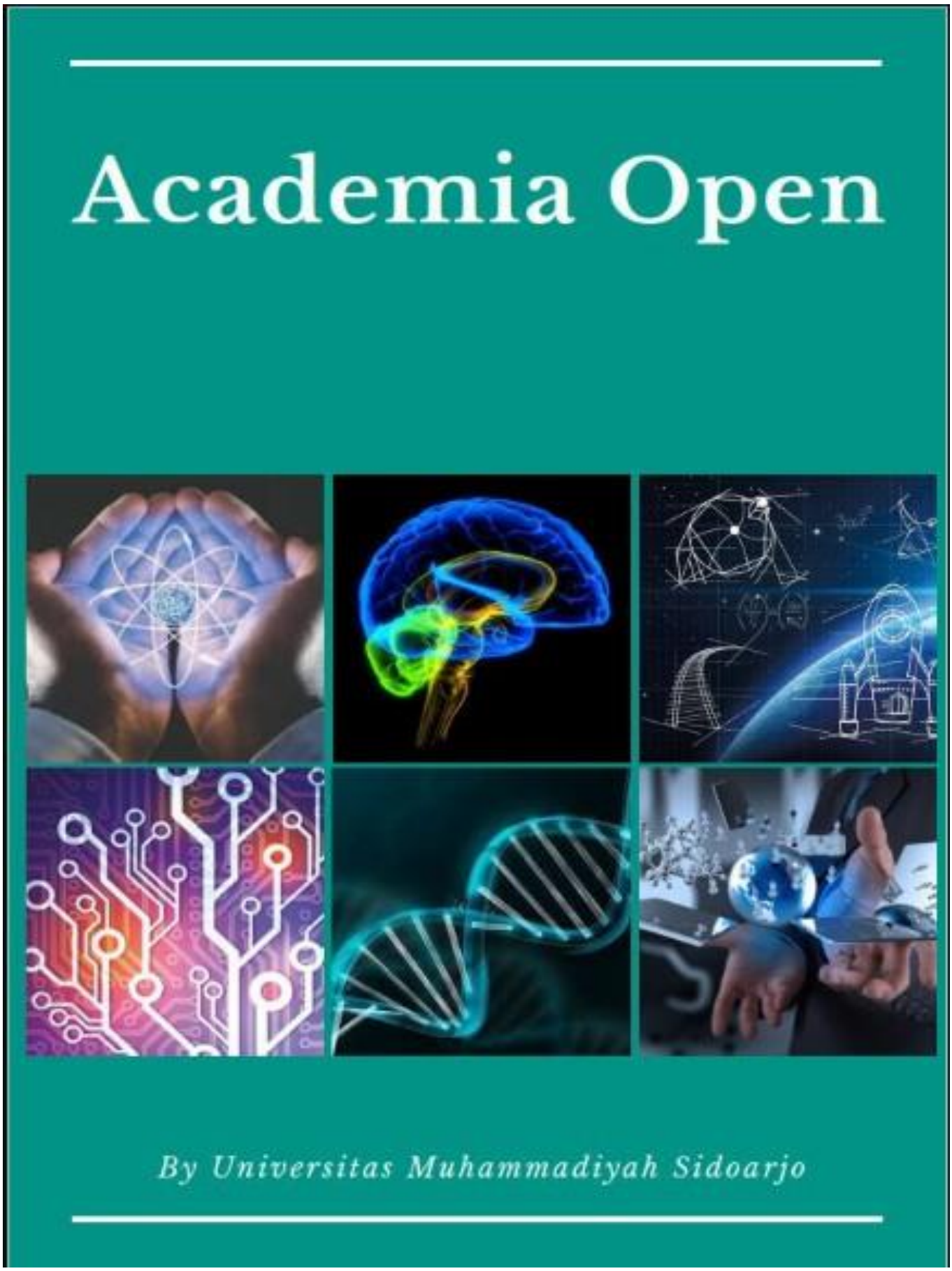
Academia Open

Vol. 11 No. 1 (2026): June
DOI: 10.21070/acopen.11.2026.14720



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Academia Open

Vol. 11 No. 1 (2026): June
DOI: 10.21070/acopen.11.2026.14720

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Academia Open

Vol. 11 No. 1 (2026): June
DOI: 10.21070/acopen.11.2026.14720

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Academia Open

Vol. 11 No. 1 (2026): June
DOI: 10.21070/acopen.11.2026.14720

Article information

Check this article update (crossmark)

Check this article impact (*)

Save this article to Mendeley

(*) Time for indexing process is various, depends on indexing database platform

Academia Open

Vol. 11 No. 1 (2026): June
DOI: 10.21070/acopen.11.2026.14720

Integrating Artificial Intelligence and Human-Centered Marketing in Iraq

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Abstract

General Background Digital technologies and advanced artificial intelligence have transformed communication paradigms between organizations and consumers over modern digital platforms. Specific Background Within emerging economies undergoing digital transformation, businesses deploy automation alongside relational marketing. **Knowledge Gap** However, prior empirical research has treated artificial intelligence and human-centered strategies as isolated mechanisms. **Aims** This study investigates their combined effects on sustainable consumer engagement within the Iraqi market**. Results** Structural equation modeling from 400 respondents demonstrates that their integration yields the most powerful positive effect ($\beta = 0.52$), mediated by digital trust and moderated by ethical sustainability. **Novelty** This research establishes an empirical framework for Marketing 5.0, proving engagement is a socio-technical outcome. Implications Practically, managers must prioritize transparency, data privacy, and ethical alignment to build long-term trust.

