

Digital Marketing Capabilities and MSME Performance: Implications for Environmental Sustainability — Evidence from MSMEs in Uttarakhand, India

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Abstract

Digital technologies are revolutionizing business operations of Micro, Small and Medium Enterprises (MSMEs) in particular among the businesses with emerging economy settings that are characterized by infrastructural and resource limitations. This paper analyses the effects of digital marketing capabilities on the performance of MSMEs and its consequences on environmental sustainability using the evidence of MSMEs in Uttarakhand, India. Based on the Resource-Based View (RBV), and the Balanced Scorecard (BSC), the research uses the Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine the primary data of 293 MSMEs. The findings reveal that digital marketing capabilities significantly enhance MSME performance ($\beta = 0.765$, $p < 0.001$). MSME performance further drives environmental sustainability outcomes, including resource efficiency, waste reduction, and eco-friendly practices. The results confirm a mediation mechanism, indicating that digital marketing contributes to sustainability indirectly through performance improvements. This study points out that digital marketing is not only a performance-enhancing activity, but also a pathway to sustainable business practices. The results have significant implication to MSMEs and policy makers in the emerging economy regions.

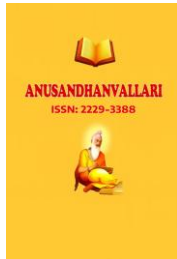
Keywords: Digital Marketing Capabilities, MSMEs, Environmental Sustainability, PLS-SEM, Resource Efficiency, Uttarakhand

1. Introduction

The Micro, Small and Medium Enterprises (MSMEs) are very vital to the economic development, especially in the developing economies. These businesses, however, are often limited structurally in terms of limited resources, poor infrastructure, and a lack of access to modern technologies. Here, digital marketing has become a cheap means of improving communication growth in terms of market coverage and competitiveness.

MSMEs in regions such as Uttarakhand, India, operate under conditions of infrastructural limitations and financial constraints, which influence both the adoption of digital marketing practices and the implementation of sustainability-oriented strategies. Prior studies indicate that MSMEs in such contexts rely on accessible digital tools to enhance performance and market responsiveness (Kumar et al., 2021; Kanellos et al., 2024).

Simultaneously, the sustainability of the environment has turned into a valuable business issue. Green marketing incorporates the element of environmental responsibility in organisational activities, which prove sustainable development (Katrandjiev, 2016; Choudhary and Gokarn, 2013). Businesses are gradually obligated to achieve a



compromise between economic output and environmental effect, especially by means of effective resource management and waste minimisation (Garg, 2015; Thakkar, 2021).

Digital marketing has sustainability advantages since it will reduce the use of physical methods like printed materials and traveling-based promotion, enhancing the efficiency of resources. However, although digital transformation and sustainability have become more popular topics, few studies have investigated the effects of digital marketing capabilities on the performance of MSME and the extent to which these performance outcomes lead to environmental sustainability through some unified empirical frameworks.

2. Literature Review

2.1 Digital Marketing Capabilities and MSME Performance

Digital marketing capabilities are the capacity of a firm to use digital tools, platforms, and data in improving marketing and business performance. These capabilities are especially significant in the case of MSMEs where there are limited finances and operational resources. According to previous empirical researches, digital marketing can increase the engagement of customers, brand visibility, and contribute to the increase in revenue (Kumar et al., 2021).

Resource-Based View (RBV) points out that digital marketing capabilities act as strategic resources that can help the firms to gain competitive advantage when developed effectively by the managers (Barney, 1991). The literature however emphasizes that to get benefits on performance are based on the degree of strategic use of digital marketing capabilities rather than only adoption. Most recent results also emphasize that digital marketing increases the value creation by creating better resource utilisation and efficiency (Kanellos et al., 2024).

2.2 Green Marketing and Environmental Sustainability

Green marketing has evolved to a wider understanding of sustainable marketing that incorporates business responsibility into the environment (Katrandjiev, 2016). It is aimed to minimize the effects on the environment and at the same time, economic performance.

