Research on the Influence of Digital Marketing on Innovation Performance of Time-Honored Chinese Enterprises——Mediation analysis based on Dynamic Capabilities

Qianwen Liang, Meng Zhao*

Beijing Institute of Fashion Technology, No.1A Paeonia Residence, Chaoyang District, Beijing IN 100029, China

*fzyzm1@bift.edu.cn

Abstract. Based on panel data from 49 listed Chinese time-honored brands (2016–2023), this study examines the impact of digital marketing on innovation performance and the mediating role of dynamic capabilities. The results indicate that digital marketing significantly enhances innovation performance, with absorptive, innovative, and adaptive capabilities all serving as significant mediators. These findings suggest that firms should adopt digital marketing as a core strategy and strengthen dynamic capabilities, while policymakers should support technological infrastructure and resource allocation to promote sustainable innovation.

Keywords: digital marketing, time-honored chinese brands, innovation performance, dynamic capability

1 Introduction

Time-honored Chinese Brands represent a significant heritage of commercial civilization, bearing dual missions of economic value and cultural inheritance. However, amid shifting consumer demographics and digital transformation, many face challenges such as insufficient innovation momentum and slow market responsiveness, leading to declining market share and influence among younger consumers[1]. In this context, enhancing innovation performance has become crucial for their sustainable development.

Digital marketing, driven by digital technology, integrates diverse data to advance marketing intelligence[2][3], transcending traditional offline limitations[4] and enabling enhanced market engagement and innovation. In 2023, China's Ministry of Commerce emphasized upgrading marketing through big data and cloud computing, highlighting digital marketing's key role in revitalizing time-honored brands.

Existing studies indicate digital marketing enhances innovation through multiple pathways, including improved targeting[5], information integration[6], strategic innovation[7], and channel-driven brand crossover[8]. However, its effectiveness and

N. B. Abdul Ghani et al. (eds.), *Proceedings of the 2025 6th International Conference on Big Data and Social Sciences (ICBDSS 2025)*, Advances in Computer Science Research 126,
https://doi.org/10.2991/978-94-6239-598-5_17

mechanisms in the specific context of time-honored brands remain unexamined, creating a research gap with significant theoretical and practical implications for brand sustainability.

2 Theoretical Analysis and Research Hypotheses

2.1 Digital Marketing and the Innovation Performance of Time-honored Enterprises

Digital marketing enables time-honored enterprises to reach users through multiple channels and interact in real time, facilitating accurate identification of market trends and consumer preferences[9]. By integrating user data to create precise profiles, firms can enhance the accuracy of innovation decisions. Furthermore, diverse sales scenarios on digital platforms compel increased innovation investment, while reduced marketing costs free up resources for product upgrades[10][11]. Accordingly, the following hypothesis is proposed:

H1: Digital marketing has a significant role in promoting the innovation performance of time-honored enterprises.

2.2 The Mediating Role of Dynamic Capabilities

Dynamic capability is a key strategic capability for enterprises to integrate internal and external resources to respond to environmental changes, and constitutes an important bridge for digital marketing to affect innovation performance. Based on the research of Wang and Ahmed (2007)[12], this study divides it into three dimensions: absorptive capacity, innovation ability, and adaptability. Digital marketing broadens the information acquisition channels of time-honored brands, promotes enterprises to improve information processing and knowledge integration capabilities, and transforms external information into innovative output. Absorption capacity plays a key mediating role in this process. Based on this, hypotheses are proposed:

H2: Absorptive capacity plays a mediating role between digital marketing and the innovation performance of time-honored enterprises

Digital marketing can activate the innovation ability of enterprises, achieve demand-driven innovation through in-depth mining of user behavior, market trends and other data, and reduce innovation uncertainty. Based on this, hypotheses are proposed:

H3: Innovation ability plays a mediating role between digital marketing and the innovation performance of time-honored enterprises

The real-time characteristics of digital marketing enable enterprises to perceive market signals in a timely manner, dynamically adjust R&D and resource allocation, and strengthen brand identity and product iteration efficiency through user co-creation mechanisms, thereby improving adaptability and promoting innovation. Based on this, hypotheses are proposed:

H4: Adaptability plays a mediating role between digital marketing and the innovation performance of time-honored enterprises

3 Variable Selection,Model Specification, and Data Description

3.1 Data Sources

This study employs a sample of 49 Chinese Time-honored Listed Enterprises from 2016 to 2023, selected based on official recognition and data availability. Data are sourced from the CSMAR and CNRDS databases, corporate annual reports, and Hexun.com social responsibility reports

3.2 Variable Selection

Dependent Variable: Innovation Performance (Innovate)

Corporate innovation performance is measured by the total number of patent applications (including invention, utility model, and design patents), following common practice in contexts where new product revenue data is unavailable[13]. The variable is calculated as the natural logarithm of the annual patent count plus one

Independent Variable: Digital Marketing (Dig-Mar)

Following Qiao et al.[7], digital marketing is measured by constructing a keyword lexicon covering three dimensions—platform, media, and relationship—and calculating their frequency in corporate reports

Mediating Variable: Dynamic Capabilities

Following Yang et al.[14], dynamic capabilities are assessed through the three dimensions of absorptive, innovative, and adaptive capacity.

