers are ready to make actual purchases.The results further emphasize the unique role of every engagement dimension. Trust acts as a psychological bridge between consumers and shops utilizing digital marketing services, boosting trust in the veracity of the digital platforms as well as the information supplied by AI techniques. Loyalty, on the other hand, shows a consumer's sustained dedication, which positively affects the intention to repeat purchases. Satisfaction demonstrated a relatively lower direct effect, which may be explained by the fact that it is cumulative nature requiring consistent positive experiences over time, as opposed to loyalty and trust, which appear frequently as instant reactions to satisfying experience, Balakrishnan J. (2018), pointed out that.An important contribution of this study, is the explanting how consumer engagement has a positive mediating effect, which increases the impact of AI techniques on consumer decision-making. When AI-driven services match with consumer expectations and preferences, they facilitate a more satisfying and customized interaction, which increasing consumers' willingness to engage with and purchase from shops that use digital marketing services. However, there are serious worries about possible future hazards when AI techniques is used in business-to-consumer engagement. There are concerns that these techniques may outsmart humans and have an impact on decision-making because of their unusual speed and capacity to retain large quantities of behavioral data, "According to Pelau et al. (2021). Overuse of AI techniques can increase the possibility of consumer deception, can cause accreditation on these techniques damage social connections and decrease cognitive capacities, change personality processes and thought.

6.1 Future research directions

The link between consumer engagement and purchase decision-making should be moderated in future research by using sociodemographic factors (e.g., age, gender, education, and income) and obtaining a representative probability sample.Shop loyalty and preference may also be employed as customer engagement factors in future research. Additionally, future research would involve identifying a particular store that employs AI techniques and investigating the features of those techniques as well as the experience, interaction, and purchasing decisions of that shop's clientele.Future study might benefit from examining how past experiences with AI techniques function as a mediator in the correlation between consumer engagement and purchase decisions. Studying AI techniques in various cultural contexts or with various technical interfaces would also be crucial.
As a result, it would be crucial, for example, to assess which aspects of an AI techniques (language, appearance, and voice) are optimal approvable in difference cultures and whether there is a diversity in the style difference cultures refers to intentions or emotions to AI techniques.Furthermore, given the multiplicity of technological interfaces, it would be crucial to investigate, for instance, how different written, visual, and auditory content

interfaces perceive techniques; whether multimedia engagement the mixture of voice, visual, text raise or reduce the influence of techniques; and if sophisticated interfaces have a greater impact on customers' feeling or trust. Given the variations in Products types, it should be crucial for following research to examine if the effects of AI techniques differ based on the kind of service (entertainment, banking, health care) or goods (long-lasting versus short-lived consumer goods) and determination which stages of marketing services are most work best for various product categories.

7. Conclusion

The growth of shops employing AI techniques has transformed consumer behavior and decision-making within digital marketing services. This study investigates how AI techniques affect consumers' engagement with shops that employ digital marketing services and how they purchasing decision-making. The finding confirm that greater user of AI techniques greatly boosts consumer satisfaction, trust, and loyalty to shops that employ them. Additionally, it influences consumers 'purchase decision. The result proved that consumer's engagement with shops that utilize AI techniques, specifically trust, increases their purchasing decision-making. consumer's engagement plays a crucial mediating role, intensifying the relationship between AI techniques and consumer purchasing decision. So, it essential to strengthening satisfaction, trust and loyalty

To the shop, for AI techniques to more important impact consumer purchasing decision.

Appendix A.1 – Questionnaire

The full questionnaire used to collect data in this study is available at:
https://docs.google.com/document/d/1-rfIjUaW6qB1SCtybyANmevAu_xpR9w9/edit

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