Previous studies set green marketing as one of the central processes of achieving sustainable development (Mohajan, 2011; Choudhary and Gokarn, 2013). Practices based on sustainability enhance environmental performance and organisational performance (Thakkar, 2021; Garg, 2015). The customer-oriented study also suggests that green marketing has an impact on the buying behaviour and supports the sustainable consumption (Reddy et al., 2023; Mallick et al., 2024). Nonetheless, sustainability needs more than mere symbolic integration in its operations (Gingerich, 2015).

2.3 Digital Marketing and Sustainability Linkages

The recent literature indicates that digital transformation can help in promoting environmental sustainability. Digital marketing will also minimize the use of physical processes e.g. printed reporting and travel which will lead to an increase in resource efficiency and eliminate waste.

There is empirical evidence indicating that digital marketing practices affect the use of energy and the environment (Thangam & Chavadi, 2023). Environmentally friendly operations and communication are also enabled by the use of digital solutions (Alkhatib et al., 2023). Other than that, digital tools may also be incorporated into waste management and sustainable production systems, and may be used not solely in marketing (Imaningsih et al., 2024). The new technologies, including AI, also contribute to efficiency and minimization of resources waste in marketing undertakings (Ganesh et al., 2024).

2.4 Integration of Performance and Sustainability

In the growth of businesses, the correlation between digital marketing, performance and sustainability is not properly intact. Available literature has addressed that digital marketing enhances the performance of firms and sustainability activities can be used to improve environmental outcomes. Nevertheless, there is minimal literature that evaluates the interaction of these factors in an integrated basis.

MSMEs in the emerging economy like Uttarakhand, it becomes important to use resources efficiently and for achieving this environment-friendly business models can be enhanced using digital marketing, as it can enhance efficiency and minimize waste (Aqmala and Putra, 2023). Simultaneously, marketing practices that are eco-friendly affect consumer behaviour and the sustainability outcomes on the firm level (Reddy et al., 2023; Mallick et al., 2024).

2.5 Research Gap

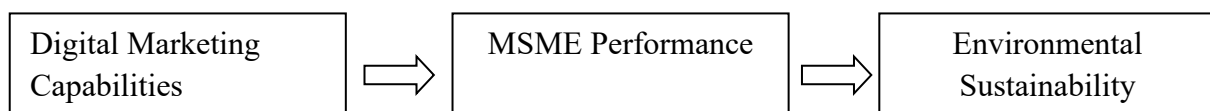
After considering previous literature, these key gaps are revealed:

- Limited empirical studies linking digital marketing, MSME performance, and sustainability
- Lack of integration between RBV and sustainability perspectives
- Insufficient focus on MSMEs in emerging economy regional contexts

This study addresses these gaps by examining the mediating role of MSME performance in linking digital marketing capabilities with environmental sustainability.

3. Conceptual Framework & Hypothesis Development

The study revolves around the theory of “Resource-Based View (RBV)” and the “Balanced Scorecard (BSC)”. The possibilities of digital marketing are imagined as organizational capabilities increasing the performance of the firm in terms of better customer interaction, access to the market and efficiency of the operations. MSME performance is placed as an mediating construct, which connects digital capabilities to environmental sustainability results. That is indicative of a capability-performance-outcome chain, through which performance improvement allows firms to better make use of resources and minimize waste and become environmentally responsible. Therefore, environmental sustainability is not viewed as a direct result of digital marketing but as an indirect result that is attained through an improved organizational performance.



3.1 Hypothesis Development

In the perspective of Resource-Based View, the digital marketing capabilities are the organizational assets that are valuable in promoting the performance of firms due to their ability to increase customer interaction, market responsiveness and utilization of resources (Barney, 1991). It is an empirical fact that a firm practicing digital marketing should gain better performance results because of the efficiency and reach (Kumar et al., 2021; Kanellos et al., 2024). To this end, it is anticipated that digital marketing abilities will positively influence the performance of the MSMEs.