Keywords: Marketing 5.0, Artificial Intelligence, Human-Centered Strategies, Digital Trust, Sustainable Consumer Engagement

Key Findings Highlights
The combined integration of artificial intelligence and human-centered methods yields stronger consumer engagement outcomes than relying on either strategy independently.
Digital trust serves as a critical partial mediator that translates technological capabilities into long-term relational value.
Ethical sustainability acts as a crucial boundary condition that significantly reinforces the positive impact of human-centered strategies.

Published date: 2026-07-01

Academia Open
Vol. 11 No. 1 (2026): June
DOI: 10.21070/acopen.11.2026.14720

1. Introduction

The concepts of today's marketing were transformed by new digital technologies and Artificial Intelligence (AI), which has altered the nature of the marketing communication between the organization and consumers and the way value is created. It is no longer a race on product, price and efficiency of distribution; it's a race on designing intelligent, personalized and trustworthy engagement experiences over digital platforms. This shift has helped to shape a new thinking in marketing with a focus on technology and data.

It is very much linked with the evolution of technology and consumer behaviour. Consequently, in the past couple of years alone, the digital nature of how organizations create, deliver and add value to their customers has revolutionized, with the help of AI, big data analytics and intelligent automation. These developments have taken marketing beyond the digital connectivity towards more intelligent, predictive, and adaptive systems that learn from the consumer data and behaviors (Venkatesh, Thong, & Xu, 2021; Kumar et al., 2020).

In this context, Marketing 5.0 has become an innovative marketing paradigm, combining new technologies with human-centered marketing. In contrast to the past digital marketing methods that were mostly focused on the efficiency and automation of the process, Marketing 5.0 has placed emphasis on the need to combine the advantages of the AI technology and the human touch with empathy, trust, ethical values and social responsibility (Kotler, Kartajaya & Setiawan, 2021). This paradigm is representative of the shift of thinking that more sophisticated technology is not enough to achieve long-lasting consumer engagement, especially in a space where consumers have growing expectations and digital uncertainty.

Based on the recent empirical evidence, it is argued that AI usage in personalization, responsiveness, and accurate decision-making also demonstrates that dependence on trust in digital systems and ethical conduct of AI applications is essential to achieve long-term consumer engagement (Wang, Yu, & Fesenmaier, 2022; Puntoni et al., 2021). Meanwhile, research on human centered marketing strategies is devoted to improving the customer's experience, transparency and value alignment, which are all essential components to a long-term engagement and relationship stability (Lemon & Verhoef, 2021; Verleye, 2020). These research streams complement each other to give theoretical support for the study of the integrative logic of Marketing 5.0. In tandem with the technological wave, there is also a large body of literature on the human-centred elements of marketing that has concentrated on the design of customer experiences, personalisation, trust and transparency and ethical and social values.

The strategies are directed towards building relationships, trust and commitment between firms and consumers. Theories on relationship marketing and consumer engagement have repeatedly asserted that only meaningful interactions that are based on a firm foundation of fairness, credibility and value alignment can create sustainable engagement, not just transactional interactions.

Although these have been advancements, the current research has some key gaps. First, there is a large amount of literature that views the use of AI applications and human-centred approach are two distinct sources of marketing outcomes, which leads to the occurrence of disjointed explanations of consumer engagement. Secondly, empirical research does not typically look into how AI-driven marketing contributes to ongoing engagement, especially digital trust as an intervening variable. Third, the term ethical sustainability is often considered normatively, rather than being tested empirically as a determinant of the effectiveness of human-centred approaches.

In emergent markets these restrictions are particularly strong, as technology uptake can be faster than institutional development and citizens' confidence. In markets such as Iraq, there is an increasing trend for digital marketing and use of AI based apps, because of the competition. However, there remains a lack of uniformity in consumers' technological awareness and concerns around data privacy, transparency and ethics remain. This raises the question whether there's any potential for AI marketing campaigns to create long-term consumer engagement.

Preliminary results of the Iraqi market show that the use of Artificial Intelligence applications is perceived moderately by the consumers while they are not interested in the applications to the desired level. However, human centered aspects, notably trust, transparency and ethical values seem to have greater impact on the outcomes of engagements. The patterns suggest that technology adoption will not maintain consumer engagement without establishing trust and ethically sound practices. The observations reveal the importance and necessity of an integrative empirical study focused on technological and human aspects in one package.

This study will, therefore, set out to explore the effect of the application of artificial intelligence in marketing and human-centred strategies on sustainable (consumer) engagement in the context of Marketing 5.0. In particular, the study explores the direct impact of AI applications and human-centric strategies on engagement results, the role of digital trust as a mediator, and the role of ethical sustainability as a moderator. The study aims to move the Marketing 5.0 literature beyond the developed environment by targeting the Iraqi market as a new digital economy and offer theory and practice relevant empirical insights.

2. Research Gap and Contributions

2.1 Research Gap

Although there is strong academic interest in the concept of Marketing 5.0, literature analysis has shown that there are still some gaps that hinder a clear understanding of its operation in practice, especially in emerging markets.

