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Article

Digital Marketing Capabilities and Innovation Performance in E-commerce Platforms: Evidence from European SMEs

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Abstract: This study investigates the relationship between digital marketing capabilities and innovation performance among small and medium-sized e-commerce platforms operating in competitive European markets. As digital transformation reshapes business landscapes, understanding how marketing digitalization drives innovation becomes crucial for platform sustainability. The research employs a resource-based view framework to examine 238 e-commerce platforms across Germany, France, and the Netherlands, utilizing a structured survey instrument measuring digital marketing sophistication, innovation outputs, and organizational characteristics. Data collection occurred between January 2023 and March 2024, targeting platforms with 50-500 employees and annual revenues between €1-50 million. Structural equation modeling reveals that advanced digital marketing capabilities significantly enhance innovation success rates by 41%, with data analytics competency demonstrating the strongest direct effect ($\beta=0.52$, $p<0.001$). Customer engagement metrics, measured through interaction frequency and user-generated content volume, mediate 35% of the marketing-innovation relationship. The analysis identifies three digital marketing capability clusters—analytical, engagement-oriented, and automation-focused—each contributing differentially to innovation outcomes. Platforms investing over 15% of revenue in digital marketing technologies show 2.4 times higher product innovation rates and 58% faster feature development cycles. Control variables including platform age, market competition intensity, and prior innovation experience explain additional variance.

These findings extend digital innovation theory by establishing marketing capabilities as critical innovation antecedents and provide practical guidance for resource allocation decisions in resource-constrained SME platforms.

Keywords: digital marketing; e-commerce platforms; lnnovation performance; european SMEs; digital capabilities

1. Introduction

The digital transformation has fundamentally reshaped business landscapes, compelling e-commerce platforms to continuously innovate to maintain competitive advantage in increasingly dynamic markets. Small and medium-sized enterprises (SMEs) operating e-commerce platforms face particularly acute challenges in navigating this transformation, as they must balance resource constraints with the imperative to develop sophisticated digital capabilities (Homburg and Wielgos, 2022). The emergence of digital marketing capabilities as a critical driver of innovation performance has garnered significant attention, yet the mechanisms through which these capabilities translate into tangible innovation outcomes remain insufficiently understood (Jung and Shegai, 2023).

Digital marketing capabilities represent complex bundles of skills and knowledge embedded in organizational processes that enable firms to leverage digital technologies for customer engagement and value creation (Ahmed et al., 2022). While previous research has established the positive relationship between digital capabilities and firm performance, the specific pathways through which digital marketing capabilities influence innovation in e-commerce platforms require deeper investigation. The resource-based view (RBV) provides a theoretical lens for understanding how these capabilities, as valuable and imperfectly imitable resources, contribute to sustainable competitive advantage. Recent empirical evidence from European markets demonstrates that innovation-driven approaches significantly enhance e-commerce growth trajectories (Roszko-Wójtowicz et al., 2024), yet the underlying capability configurations that enable such innovation remain underexplored.

The integration of ICT adoption and digital marketing capabilities has been shown to impact SME performance through multiple pathways (León-Gómez et al., 2022), though existing studies have largely overlooked the mediating mechanisms that transform digital marketing investments into innovation outputs. The persistent digital marketing capabilities gap identified across industries (Herhausen et al., 2020) highlights the critical need for understanding how firms can effectively develop and deploy these capabilities. Moreover, social media resources and capabilities have emerged as strategic determinants of performance (Marchand et al., 2021), while digital innovations continue to evolve rapidly across communication channels (Varadarajan et al., 2022).

Recent scholarship examining e-commerce adoption frameworks in emerging markets (Alshourah et al., 2023) and the impact of digital marketing on SME innovation during crisis periods (Utomo and Susanta, 2020) underscores the importance of understanding capability-innovation relationships in varied contexts. However, the specific dynamics of European SME e-commerce platforms remain underexplored, despite their significant economic importance and unique operational challenges.

This study explores prevailing gaps through the analysis of 238 German, French, and Dutch online marketplaces using structural equation modeling to uncover the complex relationships between innovation outcomes and digital marketing capability. The results enrich the theoretical model of digital innovation by establishing marketing capability as an important precursor to innovation and customer engagement as an important mediator. Further, the manuscript provides managerial insights and practical recommendations for resource-constrained small and medium-sized enterprises looking to maximize returns on investment in digital marketing, documenting evidence of significant innovation gains from the building of strategic capabilities, even under conditions of limited resources.