Moreover, better performance of firms allows better allocation and utilization of resources, which results in less wastage and operational efficiency. According to the literature on green marketing, efficient use of resources and responsible business practices are closely related to the sustainability outcomes (Thakkar, 2021; Mohajan, 2011). Thus, the performance of MSMEs should have a positive effect on the sustainability of the environment.

On the basis of it, MSME performance is conceptualized as a mediating mechanism through which digital marketing capabilities influence sustainability outcomes.

- H1: Digital marketing capabilities positively influence MSME performance
- H2: MSME performance positively influences sustainability
- H3: MSME performance mediates the relationship

4. Methodology

4.1 Research Design

The research design used in the study is quantitative research design according to deductive approach to study the relationship between digital marketing abilities, the performance of MSMEs, and the environmental sustainability. A cross-sectional design was employed, as data were collected at a single point in time. This approach is appropriate for testing hypothesized relationships using structural equation modeling.

4.2 Data Collection and Sample

The structured questionnaire was used to collect primary data by use of a structured questionnaire to the owners and managers of the businesses in the MSME. In the case of 378 responses, the first gathering was made. A total of 293 valid responses were left to final analysis after data screening to be complete, consistent, and responses of quality.

The data cleaning process entailed deleting of incomplete responses, detection of straight-lining patterns and deleting of inconsistent entries. This made the dataset to be reliable and strong enough to be used in analysis process.

4.3 Measurement of Constructs

The measurement of digital marketing capabilities was based on the adapted items that were used in the previous research on digital tools utilization and online engagement behavior (Kumar et al., 2021; Kanellos et al., 2024). The performance of MSMEs was measured in terms of the indicators corresponding to Balanced Scorecard framework such as financial and non-financial aspects (Kaplan and Norton, 1996). Environmental sustainability was measured using constructs related to eco-friendly practices, resource efficiency, and waste reduction, adapted from green marketing and sustainability literature (Thakkar, 2021; Mallick et al., 2024; Reddy et al., 2023). All items were measured on a five-point Likert scale. All items were measured using a five-point Likert scale.

4.4 Pilot Study

A pilot study was conducted with 50 respondents to assess the reliability and clarity of the measurement instrument. The results indicated satisfactory internal consistency, with Cronbach's alpha values exceeding the acceptable threshold of 0.70 for all constructs, confirming scale reliability (Hair et al., 2019). Minor modifications were made to improve clarity and content validity.

4.5 Data Analysis Technique

The study employs Partial Least Squares Structural Equation Modelling (PLS-SEM) through SmartPLS (Ringle et al., 2024). PLS-SEM can be utilized because it is suitable when a complex construct-based model is required to be used in the analysis of predictions..

The analysis was conducted in two stages:

1. Measurement model evaluation (reliability and validity)
2. Structural model evaluation (hypothesis testing and mediation analysis)

5.1 Measurement Model Assessment

Table 1: Indicator Loadings, Reliability, and Convergent Validity

Construct	Item	Loading	Alpha	CR	AVE
DMC	DMC1	0.851	0.906	0.927	0.681
	DMC2	0.852			
	DMC3	0.719			
	DMC4	0.838			
	DMC5	0.816			
	DMC6	0.867			
MSMEP	MSMEP1	0.747	0.871	0.913	0.724
	MSMEP2	0.877			
	MSMEP3	0.896			
	MSMEP4	0.875			
ECOP	ECOP1	0.772	0.822	0.882	0.651
	ECOP2	0.838			
	ECOP3	0.809			
	ECOP4	0.808			
RESEF	RESEF1	0.804	0.777	0.870	0.691
	RESEF2	0.839			
	RESEF3	0.850			
WSTR	WSTR1	0.827	0.743	0.853	0.659
	WSTR2	0.828			
	WSTR3	0.781			

Table 1 shows that all loadings exceed 0.70, confirming indicator reliability. Cronbach's alpha and CR values are above 0.70, and AVE exceeds 0.50. These results establish strong internal consistency and convergent validity across all constructs.