First, current studies have largely focused on the use of artificial intelligence or the marketing strategies of human beings as isolated means of improving marketing performance. Research on AI in marketing stresses efficiency, automation, predictive accuracy, and personalization results, while research on relationship marketing and consumer engagement literature focuses on trust, experience, and ethical values. This division has led to a disintegration of theoretical explanations that do not reflect the interactive and integrative nature of Marketing 5.0, which stress the need to connect technological intelligence with human values.

Second, while consumer engagement has received a significant amount of research, most empirical studies have been conducted on short-term or transactional consumer engagement (satisfaction, purchase intention), and not on consumer engagement as a long-term relational construct. Furthermore, there has been a lack of research on the impact of AI-driven marketing strategies over the long-term to maintain consumer engagement, particularly in the context of rapidly evolving consumer trust in digital platforms.

Third, although digital trust has long been acknowledged as an essential element in the adoption of technology and digital interactions, as a root cause of the impact of AI applications on sustainable consumer engagement, it has not been studied enough. It is common that prior studies regard trust as an antecedent or outcome but little empirical research has been conducted to examine the mediating effect of trust in an integrated marketing process.

Fourth, ethical and social issues are often times addressed in the literature of Marketing 5.0 in a normative or conceptual manner, with the empirical evidence on ethical sustainability as a moderating condition being underutilized. Few studies have investigated if ethical sustainability has a positive or negative impact on the effectiveness of human-centered strategies to influence engagement outcomes, especially in markets that have institutional uncertainty and ethical sensitivity.

Lastly, most empirical research in this area has been carried out in more developed economies, in which digital infrastructures, regulations, and levels of consumer trust are more advanced, and this can lead to findings that are less relevant in developing economies. Therefore, it is uncertain whether the models of the "marketing 5.0" era are applicable in emerging markets such as Iraq. The impact of AI programs on consumer reactions may be substantial, particularly in these contexts, where there is a lack of technological familiarity, greater reliance on relational cues, and heightened transparency and ethics concerns.

These restrictions highlight the potential for an integrative empirical model that incorporates the application of AI and human-centric approaches in order to explain sustainable consumer engagement in emerging market situations, while controlling for the moderating effect of ethical sustainability and acknowledging the mediating role of digital trust.

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo

2.2 Research Contributions

This study aims to fill the research gap identified and has several original contributions to the marketing theory and practice.

In this research, an integrative framework is proposed and examined which combines the application of the AI with the human-centred marketing approaches in order to explain the sustainable consumer engagement.. The study shows that sustainable engagement arises out of a synergy between technological capabilities and human values, not just one or the other.

Second, mechanism-based contribution.

The study adds to consumer engagement and digital marketing research by providing empirical validation of the mediating effect of digital trust. The results provide a light on the nature of how AI-based marketing practices serve to build trust and lead to sustainable engagement results, thus supplementing trust-based theories in technology-mediated marketing situations.

Third, boundary-condition contribution.

The study examines ethical sustainability as a moderating variable to further the ethical marketing literature beyond a normative perspective and offers empirical evidence of when and how human-centered strategies are most effective. Ethical sustainability is one of the most important boundary conditions highlighted in this contribution that can boost the effectiveness of relational marketing practices.

Fourth, contextual contribution.

The research takes a new focus on Iraq as a new digital market to extend the geographic area of the research of Marketing 5.0. The findings provide insights into consumer behavior in contexts where there is differential technological awareness and low digital trust, thereby enhancing the external validity and context-relevance of the theories that have been developed so far.

Fifth, practical contribution.

The study offers timely input to management that can be used towards decision making for emerging markets. The results indicate that there is a need for actions based on trust-building and ethically sound approaches that involve the humans, as well as investing in technologies with an AI component in order to have a sustainable consumer engagement to achieve competitive advantages in the long term.

3. Theoretical Framework and Hypotheses Development

3.1 Marketing 5.0 as an Integrative Theoretical Framework

Marketing 5.0 follows the logic of evolution of marketing, a step by step gradual shift from product thinking, transaction thinking to more relational, value-driven, technologically enhanced marketing. Marketing 5.0 is the next phase in the evolution of marketing, marking a shift from technology-driven marketing to marketing that also emphasizes human values with advanced digital technologies to create sustainable value (Kotler, Kartajaya, & Setiawan, 2021). Theoretically, it's not a replacement of the traditional theories but rather its further development and integration into the technologically overlaid environment.

The theory of Marketing 5.0 is derived from diverse theories and concepts like, Relationship Marketing theory, Consumer Engagement theory and Value creation with technology. Based on the theory of Relationship marketing, the critical factors to maintain long term relationship with consumers are interactions, trust and commitment (Morgan & Hunt, 1994). The extension of this concept is with consumer engagement theory in which it is conceptualized that engagement is the combination of three elements: cognitive, emotional and behavioural, and that this engagement can be varied through time (Hollebeek, Glynn, & Brodie, 2014). Marketing 5.0 takes these relational views and adds artificial intelligence-powered features, allowing companies to scale personalization and engagement and maintain human relevance.

3.2 Artificial Intelligence Applications and Sustainable Consumer Engagement (Revised)

The theoretical bases of applications of AI in marketing are of two types: the technology acceptance perspective and information processing theory, both of which are founded on consumer evaluation, adoption and interaction with intelligent systems. With the help of advanced AI technologies, businesses can process vast amounts of data, anticipate customer needs, and provide personalized interactions in real time, making their marketing efforts more relevant and effective (Wang et al., 2022).