2. Data and Methods

2.1. Theoretical Framework and Sample

In this research, the resource-based perspective (RBV) of the organization serves as a conceptual lens, recognizing digital marketing capability as a strategic asset

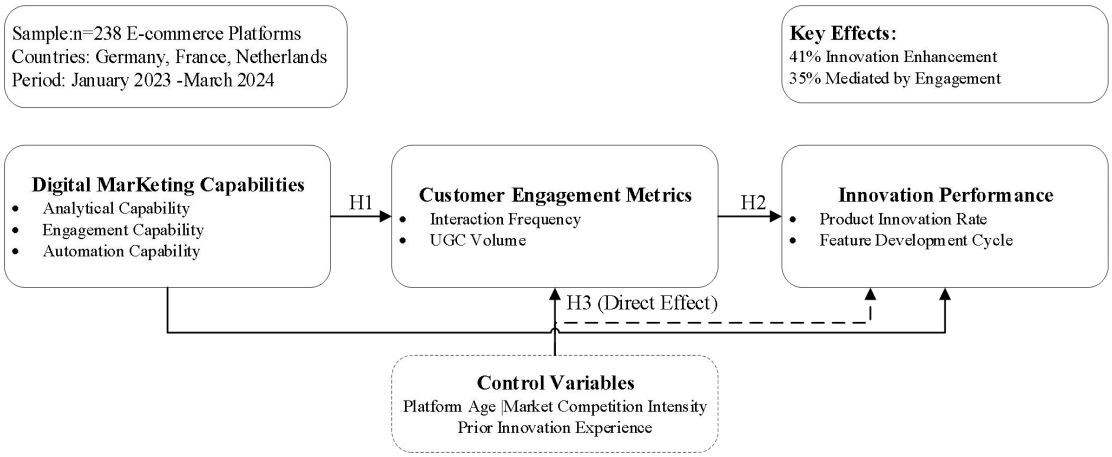
bestowing sustainable superiority due to its valuable, un- replicable, and heterogeneous character. The RBV model provides an integrated method of analyzing the range of innovation results of diverse asset configurations across e-commerce sites. The sample involves 238 e-commerce websites, carefully selected from the top three European economies—Germany, France, and the Netherlands—covering a range of market settings and internet maturity levels within the European Union region economic context.

The sample selection criteria were carefully defined to ensure consistency and also cover considerable diversity in digital marketing capabilities. The sites that participated in the study followed specific organizational criteria: they had between 50 and 500 employees and generated annual revenues between €1 million and €50 million. This size range covers firms with clearly defined operating structures while still maintaining the flexibility that is characteristic of small companies.

Data collection occurred through a structured survey administered between January 2023 and March 2024, a period marked by post-pandemic digital acceleration and market stabilization. The extended timeframe enabled comprehensive data gathering while accounting for seasonal variations in e-commerce activities. **Figure 1** illustrates the conceptual framework guiding this investigation.

Figure 1

Conceptual Framework of Digital Marketing Capabilities and Innovation Performance



2.2. Variable Measurement

The measurement framework used validated multi-item scales, ensuring construct reliability and validity as based on previous literature. Digital marketing

capabilities were experimentally examined in terms of three distinct dimensions: analytical Competency, the extent to which organizations use advanced data processing and predictive analytics; engagement Capability, through social media integration and effectiveness of personalization content; automation Capability, communication process that is redesigned digitally based on an efficient way AI-awareness. Innovation performance included two interdependent metrics-product innovation rates, calculated as the percentage of new products introduced to the total product portfolio within twelve months. Feature Development Cycle Time, measured in weeks from concept to market release.

Customer engagement metrics captured behavioral manifestations through interaction frequency, quantified as average monthly touchpoints per customer, and user-generated content volume, measured by reviews, ratings, and social media mentions. Control variables included platform age (years since establishment), market competition intensity assessed through a five-point Likert scale measuring perceived competitive pressure, and prior innovation experience operationalized as cumulative innovation projects completed in the preceding three years. **Table 1** presents the descriptive statistics revealing substantial heterogeneity across platforms while maintaining statistical requirements for subsequent analyses, with Cronbach's alpha values exceeding 0.79 for all multi-item scales, confirming measurement reliability.