Control Variables

The following control variables are included: firm size (Size), firm age (Age), asset-liability ratio (Lev), Tobin's Q (TobinQ), return on equity (Roe), and the proportion of independent directors (Ind).

3.3 Model Specification

To test the previously stated H1, the following baseline model is established:

$$Innovate\{i,t\}=\alpha 0+\alpha 1 Dig\text{-}Mar\{i,t\}+\alpha 2 Control\{i,t\}+\delta i+\lambda t+\varepsilon\{i,t\} \quad (1)$$

Among these, Innovate$\{i,t\}$represents the innovation performance of firm i in period t; Dig-Mar$\{i,t\}$ denotes the digital marketing capability of firm i in period t; Controls$\{i,t\}$ signifies the set of relevant control variables; δ and λ represent firm and time fixed effects, and ε is the error term.

To examine the mediating mechanisms, the following models are constructed based on the proposed hypotheses:

$$DC\{i,t\}=\beta 0+\beta 1 Dig\text{-}Mar\{i,t\}+\beta 2 Control\{i,t\}+\delta i+\lambda t+\varepsilon\{i,t\} \quad (2)$$

$$Innovate\{i,t\}t=\gamma 0+\gamma 1 Dig\text{-}Mar\{i,t\}+\gamma 2 DC\{i,t\}+\gamma 3 Control\{i,t\}+\delta i+\lambda t+\varepsilon\{i,t\} \quad (3)$$

Among these, DC represents the mediating variable of dynamic capabilities, comprising absorptive capacity (AC), innovative capacity (IC), and adaptive capacity (AD). Other variables remain consistent with Equation (1).

4 Empirical Analysis

4.1 Baseline Regression Analysis

Table 1 presents the regression results of Equation (1) estimated using Stata 14.0. The coefficient of digital marketing (Dig-Mar) is significantly positive at the 1% level regardless of control variables. With controls, the coefficient reaches 2.1415, supporting H1 that digital marketing positively affects innovation performance.

Table 1. Baseline regression analysis

Variable Name	(1)	(2)
Dig-Mar	2.0214***	2.1415***
	(0.6320)	(0.5619)
Size	-	0.3315*
		(0.1992)
Age	-	8.1829***
		(1.1989)
Lev	-	-1.9148***
		(0.6978)
Tobin Q	-	0.0341*
		(0.0201)
Roe	-	2.1976***
		(0.6206)
Ind	-	2.0335***
		(0.6779)
_cons	3.1861***	-30.7566***
	(0.0498)	(5.6321)
Firm Fixed Effects	Yes	Yes
Time Fixed Effects	Yes	Yes
R^2	0.785	0.836

Note: *, ** and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively. Figures in parentheses are t-statistics. The same as below.

4.2 Mediation Effect Analysis

The test results of the mediating effects of the three dimensions of dynamic capabilities (absorptive capability, innovative capability, and adaptive capability) are shown in Table 2.

Absorptive Capacity

Column (1) shows that the coefficient of digital marketing on absorptive capability is significantly positive at the 1% level; in column (2), both coefficients of digital marketing and absorptive capability are significant. The results indicate that absorptive capability plays a mediating role, and Hypothesis H2 is supported.2.

Innovative Capacity

Column (3) shows that the coefficient of digital marketing on innovative capability is significantly positive at the 5% level; in column (4), both coefficients of digital marketing and innovative capability are significant. The results indicate that innovative capability plays a mediating role, and Hypothesis H3 is supported.3.

Adaptive Capacity

Column (5) shows that the coefficient of digital marketing on adaptive capability is significantly positive at the 5% level; in column (6), both coefficients of digital marketing and adaptive capability are significant. The results indicate that adaptive capability plays a mediating role, and Hypothesis H4 is supported.