AI marketing has been recently found to impact consumers' engagement in two ways: perceived intelligence, responsiveness, and usefulness of digital interfaces (Shankar, 2020; Luo et al., 2019). The use of AI applications in a consumer context is not always simple, however – it depends on variables such as transparency, perceived control and trust in algorithmic decision making. AI applications are beneficial in these countries, where there is less digital literacy and trust in institutions, and are used ethically, which facilitates engagement.

Therefore, AI solutions are expected to have an important influence on sustainable consumer interaction, especially in combination with mechanisms that build trust and values that are human oriented.

H1: Artificial intelligence applications have a positive effect on sustainable consumer engagement.

3.3 Human-Centered Strategies and Sustainable Consumer Engagement (Revised)

The approaches are human-centred and based on the theories of relationship marketing, service-dominant logic, and consumer engagement theory. This angle of view also sees customer experience, personalization, transparency and ethical values as relational tools that further reinforce emotional attachment and behavioral commitment (Verleye, 2020; Lemon & Verhoef, 2021).

But, in the digital world where human-to-human interaction is being replaced by digitally-mediated interaction interfaces, recent research highlights the need for human-centred approaches. Relational cues and ethical signals do this to make up for the reduced human contact and improve consumers' perception of fairness and legitimacy in such contexts (Homburg et al., 2017; Martín et al., 2023). All of these are key and will help to retain users in the long term, but not for a one-off interaction.

Therefore, the human-centred approach is expected to be influential and positive for sustainable consumer involvement, especially in markets with relational norms and a high moral sensitivity.

H2: Human-centered strategies have a positive effect on sustainable consumer engagement.

3.4 Digital Trust as a Mediating Mechanism

Digital trust is a critical factor in technology mediated marketing environments and is based on theory of trust theory and social exchange theory. Trust is based on consumers' positive expectations of competence, integrity, and benevolence (Gefen et al., 2003; Kim & Park, 2019).

Within the realm of AI-powered marketing, trust becomes even more pertinent as a result of worries about data privacy, algorithmic transparency, and a sense of control.

Research evidence in recent years reveals that the use of AI can increase consumer engagement in a sustainable way as long as consumers trust the digital platform that the technology is applied on and they perceive AI-driven interactions as fair and beneficial (Shankar 2020). Digital trust is an important intermediary mechanism that connects technology practice with the long-term engagement means and outcomes.

H3: Digital trust mediates the relationship between artificial intelligence applications and sustainable consumer engagement.

3.5 Ethical Sustainability as a Moderating Condition

Theoretical support is found in the stakeholder theory and the ethical marketing theory on the issue of ethical sustainability. Stakeholder theory states that in order to be sustainable, organisations should take into account the interests and well-being of all stakeholders, such as consumers and society (Freeman, 1984). Ethical marketing theory also states that ethical behaviour will help to build more legitimacy, credibility and relational trust.

From a Marketing 5.0 perspective, ethical sustainability enhances the impact of human-centred approaches by promoting moral alignment, fostering fairness, and building trust. As consumers feel that marketing practices are ethical and socially responsible, the impact of customer experience, personalisation and transparency on engagement is enhanced. However, these relationships may be undermined by moral issues even in the presence of relational strategies.

H4: Ethical sustainability moderates the relationship between human-centered strategies and sustainable consumer engagement, such that the relationship is stronger at higher levels of ethical sustainability.

3.6 Integrative Perspective of Marketing 5.0

AI applications and human-centric strategies are not mutually exclusive; they complement each other, as per the integrative logic of Marketing 5.0. Effective marketing results are found when the socio-technical systems are aligned, based on the socio-technical systems theory. An efficiency that relies on AI and is not legitimate from a human perspective can cause resistance to change; a relational approach that is not backed by technology can make it hard to scale and be outdated.

Thus, it is hypothesized that the synergy of the integration of artificial intelligence applications and human-centered approaches would yield better engagement results than either dimension would by itself.**H5:** The integration of artificial intelligence applications and human-centered strategies has a positive effect on sustainable consumer engagement.

4. Conceptual Model and Research Hypotheses

Based on the theories outlined in the previous section and the hypotheses presented, this study suggests an integrative conceptual model that would explain sustainable consumer engagement by the interaction of artificial intelligence applications and human centered approaches. The model is created to reproduce the main concept of Marketing 5.0, in which the focus is on the importance of technological intelligence and human values as a prerequisite to value creation in a sustainable way.

The proposed model considers two exogenous constructs as the core of the artificial intelligence applications and human-centered strategies. The technological aspect of Marketing 5.0 involves the use of artificial intelligence applications, such as data-driven personalization, automation, and predictive capabilities. Human-centered strategies are a relational and ethical approach that centres on customer experience, trust, transparency and value alignment. The two constructs are hypothesized to have direct impacts on the endogenous outcome variable, sustainable consumer engagement.

The model includes digital trust as a mediating variable and ethical sustainability as a moderating variable to capture the underlying mechanisms and the boundary conditions of these relationships. Consumers' trust in digital platforms and digital interactions with technology is seen as an important avenue for how AI applications can impact engagement in a sustainable way. In turn, ethical sustainability is added as a moderating condition that boosts the efficacy of human-centred strategies by improving the perceived legitimacy, fairness and moral congruence.

