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AI-Driven Digital Marketing Capabilities and Sustainable Business Performance: Mediating Role of Sustainability Orientation and Moderating Role of Firm Resources

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Abstract

This study aims to bridge the gap in existing literature by examining the effect of Artificial Intelligence (AI)-driven digital marketing capabilities on business performance. It uses sustainability orientation as a mediator and resources as a moderator to add new insights. This study is based on the Resource-Based View and Dynamic Capabilities Theory. This study argues that AI-driven capabilities are considered a strategic resource that enhances sustainability orientation, leading to better business performance. PLS-SEM analysis of the data was used to assess the study objectives. The results show that AI-driven digital marketing capabilities have a significant effect on sustainability orientation ($\beta = 0.575$, $p < 0.001$), and sustainability orientation has a significant effect on business performance ($\beta = 0.693$, $p < 0.001$). The findings show that sustainability orientation mediates the effect of AI-driven capabilities on business performance. It also supports that firm resources moderate the relationship between AI-driven capabilities and sustainability orientation with low intensity. This study will help entrepreneurs use AI for business growth. The study also contributes to the literature by showing that sustainability performance results are better under strategic alignment rather than only the adoption of AI-driven capabilities.

Keywords: Artificial Intelligence, Digital Marketing Capabilities, Sustainability Orientation, Business Performance, Firm Resources, PLS-SEM

Introduction

Artificial intelligence (AI) has moved from an experimental technology to a practical managerial tool. In marketing, AI now supports customer segmentation, recommendation systems, dynamic pricing, campaign automation, lead scoring, sentiment analysis and predictive analytics. These tools allow firms to process large volumes of customer data, respond faster to market signals and personalise interactions at scale (Huang & Rust, 2021; Dwivedi et al., 2021). As a result, digital marketing is increasingly shaped by algorithms, automation and real-time optimisation.

Despite this momentum, an unresolved issue remains at the centre of both research and practice. Do AI-driven digital marketing capabilities (AIDMC) create durable business value, or do they mainly improve short-term metrics such as click-through rates, conversion rates and campaign efficiency? Many organisations report strong early gains after adopting AI tools, yet long-

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term performance benefits are often uneven. Some firms scale rapidly, while others struggle to convert digital investments into sustained competitive advantage.

One explanation is that technology alone is insufficient. Performance depends on how firms organise, govern and align technological capabilities with broader strategic priorities. In recent years, sustainability has become one such priority. Firms face growing expectations from regulators, investors, customers and society to reduce waste, operate ethically, improve transparency and create long-term stakeholder value (George et al., 2021; Gupta et al., 2022). These expectations are reshaping managerial definitions of performance.

This study argues that sustainability orientation (SUSO) is a key mechanism through which AIDMC influences business performance (BUSP). AI can improve forecasting, reduce inefficient spending, support responsible targeting, optimise resource allocation and strengthen customer relationships. However, these benefits become more meaningful when embedded in a managerial orientation that values long-term resilience rather than short-term extraction.

The study also considers firm resources (FC) as a boundary condition. Even when firms recognise the value of AI, implementation quality varies according to available finance, infrastructure, managerial expertise and employee skills. Resource-rich firms may scale AI initiatives more effectively, whereas constrained firms may adopt tools without achieving strategic depth.

The article contributes in three ways. First, it extends the AI marketing literature beyond campaign outcomes to BUSP. Second, it identifies SUSO as a mediating pathway. Third, it shows that FC strengthen the conversion of AI capability into sustainability outcomes. These insights are relevant for scholars of digital transformation and for managers seeking practical returns from AI investments.

Literature Review and Hypotheses Development

Digital Marketing Capabilities by AI

AIDMC can be described as how a firm uses AI-based technologies, data systems and managerial routines to enhance marketing decisions and implementation. These functions are customer analytics, behaviour prediction, automated communication, recommendation engines, content optimisation and performance measurement (Chaffey & Ellis-Chadwick, 2022). Capabilities, in contrast to stand-alone tools, indicate organisational competence repeated.