5.2 Discriminant Validity

Table 2: Discriminant Validity

Construct	DMC	MSMEP	ECOP	RESEF	WSTR
DMC	0.825				
MSMEP	0.765	0.851			
ECOP	0.456	0.526	0.807		
RESEF	0.534	0.618	0.734	0.831	
WSTR	0.500	0.583	0.764	0.832	0.812

Table 2 shows Fornell-Larcker results confirm discriminant validity, with diagonal values exceeding inter-construct correlations. HTMT values below 0.90 further indicate that constructs are distinct and free from multicollinearity issues.

5.3 Structural Model Assessment

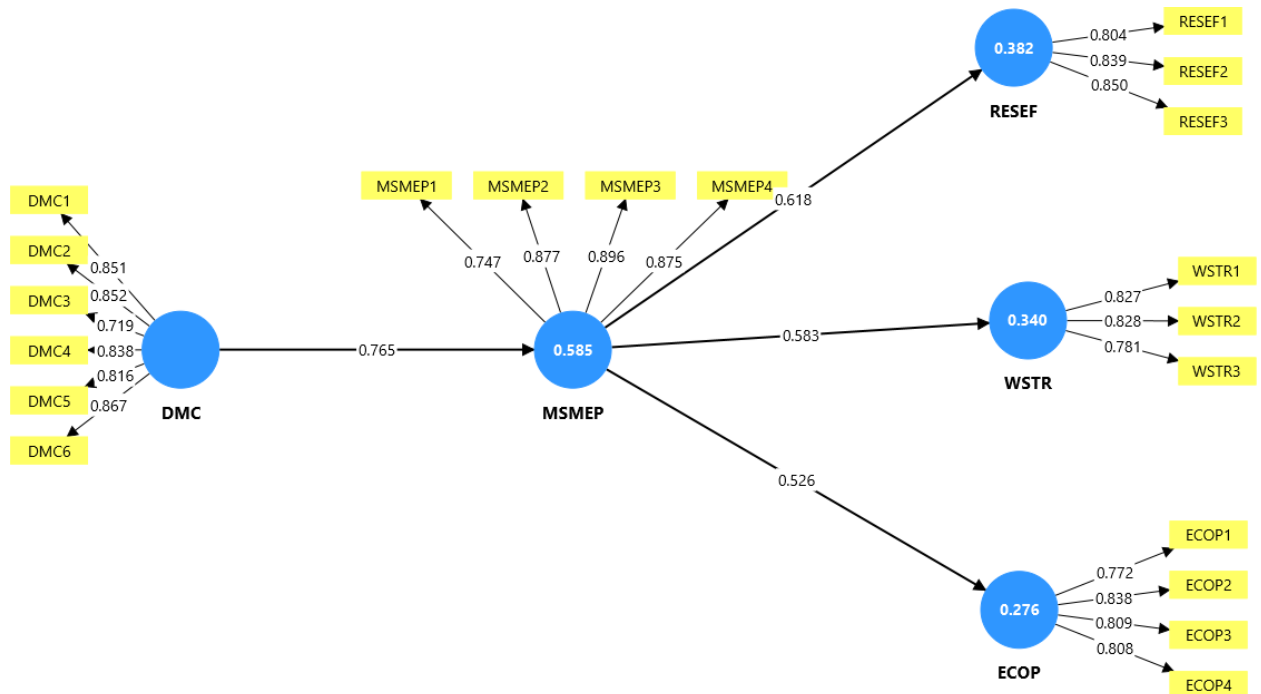


Figure 1. Structural Model Results (PLS-SEM)

Figure 1 presents the structural model results, illustrating the relationships between digital marketing capabilities, MSME performance, and environmental sustainability constructs.