Moreover, the model is reflective of the integrative logic of Marketing 5.0 by capturing the synergistic effect of AI applications and human-centric strategies on sustainable consumers engagement. This integrative effect is based on the assumption that technological efficiency and legitimacy, which is human-centred, will together generate better engagement results than stand-alone strategies.

Accordingly, the conceptual model specifies five hypothesized relationships:
(1) a direct effect of artificial intelligence applications on sustainable consumer engagement (H1);
(2) a direct effect of human-centered strategies on sustainable consumer engagement (H2);
(3) a mediating effect of digital trust in the relationship between artificial intelligence applications and sustainable consumer engagement (H3);
(4) a moderating effect of ethical sustainability on the relationship between human-centered strategies and sustainable consumer engagement (H4); and
(5) an integrative effect of artificial intelligence applications and human-centered strategies on sustainable consumer engagement (H5).

The conceptual research framework is presented in this figure, which shows the direct effect that the applications of artificial intelligence and human-centered strategies have on sustainable consumer engagement, the mediating role of digital trust, and the moderating role of ethical sustainability, as well as the integrative logic of Marketing 5.0..

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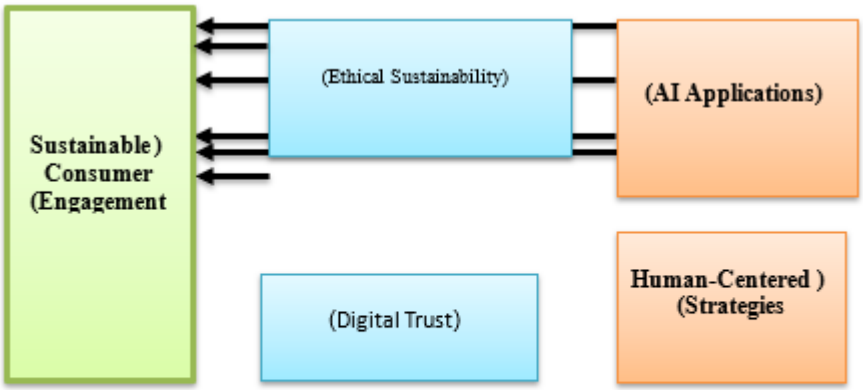

Figure 1 presents the proposed conceptual research model, illustrating the hypothesized direct, mediating, moderating, and integrative relationships among the study variables.

5. Research Methodology

(Reconstructed and aligned with empirical results – Scopus Q1/Q2)
Can this study be replicated and trusted?

5.1 Research Design

The research design used in this study is a quantitative research with explanatory approach, which aims to analyze the causal relationships between artificial intelligence applications, human-centered approaches, and sustainable consumer engagement in the marketing 5.0 approach. The objective of the study being to test the direct, mediating, moderating and integrative effects of the latent constructs is well supported by the explanatory design. The cross-sectional survey method was used to collect consumers' perceptions of AI-driven and human-centred marketing practices in the Iraqi market.

5.2 Population and Sample

The target population is the consumers who have a relationship with organizations that use digital marketing approaches with the help of technologies of artificial intelligence in Iraq. The Iraqi digital market is still in its infancy and does not have a comprehensive sampling frame, so a stratified random sampling technique was used to give representation according to several important demographic characteristics such as gender, age, education level and income.

400 questionnaires were retrieved and found suitable for statistical analysis. The sample size is larger than the minimum requirement for multivariate analysis and structural equation modeling, providing enough statistical power and robustness of the results.

5.3 Measurement Instruments

The data was gathered through a structured questionnaire with closed-ended questions similar to those used in existing research in the fields of marketing and information systems. The constructs measured in the questionnaire were:

- Artificial Intelligence Applications
- Human-Centered Strategies
- Digital Trust
- Ethical Sustainability
- Sustainable Consumer Engagement

A 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used for all items. Wording of the items was slightly restructured to make it more meaningful in context but not change the conceptual meaning of the items.

Assess the reliability and validity of the instrument.

Reliability and validity of measurement model were conducted before hypothesis testing to ensure the rigor of measurement model. Internal consistency was tested using Cronbach's alpha and composite reliability (CR), and convergent validity was tested using average variance extracted (AVE). The Fornell-Larcker criterion was used to test the discriminant validity. The values for all constructs were at or above the recommended values, which indicates that the measurement model is adequate.

5.5 Data Analysis Techniques

The data analysis technique employed was descriptive, preliminary analysis with SPSS, and testing the structural model with AMOS / SmartPLS. The analysis was carried out in three steps:

2. Frequency tables to provide summary information about variables
3. Descriptive statistics and bivariate relations to analyze the data

Estimating the hypothesized relationships and testing them in a structural model (direct, mediating and moderating effects)

Bootstrapping procedures were utilized to examine mediation effects, and interaction terms were used to examine moderation effects.

5.6 Ethical Considerations

Standard practices in research related to the social sciences were carefully adhered to. The participation in the study was voluntary, anonymity and confidentiality were maintained and the data collected were used only for academic purposes.