Under the Resource-Based View (RBV), capabilities are valuable when they enhance efficiency or differentiation and hard to imitate when based on proprietary information, learning rituals and experience (Barney, 1991). Practically, companies that have better digital marketing tools tend to react more quickly to the market change, budgetary allocations and customer experiences more efficiently (Verhoef et al., 2021).

However, previous research often focuses on the tactical results like engagement or acquisition without much attention given to the strategic and long-term effects. This prompts the necessity to study the organisational mechanisms according to which AI capabilities bring more widespread performance benefits.

SUSO Orientation as Strategic Mechanism

SUSO is an indicator of how much a company incorporates environmental, social and ethical issues in strategic choices and in the day-to-day activities. It is not constrained to compliance. It is an indicator of a proactive approach to long-term value generation, responsible behaviour and trust towards stakeholders (Sharma et al., 2021).

SUSO can be enhanced using AI in a number of ways. Improved forecasting minimises wastage and excess. Targeting enhances effective promotion spending. Process frictions and intensity of resources could be minimised through automation. The analytics enhance the visibility in the customer and operational systems, thereby making decisions more informed. Legitimacy and trust can also be improved by means of transparent and fair customer engagement. In terms of dynamic capabilities, SUSO is an advanced response strategy whereby companies restructure technological assets into long-term value generation (Teece, 2018). Accordingly:

H1: The digital marketing capabilities of AI have a positive impact on SUSO.

BUSP and SUSO

Financial, market and operational performance outcomes that are considered to be part of BUSP are profitability, growth, customer retention, efficiency and competitive position. Although sustainability is considered a cost centre by some managers, an emerging body of evidence connects sustainability-focused strategies to greater reputation, customer loyalty, waste minimisation, reduction of risks and resilience (Eccles et al., 2020; Kraus et al., 2022). A firm that is sustainability-oriented is likely to be in line with internal processes and external change expectations of the stakeholders. This congruence can reinforce the efficiency and legitimacy, which are valuable pillars of performance. Therefore:

H2: SUSO has a positive impact on BUSP.

Mediating Quality of SUSO

The impact of AI capability on performance will probably not be automatic. Technology brings about potential, and managerial orientation decides whether a potential will become durable value. Companies that apply AI to achieve short-term aggressive optimisation only might get short-term benefits and hurt trust or make their strategies more vulnerable. In comparison, companies that incorporate AI into sustainability-focused decision-making are better positioned to transform technological efficiency into long-term consequences.

Therefore, SUSO will be likely to relay the impact of AI capabilities on BUSP.

H3: SUSO mediates the connection between AI-based digital marketing abilities and BUSP.

Moderating Effect of FC

The firm's resources are financial capital, technology infrastructure, management ability, employees with skills and support systems within the organisation. These resources affect the quality and the level of AI implementation. A well-endowed firm is able to invest in information systems, attract talent, educate employees and streamline governance procedures. A firm with limitations can use the same tools but can hardly implement them. This can be interpreted to imply that resources enhance the positive role of AI capabilities on SUSO.

H4: FC have a positive moderating effect between AIDMC and SUSO.

Theoretical Foundation

The article combines the RBV and the Dynamic Capabilities Theory. RBV describes the reasons why AI-based marketing capabilities can be strategic assets when they are valuable, hard to replicate and integrated into the organisation (Barney, 1991). Dynamic Capabilities Theory is a theory that describes how companies adjust and re-architect such assets when the environment is changing (Teece, 2018). SUSO in this context is thought of as a strategic reconfiguration process that directs AI capability to long-term value creation.