Table 3: Path Coefficients, R², and Effect Size

Path	Beta	T-value	P-value	f ²
DMC → MSMEP	0.765	26.764	0.000	1.410
MSMEP → ECOP	0.526	11.003	0.000	0.382
MSMEP → RESEF	0.618	16.752	0.000	0.618
MSMEP → WSTR	0.583	14.670	0.000	0.515

Table 3.1: R² Values

Construct	R ²
MSMEP	0.585
ECOP	0.276
RESEF	0.382
WSTR	0.340

Table 3 shows that digital marketing significantly influences MSME performance with a large effect size. MSME performance positively affects all sustainability dimensions. Table 3.1 shows that R² values indicate moderate explanatory power, and SRMR = 0.069, that confirms good model fit. All hypothesized relationships are statistically supported.

5.4 Mediation Analysis

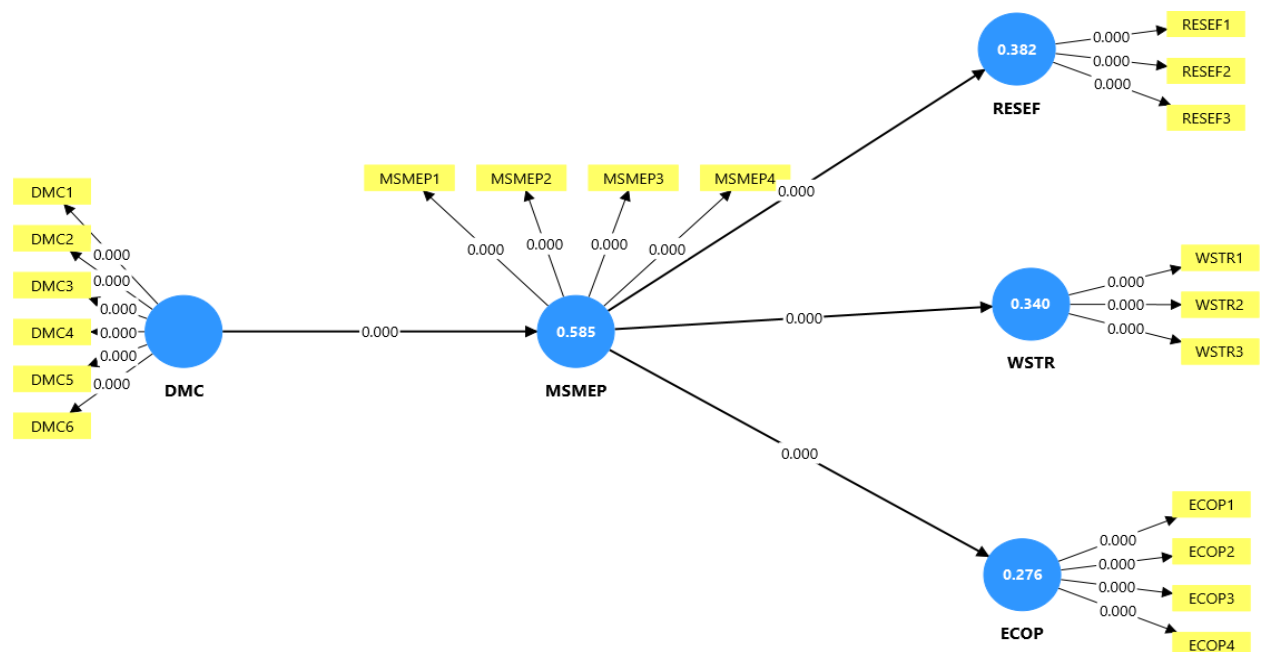


Figure 2. Bootstrapping Results for Structural Model

Figure 2 presents the bootstrapping results, confirming the statistical significance of the hypothesized direct and indirect relationships

Bootstrapping analysis in PLS-SEM was done to mediate the analysis. The findings show that the indirect impact of the digital marketing capabilities on the environmental sustainability via the performance of the MSMEs is positive and statistically significant ($p < 0.001$). This upholds the fact that MSME performance acts as a mediator of the correlation between digital marketing capabilities and sustainability outcomes. When a mediator is added, the direct impact of digital marketing on sustainability turns out to be of little importance, which means complete mediation. These results indicate that digital marketing has an indirect effect on the sustainability of the environment, as it influences the performance of the firm.