6. Results

6.1 Descriptive Statistics

Table 1. Demographic Profile of Respondents (N = 400)

Variable	Category	Frequency	Percentage (%)
Gender	Male	218	54.5
	Female	182	45.5
Age	Less than 25	96	24.0
	25–34	154	38.5
	35–44	102	25.5
	45 and above	48	12.0

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Variable	Category	Frequency	Percentage (%)
Education	Diploma or less	84	21.0
	Bachelor's degree	212	53.0
	Postgraduate	104	26.0
Monthly Income	Low	138	34.5
	Medium	176	44.0
	High	86	21.5

Table 1 shows that the sample consists mainly of economically active and digitally active groups of consumers, including those aged 25 to 44 and at least a bachelor's degree. This demographic composition is suitable for studying perceptions of AI-driven and human-centred marketing practices in the Iraqi market and will therefore contribute to the validity of the sample for the subsequent multivariate analysis.

6.2 Descriptive Statistics of Study Variables

Table 2. Descriptive Statistics of Study Variables

Construct	Mean	Standard Deviation
Artificial Intelligence Applications	2.87	0.64
Human-Centered Strategies	3.01	0.59
Digital Trust	2.94	0.61
Ethical Sustainability	3.08	0.57
Sustainable Consumer Engagement	2.84	0.66

Table 2 shows moderate perceived levels for applications of AI and sustainable consumer engagement. Human centered strategies and ethical sustainability show relatively high mean values, on the other hand. The pattern indicates that the Iraqi market consumers are more sensitive to the relational and ethical aspects than the technological applications of advanced technologies, which implies the initial stage of digital transformation, and a difference in the level of technology familiarity among consumers in the markets.

6.3 Measurement Model Assessment

Table 3. Reliability and Convergent Validity

Construct	Cronbach's Alpha	Composite Reliability (CR)	AVE
Artificial Intelligence Applications	0.88	0.90	0.61
Human-Centered Strategies	0.91	0.93	0.67
Digital Trust	0.86	0.88	0.60
Ethical Sustainability	0.89	0.91	0.65
Sustainable Consumer Engagement	0.92	0.94	0.69

As presented in the Table 3, the Cronbach's alpha and CR values of all constructs are higher than the recommended 0.70, which indicates that they have good internal consistency. Moreover, AVE values are above the minimum criterion of 0.50, thus indicating satisfactory convergent validity for all measures.

Table 4. Discriminant Validity (Fornell–Larcker Criterion)

Construct	AIA	HCS	DT	ES	SCE
AIA	**0.78**				
HCS	0.42	**0.82**			
DT	0.46	0.51	**0.77**		
ES	0.39	0.54	0.48	**0.81**	
SCE	0.44	0.58	0.52	0.55	**0.83**

Table 4 supports discriminant validity, because the square root of AVE (diagonal values) are higher than inter-construct correlation values. The results show that all constructs are empirically different and can be used for structural model analysis..

6.4 Structural Model Results and Hypotheses Testing

Table 5. Structural Model Results and Hypotheses Testing

Hypothesis	Path	β	t-value	p-value	Result
H1	AIA → SCE	0.31	5.82	<0.001	Supported
H2	HCS → SCE	0.48	8.67	<0.001	Supported
H5	AIA + HCS → SCE	0.52	9.14	<0.001	Supported

The results of Table 5 shows that the use of artificial intelligence applications has a significant and positive effect on the sustainable consumer engagement supporting the H1. Human centred strategies show more effect supporting H2. Furthermore, the combined impact of AI applications and people-centered methods is strongest, supporting H5, and empirically validating the core tenet of Marketing 5.0.

6.5 Mediation and Moderation Analysis

Table 6. Mediation Analysis of Digital Trust

Indirect Effect	β	Bootstrapped Confidence Interval	Mediation Type

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Indirect Effect	β	Bootstrapped Confidence Interval	Mediation Type
AIA → DT → SCE	0.19	[0.11, 0.27]	Partial Mediation

The findings reveal that digital trust plays a partial mediation role between the use of AI applications in the buying process and the sustainable involvement of consumers. The discovery suggests that AI applications impact engagement outcomes in two ways – directly and indirectly via trust-building mechanisms.

Table 7. Moderation Effect of Ethical Sustainability

Interaction Term	β	t-value	p-value	Result
HCS × Ethical Sustainability → SCE	0.21	4.36	<0.001	Supported

Table 7 reveals that the ethical sustainability significantly moderates the relationship between human-centered strategies and sustainable consumer engagement. Ethical sustainability, if increasingly integrated with this, makes the relationship even more solid, underscoring the significance of ethical alignment as a means to the highest effectiveness in human-centred marketing practices.

7. Discussion

The purpose of this study was to examine the impact of the integration of artificial intelligence application and human-centric strategies on sustainable engagement of consumers in the marketing 5.0 paradigm in an emerging market environment. Findings are reported in terms of the hypotheses and theory.

7.1 Artificial Intelligence Applications and Sustainable Consumer Engagement

The empirical findings suggest that there is a statistically significant positive influence between the use of AI applications and sustainable consumer engagement, in favor of Hypothesis H1. This outcome is consistent with previous studies that have pointed to the many possibilities of AI to enhance personalization, responsiveness and decision-making in marketing contexts. (Huang & Rust, 2021; Wang et al., 2022). This impact is still relatively small, however, indicating that the impact of AI-powered marketing will depend on the context of the digital maturity and consumer's awareness of cutting-edge technologies.