Conceptual Framework

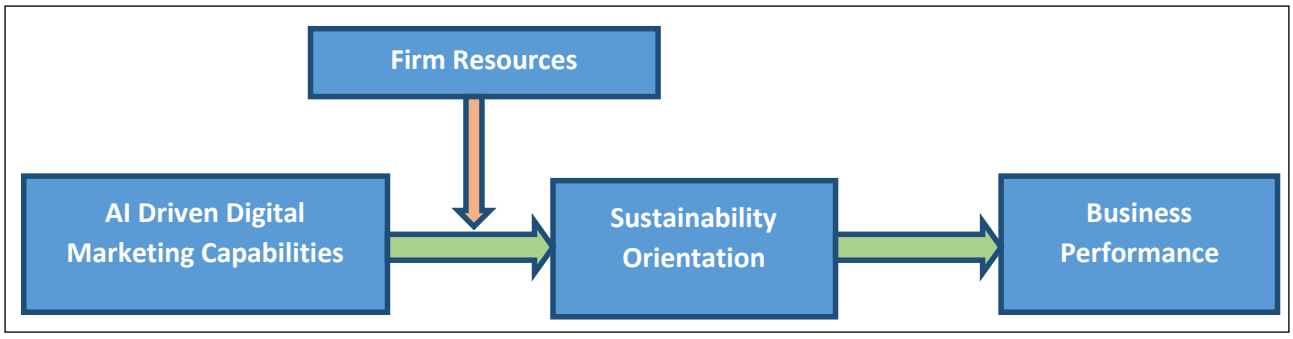

Fig. 1: Conceptual Framework

In the conceptual framework in Fig. 1, AIDMC has been used as independent SUSO as mediator and BUSP as dependent variable. FC have been used as moderator.

Research Methodology

Research Design

The research design used was a cross-sectional and explanatory quantitative design. The design is suitable when the theoretically defined relationships between latent constructs measured using survey indicators are to be tested.

Data Collection and Sample

The structured questionnaire was used to collect primary data and sent to the respondents who understood digital marketing and organisational decision-making. Screening responses that were not complete resulted in 223 usable questionnaires being retained to be analysed.

Measures

Multi-item scales based on previous literature and tailored to the study setting were used to measure all constructs. The answers were recorded on a seven-point Likert scale from strongly disagree to strongly agree.

Analytical Technique

It was done by Partial Least Squares Structural Equation Modelling (PLS-SEM) via SmartPLS. PLS-SEM is appropriate in prediction-based studies, latent variables, mediation, moderation and models, which do not presuppose strict multivariate normality (Hair et al., 2022).

Results

Measurement Model Assessment

The measurement model was evaluated in terms of indicator reliability, internal consistency reliability, convergent validity, discriminant validity and multicollinearity.

Table 1: Reliability and Convergent Validity

Construct	*Items*	*Loading Range*	*Alpha*	*CR*	*AVE*	*Decision*
AIDMC	4	0.766-0.881	0.867	0.909	0.714	Accepted
BUSP	3	0.811-0.880	0.800	0.883	0.715	Accepted
FR	3	0.882-0.938	0.899	0.936	0.830	Accepted
SUSO	3	0.806-0.878	0.808	0.886	0.722	Accepted

All factor loadings exceeded recommended levels. Cronbach's alpha and composite reliability values were above 0.70, indicating internal consistency. AVE values exceeded 0.50, confirming convergent validity.

Table 2: Discriminant Validity (Fornell-Larcker Criterion)

Construct	*AIDMC*	*BUSP*	*FR*	*SUSO*
AIDMC	0.845			
BUSP	0.377	0.846		
FR	0.183	0.426	0.911	
SUSO	0.602	0.693	0.354	0.850

The square root of AVE for each construct exceeded the corresponding inter-construct correlations, supporting discriminant validity in Table 2. All VIF values were below critical thresholds, indicating no serious multicollinearity concerns, having values less than 3.

Structural Model Assessment

Bootstrapping was used to test the significance of hypothesised paths.