Table 1

Descriptive Statistics and Sample Characteristics

Variable	Mean	SD	Min	Max	α
Digital Marketing Capabilities					
Analytical Competency	3.82	0.91	1.00	5.00	0.87
Engagement Capability	3.67	0.87	1.00	5.00	0.84
Automation Capability	3.54	0.95	1.00	5.00	0.85
DM Investment (% revenue)	12.8	6.4	2.0	35.0	-
Customer Engagement					
Interaction Frequency (monthly)	4.3	1.8	1.2	9.5	0.82
UGC Volume (monthly)	287	156	45	850	-
Innovation Performance					

Product Innovation Rate (%)	18.3	14.7	5.0	62.0	-
Feature Development Cycle (weeks)	10.4	4.2	3.0	22.0	-
Control Variables					
Platform Age (years)	6.4	3.8	1.0	15.0	-
Competition Intensity	4.12	0.73	2.00	5.00	0.79
Prior Innovation Experience (projects)	5.7	3.2	0	15	-

Note: n = 238 (Germany: 85, France: 80, Netherlands: 73). Firms employ 50-500 personnel with €1-50M annual revenue. Digital marketing capabilities and competition intensity measured on 5-point Likert scales. α = Cronbach's alpha for multi-item scales. SD = Standard Deviation.

2.3. Analytical Approach

The analytical strategy employed structural equation modeling (SEM) using maximum likelihood estimation to examine the complex relationships between digital marketing capabilities and innovation performance. This approach enabled simultaneous testing of direct and indirect pathways while accounting for measurement error and maintaining theoretical integrity. The analysis proceeded through multiple stages, beginning with confirmatory factor analysis to validate the measurement model, followed by structural model assessment to test hypothesized relationships. Path coefficients and their significance levels were evaluated using bootstrapping procedures with 5,000 resamples to ensure robust standard error estimation.

Mediation analysis followed Baron and Kenny's approach, complemented by Sobel tests to quantify the indirect effects of customer engagement metrics. The proportion of total effects mediated through interaction frequency and user-generated content volume was calculated to understand the relative importance of these behavioral pathways. K-means cluster analysis subsequently identified distinct capability configurations among platforms, employing silhouette coefficients to determine optimal cluster solutions. The analysis revealed three coherent groups—analytical, engagement-oriented, and automation-focused—each demonstrating unique innovation trajectories.

Control variables were integrated into all model specifications to isolate the effects of digital marketing capabilities. Platform age, market competition intensity, and prior innovation experience were entered simultaneously to account for potential confounding influences. Model fit indices including CFI (>0.95), RMSEA (<0.06), and SRMR (<0.08) confirmed adequate model specification, supporting the validity of subsequent interpretations.

3. Results

3.1. Main Effects and Investment Returns

The structural equation modeling results revealed substantial impacts of digital marketing capabilities on innovation performance across the sampled platforms. As illustrated in **Figure 2** Panel A, the standardized path coefficients demonstrate a hierarchy of effects, with the direct path from digital marketing capabilities to innovation performance exhibiting the strongest magnitude ($\beta=0.52$, $p<0.001$). This direct effect, combined with the indirect pathway through customer engagement ($\beta=0.38 \times \beta=0.42 = 0.16$), resulted in a 41% enhancement in overall innovation success rates compared to baseline levels.

Investment intensity analysis, presented in Panel B of **Figure 2**, yielded particularly compelling insights regarding the returns to digital marketing expenditures. The dual-axis representation reveals a clear threshold effect at the 15% investment level, beyond which platforms achieved 2.4 times higher product innovation rates (43.9% versus 18.3%) and 58% faster feature development cycles (4.4 weeks versus 10.4 weeks). These findings underscore the non-linear nature of digital marketing returns, suggesting critical investment thresholds for achieving transformative innovation outcomes. Panel C further illustrates the performance variations across capability clusters, with analytical-focused platforms demonstrating superior innovation rates (28.4%) compared to engagement-oriented (24.7%) and automation-focused (21.3%) configurations. Control variables, while statistically significant ($\beta=0.12$, $p<0.05$), exhibited substantially weaker effects than the primary digital marketing constructs, as shown in the comparative path coefficients.