In developing nations like Iraq, the consumer almost might only see AI-related applications as a functional tool, but not a relator, which hinders their ability to nurture the relationship on their own merits. This interpretation is consistent with the technology acceptance theories which suggest that the perceived usefulness is a necessary but not sufficient condition to achieve a long-term behavioral commitment, unless there is a degree of trust and value match (Venkatesh et al., 2021).

7.2 Human-Centered Strategies as a key enabler to engagement

The results corroborate Hypothesis H2, which states that human-centred strategies have a more pronounced and persistent impact on sustainable consumer engagement than do AI applications. This finding supports the perspective of relationship marketing theory and consumer engagement theory (Morgan & Hunt, 1994; Hollebeek et al., 2014) in that the building of trust, experience, and emotional connection are the key components of longer-term consumer–firm relationships.

The importance of human centred strategies is due to the socio-cultural nature of the Iraqi market, where relational norms, transparency and ethical concerns have an important role in influencing consumer perceptions. The results show that, even in technologically mediated context, values of humans are still key to developing sustained engagement.

7.3 Mediating role of digital trust

In relation to the hypothesis H3, the mediation analysis indicates that the influence of the use of artificial intelligence applications on sustainable consumer engagement is partially mediated by digital trust.In the context of the hypothesis H3, the mediation analysis provides support for the hypothesis, that is, the influence of artificial intelligence applications on sustainable consumer engagement is mediated by digital trust in part. This is theoretically supported by the trust theory and social exchange theory that posits that trust is essential for continued interaction in an uncertain environment (Gefen et al., 2003; McKnight et al., 2011).

The findings show that the benefits of artificial intelligence applications to engagement outcomes are not only functional but also have a positive impact on the consumer's trust in digital platforms indirectly. Digital trust serves as an important mechanism that can help AI-powered marketing practices become sustainable in emerging markets, where data privacy and transparency are of particular concern.

7.4 Ethical sustainability in a moderating role

The moderation results provide support for Hypothesis H4 as ethical sustainability has a significant influence on the relationship between human-centered strategies and sustainable consumer engagement. This result is consistent with stakeholder theory and ethical marketing literature that state that ethical behaviour is beneficial for the organizations' legitimacy and relational stability (Freeman, 1984; Martín et al., 2023).

As consumers feel marketing practices are ethical and socially responsible, the benefits of customer experience, personalization and transparency are heightened. On the other hand, unethical sustainability can negatively impact the efficacy of even well-thought-out human-centred approaches, especially in institutional uncertainty.

7.5 Integrative Effect of Marketing 5.0

In this study, the integrative effect of the artificial intelligence applications and human-centered strategies with sustainable consumer engagement is the most supported by empirical evidence, which is aligned with Hypothesis H5. This outcome validates the core concept of Marketing 5.0, with a focus on the synergistic integration of technological intelligence and a human-centered approach (Kotler et al., 2021).

The results show that AI is not enough – and neither is human-centric approach – to keep consumers engaged. Better results come from technological capacity that is integrated within a system of trust, ethics and relationships, however. Through this integrative perspective, the theory of Marketing 5.0 is empirically supported, as it is determined that sustainable engagement is a socio-technical result, which is influenced by the interplay between technology and human values.

7.6 Contextual implications for emerging markets

As summarized, the findings shed light on the importance of the context of the Marketing 5.0 strategies in emerging markets. The relatively less effects of the AI applications than human-centric strategies indicate that there are structural and cultural aspects of the Iraqi market that need to be taken into account, including differences in digital trust and technoliteracy. The above learning suggests that for any organization in a similar context, implementing technology into a sequential process followed by establishing trust and alignment to an ethical process should be considered..

8. Implications

8.1 Theoretical Implications

The research offers some interesting theoretical contribution to the field of Marketing 5.0, Consumer engagement, and AI-based Marketing. First, the study contributes to the theory of Marketing 5.0, providing solid empirical support that do not sustainable consumer engagement can be achieved from artificial intelligence applications or human-centered strategies per se, but only through their synergistic and integrated association. While theoretical models of technology and values integration exist, empirical studies of the combination of technology and values, particularly in the emerging markets, are limited. This study reinforces the theoretical underpinnings of the integrated model as a more holistic and context-sensitive approach to marketing and the value of its explanatory power, through an

ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo

empirical confirmation.
Second, the findings extend and support the consumer engagement theory as it suggests that the difference between short-term engagement outcomes and the construct of consumer engagement in the long term should be taken into consideration. The results indicate that trust and ethical issues and human centred approaches are more influential in sustaining engagement than technological sophistication. This is a new lesson in the engagement models that are available, and a reminder to include ethical and trust-based considerations in the study of engagement in the digital world.
Third, the study contributes to the trust-based theories in digital marketing by providing empirical support for the mediation of digital trust. Instead of viewing trust as an outlier variable or a result, the results put digital trust in the center as a key explanatory variable that connects AI-powered marketing strategies to long-term engagement results. This paper connects the field of technology acceptance with the theories of relationship marketing and gives a fuller understanding of the impact of AI on consumers' behaviors.
Fourth, the study empirically tested ethical sustainability as a moderator, thus expanding ethical marketing beyond a normative discussion. The results show that the ethical sustainability acts as a boundary condition that strengthens the action of human-centered strategies, thus embedding ethics as an internal and symbolic factor of the structural logic of marketing models.