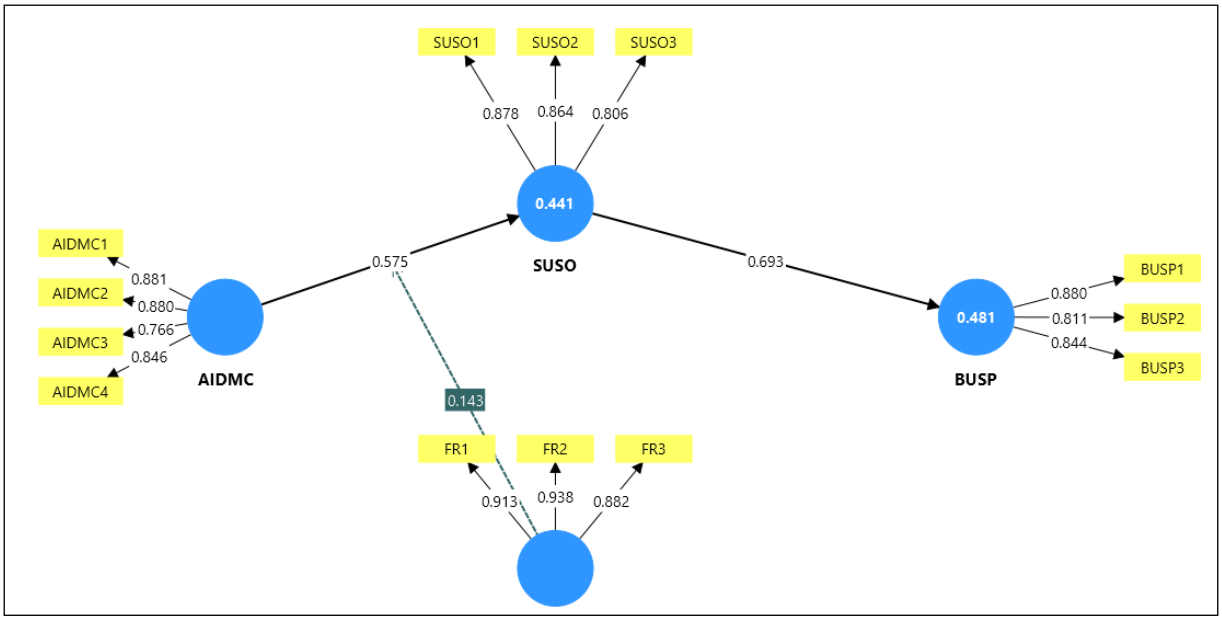

Fig. 2: SmartPLS Result Output

In Fig. 2, Bootstrapping results in SmartPLS showed that AIDMC had a significant positive effect on SUSO (β = 0.575, t = 11.765, p < .001), indicating that stronger AI capabilities improve firms' sustainability focus. SUSO significantly enhanced BUSP (β = 0.693, t = 19.449, p < .001), suggesting that sustainability-oriented firms achieve better overall outcomes. FC also positively influenced SUSO (β = 0.250, t = 5.017, p < .001). Further, the interaction effect was significant (β = 0.143, t = 2.639, p = .008), confirming that FC strengthen the impact of AI capabilities on SUSO.

Mediation Analysis

The indirect impact of AI-based digital marketing abilities on BUSP via SUSO was justified since the direction of AIDMC to SUSO and SUSO to BUSP were both positive and significant in Table 3. This implies that SUSO serves as the process by which AI capability is converted to performance benefits and H3 is supported.

Table 3: Specific Indirect Effects

Indirect Path	*Beta*	*T-Value*	*P-Value*	*Interpretation*
FR × AIDMC → SUSO → BUSP	0.099	2.642	0.008	Significant moderated mediation.
AIDMC → SUSO → BUSP	0.399	10.281	0.000	Strong mediation.
FR → SUSO → BUSP	0.174	4.690	0.000	Significant indirect effect.

The specific indirect effect of AIDMC on BUSP through SUSO was significant (β = 0.399, t = 10.281, p < .001), confirming the mediating role of SUSO.

Moderation Analysis

The positive and significant interaction term was between FC and AI capability. This implies that the greater the

resources, the higher the level of impact of AI capability in developing SUSO. Nonetheless, the effect size was minimal, which means that resources facilitate the implementation but do not dictate the results per se.