6. Discussion

The results are relevant in the framework of MSMEs in Uttarakhand, India, where business is conditioned by infrastructural constraints and lack of resources. On this front, digital marketing is an affordable tool that does not only improve the performance of the firm, but also promotes efficient resource use and minimisation of wastage. It points to the duality of the role of digital capabilities in enhancing competitiveness and facilitating sustainability in emerging economy MSMEs (Garg, 2015; Aqmal and Putra, 2023).

The findings substantiate that digital marketing capabilities can make a big difference in the performance of MSMEs ($b = 0.765$) making digital marketing to be one of the fundamental organisational capabilities. In terms of the Resource-Based View (RBV), it implies that the successful use of digital tools by the firms can enhance the overall experience with the customers, increase the market coverage, and use the resources more productively (Barney, 1991). The great effect size also indicates that performance improvement is not a matter of adoption but this is based on the development of the capability.

The results also indicate that performance of MSMEs is a major factor determining environmental sustainability in terms of resource efficiency, waste reduction, and sustainable environmentally practices. The most significant impact is on resource efficiency ($b = 0.618$), which implies that more effective firms are more efficient in using resources, which is in line with the concept of sustainable marketing (Thakkar, 2021; Mohajan, 2011). Equally, good performance minimizes inefficiencies and operational waste which substantiate the relationship between performance and sustainability.

The findings also prove that digital marketing has an indirect effect on sustainability because of the increased performance. Digital tools decrease the need to use the physical channel through printed materials and traveling, and enhanced targeting decreases redundant marketing efforts (Thangam and Chavadi, 2023). The mediation effect proves that the digital capabilities affect sustainability via the performance and expands the RBV by proving that the capabilities should be converted to performance and then produce broader results. This is also align with the Balanced Scorecard model, in which enhancement of internal processes and learning facilitates the long-term organisational results (Kaplan and Norton, 1996).

Overall, digital marketing functions as both a performance driver and a sustainability enabler in MSMEs, although its effectiveness depends on the extent of capability development.

7. Limitations

The study adopts a cross-sectional design and relies on self-reported data, which may introduce response bias. The sample used is restricted to MSMEs in Uttarakhand, India and this limits generalisability. The

environmental sustainability is assessed based on the perceptual but not objective measures. Moreover, the research fails to include sophisticated digital solutions like AI or analytics, which can affect the sustainability results.

8. Future Research

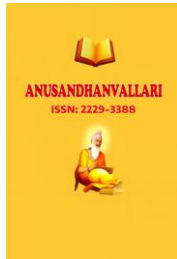
In future research longitudinal designs should be used to investigate causal relationships associated with digital marketing, performance, and sustainability. They should include objective sustainability measures like energy use and emission and therefore should be included in studies. It would be more generalised through comparative analysis within regions and industries. The importance of the use of advanced technologies, such as AI and data analytics, to enhance digital capabilities and sustainability outcomes within MSMEs should also be researched further.

9. Conclusion

The study identifies that the digital marketing capabilities impact the MSME performance in a significant way and indirectly impact the environmental sustainability due to the increased efficiency and decreased resource consumption. One of the mechanisms that connect digital capabilities and the sustainability outcomes is the performance of MSME. Digital marketing as a strategic direction in the context of MSMEs in Uttarakhand, India, is a way of realizing economic performance and environmentally accountable business operations. Enhancing the digital capacities is consequently a necessity to make the emerging economy MSMEs grow sustainably.

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