8.2 Managerial Implications

From the managerial point of view, the findings suggest a number of implications that can be used by organizations aiming to launch Marketing 5.0 initiatives in emerging markets.
First off, managers need to understand that investing in AI technologies is not enough for sustainable consumer engagement. AI applications can have positive impacts on engagement, but they must be trusted and viewed as being conducted ethically. Hence, the implementation strategies need to be looked at in a more comprehensive basis that is technology-driven, but also takes into account relational and ethical aspects.
Second, the findings reveal that the human-centred approaches are the lead factor in sustainable engagement in the Iraqi market. Improving the customer experience, transparency, and trust-building mechanisms should be considered as key priorities before or alongside implementing advanced AI technologies. Digital trust is still a nascent phenomenon in emerging markets, and these strategies are essential to the adoption and retention of digital technology.
Third, as the data is mediated by the digital trust, transparency in data practices and responsible AI governances are emphasized. Managers need to be transparent about how to collect, process and use consumer information and make sure that the use of AI in personalization is seen as useful and not invasive by the consumer. The design and implementation of AI systems should be informed by trust-building practices, not occur after-the-fact.
Fourth, the moderating effect of ethical sustainability implies that the consideration of ethical sustainability is not just a compliance issue, but a strategic asset. Firms that use ethical and social considerations in marketing are more likely to reinforce the effectiveness of human-based marketing and gain competitive advantage. Managers need to integrate ethical standards, fairness principles and social responsibility initiatives into their Marketing 5.0 strategies, and make them a core part of the institution.
Lastly, the resulting integrative effect in this study argues for the need of a balanced strategic orientation. Companies that can effectively integrate technological advancements with human empathy and ethical considerations are better positioned to foster sustainable consumer engagement and secure long-term competitive success in digitally transforming markets.

8.3 Policy and Institutional Implications

The findings also provide insights into policy and regulatory actors in the new digital markets. Therefore, it is essential to have frameworks and guidelines for data protection, transparency, and responsible use of AI. Policy makers should develop and adopt a set of rules that recognize consumer rights and a responsible approach to innovation.
Moreover, efforts to promote digital literacy and consumer awareness can contribute to the successful implementation of AI-powered marketing strategies. Policymakers can help build sustainable digital market development by creating an institutional framework that promotes technological progress and ethical governance.

9. Limitations and Future Research

Although this study's theoretical and empirical contributions, there are a number of limitations that should be noted, and directions for future research can be found in those limitations.
First of all, this study is based on the cross sectional study design, which does not give the opportunity to observe the changes in consumer perceptions and engagement behaviors over time. The impact of AI applications and human-centric interventions on sustainable consumer engagement is dynamic and future research could benefit from the use of longitudinal designs to investigate how the effects of these interventions change as people's digital maturity and trust increases.
Secondly, the study is based on self-report measures, which could suffer from common method bias and social desirability effects. Addressing some of these concerns was aided by procedural remedies and the use of statistical tests, while future research could also incorporate objective behavioral data, such as digital logs of interaction or transaction history, to further support the rigor of the empirical results.
Third, the empirical context of this study is within the Iraqi market, which is informative of the dynamics in emerging markets but could limit the generalizability of the findings. Further studies are recommended to compare and contrast the proposed Marketing 5.0 construct across countries or cultures to verify if the proposed construct can be replicated in other institutional, cultural and technological settings.
Finally, this study includes some important dimensions of AI applications and human-centered strategies, but there are also many other psychological factors and AI technologies (such as generative AI, conversational agents, and immersive technologies) that could be explored in future research to further develop and test the model.
In conclusion, future research could explore other boundary conditions and mediating processes, including regulatory trust, perceived risk, and organizational transparency, to further elucidate the impact of ethical and institutional factors on the effectiveness of Marketing 5.0 strategies.

10. Conclusion

This study aimed to investigate the effect of the application of artificial intelligence tools and human-centered approaches on consumer sustainable engagement in the context of Marketing 5.0 in an emerging market environment. The study was based on relationship marketing theory, consumer engagement theory and trust-based perspectives to design and test an integrative model that included digital trust as a mediator and ethical sustainability as a moderator.
The empirical results reveal that the use of artificial intelligence applications and human-centric approaches play a vital part in sustainable consumer engagement. But it is apparent that the results are more consistent and powerful when it comes to the human-centred approaches, especially in markets such as emerging markets, where the level of digital maturity is uneven and consumer confidence is fragile. Additionally, digital trust acts as a pivotal link between the application of AI in marketing and enduring engagement results, and ethical sustainability further enhances the impact of human-driven approaches.
More significantly, the study validates the integrative logic of Marketing 5.0, demonstrating that a unified approach of technological intelligence and human-centric values has greater engagement results than separate approaches. The results highlight that consumer

engagement for sustainability cannot be obtained only by technologically enabling new solutions, but also by an integrated strategy based on trust, ethics and relational values.

This study also extends the concept of Marketing 5.0 research to the Iraqi market, and adds context-specific insights to the existing models to improve their external validity, and provides practical tips for organizations that operate in emerging digital economies. The study concludes that future marketing is not about 'tech' vs 'human' but about 'tech + human' for sustainable value creation for consumers & society.

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ISSN 2714-7444 (online), https://acopen.umsida.ac.id, published by Universitas Muhammadiyah Sidoarjo