Table 4: Coefficient of Determination

Endogenous Construct	*R^2*	*Adjusted R^2*	*Interpretation*
SUSO	0.441	0.223	Mediate
BUSP	0.481	0.478	Moderate

Table 4 shows that the model explains meaningful variance in both endogenous constructs.

Table 5: Model Fit

Index	*Value*	*Threshold*	*Verdict*
SRMR	0.079	<0.08	Acceptable

Table 5 shows acceptance of the overall model having lower than the threshold limit.

Table 6: Hypothesis Testing Summary

Hypothesis	*Path*	*Beta*	*T-Value*	*P-Value*	*f^2*	*Verdict*
H1	AIDMC → SUSO	0.575	11.765	<.001	0.561	Supported
H2	SUSO → BUSP	0.693	19.449	<.001	0.926	Supported
H3	AIDMC → SUSO → BUSP (Indirect Effect)	0.399	10.281	< 0.000	--	Supported
H4	FR × AIDMC → SUSO	0.143	2.639	.008	0.031	Supported

Table 6 shows all hypotheses have been supported in the results.

Discussion

The results indicate that AIDMC generates more value upon being integrated within a sustainability-based strategy. This finding undermines a managerial perspective that regards AI as a strategic optimisation tool. AI enhances the quality and efficiency of decisions, and long-term sustainability seems to be determined by the manner in which such benefits are controlled and managed.

The model showed the highest relationships between SUSO and BUSP. This implies that a combination of operational efficiency with responsible and long-term concerns is beneficial to firms. These companies will tend to have greater trust, a reputation, reduced wastage and stable relationships with stakeholders.

The correlation between AI capability and SUSO is positive, which means that technology could facilitate responsible strategy, as opposed to being in conflict with it. AI and sustainability can be discussed as two different agendas in the public debate. The fact here indicates that they can become mutually reinforcing in case they are well managed.

The mediation result confirms that SUSO is the mechanism through which AI capabilities create business value. This means that simply possessing AI tools or data systems does not guarantee better performance. Firms must convert these capabilities into meaningful organisational practices. This has practical significance because many businesses invest heavily in AI technologies without redesigning strategy, culture or processes. Such firms may fail to realise expected returns.

Moderation outcome has a nuance as well. Resources are important, but with limited significance. Finance, infrastructure and skilled personnel enhance the quality of implementation, but resources alone are insufficient to ensure strategic success. Companies still require administrative clarity, organisational discipline and means of correspondence between technology and meaning.

Theoretical Implications

The research paper has a number of contributions to the literature. First, it transforms AI marketing research beyond short-term campaign metrics to the larger BUSP outcomes. Second, it determines SUSO as a mediating factor, which reveals how technological capability would be strategically productive. Third, it explains that FC

are enabling conditions and not automatic sources of advantage. Lastly, it shows the complementary nature of integrating RBV and Dynamic Capabilities Theory to explain the AI-enabled transformation.

Managerial Implications

Managers are not to consider AI initiatives by using short-term performance metrics like clicks, leads or cost-per-acquisition. These measures are important, yet they do not give the full picture. It is probably worth more when AI serves to facilitate effective resource utilisation, ethical targeting, open communication and long-term customer relations. Companies ought to invest in data quality, staff competency and governance systems that inform responsible AI implementation. Small companies with limited resources do not have to emulate the large-scale investments. Even concentrated and perfectly aligned AI applications may bring about valuable advantages.

Conclusion

The use of AI to create digital marketing capabilities does not necessarily lead to better BUSP. They are realised more when they are incorporated by the firms into their sustainability-based strategic practices. SUSO emerged as the strongest pathway linking AI capabilities with superior performance outcomes. The managerial question of interest is not thus whether firms implement AI, but whether they structure AI on long-term stakeholder value.

Limitation and Future Research

It is cross-sectional and hence does not allow strong causal inference. The self-reported measures of data collection can cause common method concerns. Longitudinal designs, multi-source data, sector comparisons and cross-country samples should be used in future research. There might be other mediators like trust, culture of innovation or governance ability that can be used to add more knowledge.

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