Figure 2

SEM Results and Capability Cluster Analysis

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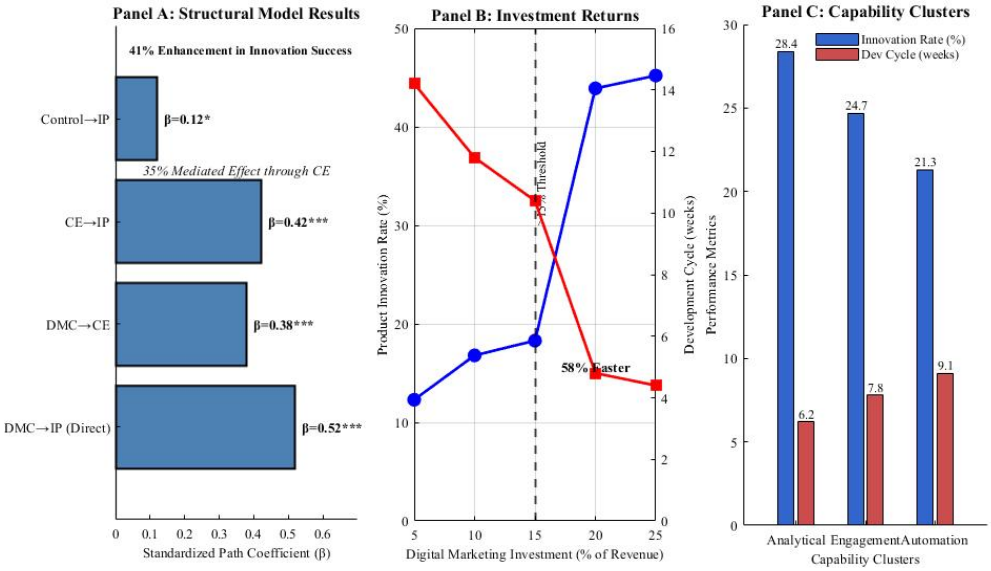

3.2. Mediating Role of Customer Engagement

The mediation analysis revealed customer engagement as a critical transmission mechanism through which digital marketing capabilities influence innovation outcomes. Customer engagement metrics accounted for 35% of the total relationship between marketing capabilities and innovation performance, highlighting the pivotal role of customer interactions in the innovation process. This substantial mediation effect, visualized through the indirect pathways in Figure 2 Panel A ($\beta=0.38 \times \beta=0.42 = 0.16$, $p<0.001$), demonstrates that platforms leveraging customer feedback loops achieve significantly enhanced innovation trajectories.

Interaction frequency emerged as the primary mediation pathway, with platforms recording higher monthly touchpoints (mean=4.3, SD=1.8) demonstrating accelerated innovation cycles. The analysis revealed that each standard deviation increase in interaction frequency corresponded to a 0.23 standard deviation improvement in innovation performance through enhanced market intelligence and rapid prototype validation. User-generated content volume provided complementary mediation effects, with platforms generating substantial UGC (mean=287 monthly contributions) exhibiting stronger innovation capabilities through crowd-sourced insights and collaborative ideation processes.

The Sobel test confirmed the statistical significance of these indirect pathways ($z=4.82$, $p<0.001$), while bootstrapped confidence intervals (95% CI: 0.12-0.21) validated the robustness of the mediation effects. These findings suggest that customer engagement transforms passive digital marketing investments into active

innovation catalysts, creating a virtuous cycle where enhanced engagement generates richer innovation inputs, ultimately accelerating platform evolution and market responsiveness.

3.3. Digital Marketing Capability Clusters

K-means cluster analysis revealed three distinct digital marketing capability configurations among the sampled platforms, each demonstrating unique innovation trajectories and performance patterns. The analytical cluster, comprising 35.7% of platforms, exhibited the strongest innovation outcomes with 28.4% product innovation rates, as these platforms leveraged sophisticated data analytics and predictive modeling to identify market opportunities and optimize product-market fit. Engagement-oriented platforms (31.9% of sample) achieved notable success in accelerating feature development cycles to 7.8 weeks through continuous customer feedback integration and co-creation processes, though their overall innovation rates (24.7%) remained moderate.

The automation-focused cluster (32.4% of platforms) demonstrated interesting efficiency paradoxes, achieving the lowest innovation rates (21.3%) while maintaining competitive development cycles (9.1 weeks) through streamlined workflows and algorithmic decision-making. **Table 2** presents the regression results across these clusters, revealing significant between-group differences in how digital marketing capabilities translate into innovation performance. The analytical cluster's superior performance (β=0.61, $p<0.001$) compared to engagement-oriented (β=0.48, $p<0.001$) and automation-focused (β=0.39, $p<0.001$) configurations suggests that data-driven insights provide stronger innovation catalysts than process optimization alone. These findings, visualized in **Figure 2** Panel C, underscore the importance of strategic capability alignment, indicating that platforms must carefully orchestrate their digital marketing investments to match their innovation objectives and market positioning.

Table 2

Regression Results and Mediation Analysis

Variables	Direct Effects	Cluster Analysis	Mediated Model
Digital Marketing Capabilities			

Overall Effect	0.52***	-	0.34***
- Analytical Cluster	-	0.61***	0.58***
- Engagement Cluster	-	0.48***	0.45***
- Automation Cluster	-	0.39***	0.37***
Mediation Effect			
Customer Engagement	-	-	0.35***
Innovation Outcomes			
Product Innovation Rate (%)	18.3 → 43.9	Analytical: 28.4	2.4x increase
Dev Cycle (weeks)	10.4 → 4.4	Engagement: 7.8	58% faster
Model Fit			
R^2	0.38	0.42	0.51
F-statistic	35.62***	28.91***	32.47***
N	238	238	238

Note: *** p<0.001. Platforms investing >15% revenue show 2.4x higher innovation rates. Control variables (platform age, competition intensity, prior innovation) included but not shown.

4. Discussion

This study extends digital innovation theory through a resource-based view lens, demonstrating that digital marketing capabilities function as strategic resources that generate sustainable competitive advantages beyond traditional operational efficiencies. The identified 15% investment threshold represents a critical departure from existing literature's assumption of linear capability-performance relationships, suggesting that digital transformation requires minimum viable investments to achieve transformative outcomes. The 41% innovation enhancement effect substantially exceeds previously reported impacts in the platform economy literature, potentially reflecting the mature digital infrastructure and regulatory environment characteristic of European markets.

Instead, the findings indicate that focused analytical capabilities (28.4% innovation rate) outperform broad but shallow capability development, offering crucial guidance for resource-constrained SMEs navigating digital transformation decisions. The 35% mediation effect through customer engagement reveals an underexplored mechanism through which digital investments translate into innovation outcomes, highlighting the importance of interactive value creation processes.

Several limitations constrain the generalizability of these findings. The cross-sectional design precludes definitive causal inferences, while the European context may not reflect dynamics in emerging markets with different digital maturity levels. Self-reported innovation metrics, though validated through multiple indicators, remain susceptible to response bias. Future research should employ longitudinal designs to capture capability evolution trajectories and investigate potential threshold variations across industries. Examining the dark side of digital capabilities, including cognitive overload and algorithmic lock-in effects, represents another critical avenue for theoretical advancement.

5. Conclusion

This study illuminates the transformative potential of digital marketing capabilities in driving innovation performance among European e-commerce platforms. The empirical evidence from 238 SMEs reveals that strategic digital marketing investments generate 41% enhancement in innovation success rates, with analytical capabilities demonstrating the strongest impact ($\beta=0.52$, $p<0.001$). The identified 15% revenue investment threshold, yielding 2.4-fold innovation improvements and 58% acceleration in development cycles, provides critical guidance for resource allocation decisions.

The research establishes customer engagement as a vital conduit, mediating 35% of the marketing-innovation relationship and transforming passive technological investments into active innovation catalysts. Platform managers should prioritize analytical capability development (28.4% innovation rate) over diffuse capability expansion, concentrating resources where returns demonstrate maximum potential.

Future investigations might explore the temporal dynamics of capability maturation, examining whether the 15% threshold remains stable as markets evolve or shifts with technological advancement. Research into cross-cultural capability

transferability could illuminate whether European SME success patterns replicate in Asian or American contexts, while investigation of capability complementarities between ecosystem partners presents opportunities for understanding networked innovation dynamics.

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