Table 2. Mediating Effect Results of Dynamic Capabilities

Variable Name	(1) AB	(2) Innovate	(3) IN	(4) Innovate	(5) AD	(6) Innovate
Dig-Mar	0.0896*** (0.0327)	1.9163*** (0.5629)	0.0182** (0.0073)	1.4950*** (0.5043)	0.5805** (0.2292)	1.9266*** (0.5616)
AB	-	2.5119*** (0.9288)				
IN			-	35.5625*** (3.7493)		
AD					-	0.3702*** (0.1324)
_cons	-0.4161 (0.3277)	-29.7115*** (5.5933)	-0.1989*** (0.0729)	-29.7115*** (5.0632)	-3.2432 (2.2975)	-29.5561*** (5.5923)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.927	0.839	0.919	0.871	0.919	0.871

4.3 Robustness Tests

Robustness checks were conducted by replacing the explanatory variable, winsorizing key variables at the 1% level, and applying the Bootstrap method. As shown in Table 3, the coefficient of digital marketing (Dig-Mar) remains significantly positive across all tests, confirming the robustness of the baseline regression results.

Table 3. Robustness Test Results

Variable Name	Substitution Method for Explained Variables	Truncation Method	Bootstrap
	(1)	(2)	(3)
Dig-Mar	1.396**	2.302***	2.1415***
	(0.538)	(0.586)	(0.4637)
_cons	-30.857***	-33.074***	-30.7566***
	(5.241)	(5.927)	(6.5675)
Control Variables	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes
Time Fixed Effects	Yes	Yes	Yes
R^2	0.335	0.332	0.836

5 Conclusion and Implications

Based on panel data from 49 listed Chinese time-honored brands (2016-2023), this study examines digital marketing's impact on innovation performance and the mediating role of dynamic capabilities. Results show that: (1) digital marketing significantly enhances innovation performance; (2) dynamic capabilities and their three dimensions (absorptive, innovative, and adaptive capacities) all demonstrate significant mediating effects.Based on the research findings, the following insights are proposed:

5.1 Strategic-Level Implications

Position digital marketing as the core strategy for driving overall transformation and innovation, deepen data mining and application, promote user co-creation and agile iteration, and systematically enhance dynamic capabilities.

5.2 Policy-Level Implications

It is recommended to strengthen training in data literacy and digital marketing capabilities, build industry-level data sharing platforms, optimize fiscal and tax resource support, encourage cross-sector collaboration and innovation ecosystem development, and improve the protection mechanisms for innovation achievements of time-honored brands.

References

[1] Shang Y, Wang H M, Chen C R.:Research on the Impact and Mechanism of Digital Marketing on the Performance of Time-honored Brands. Journal of Commercial Economics, (06), 159-162. (2025).

[2] Li X Y, Zhao Y.:The Application Value and Implementation Path of Digital Marketing in Enterprise Marketing Activities. Time-honored Brand Marketing, (24), 20-22.(2023).

[3] Wang Z T, Zhang Q, Huang Y X.:. Research on digital marketing transformation strategy of Baijiu enterprises in Guizhou. China Brewing, 43(03), 260-263. (2024)

[4] Guo F, Xiong Y J, Shi Q L, Wang Q Y.:The Re-estimation of Digital Economy and Economic Development in Administrative Border Areas: Evidence from Nighttime Light Data. Journal of Management World, 39(04), 16-33. (2023).

[5] Yan Y.: The Impact of Digital Marketing on Corporate Performance. Vitality, 41(22), 94-96. (2023).

[6] Song W.:Research on the Influence of Digital Marketing on Innovation Performance of Retail Enterprises—— Mediation analysis based on information capture and information integration capabilities. Journal of Commercial Economics, (19), 163-166. (2024).

[7] Qiao P H, Xue R, Han X F.: (2024). How Does Digital Marketing Stimulate SMEs' Innovation? Based on the Mediating Effect of Information Dynamic Capabilities. Nankai Business Review, 27(05), 40-50+77.

[8] Li M L, Du J.: Innovation of Time-honored Brands' Business Models Empowered by Digital Marketing. Journal of Tianjin College of Commerce, 13(01), 63-70. (2025).

[9] Tai Y J, Zhang N.:The Impact of Digital Marketing Strategies on Brand Equity for Established Brands: Examination of the Mechanisms Affecting Competition in the Market. Journal of Henan Institute of Technology, 33(03), 39-43. (2025).

[10] Jung, S. U., Shegai, V.:The impact of digital marketing innovation on firm performance: Mediation by marketing capability and moderation by firm size. Sustainability, 15(7), 5711.(2023).

[11] P.K. Kannan, Hongshuang “Alice” Li.:Digital marketing: A framework, review and research agenda. International Journal of Research in Marketing, 34(1), 22-45. (2016).

[12] Wang, C. L., Ahmed, P. K.:“Dynamic Capabilities: A Review and Research Agenda”. International Journal of Management Reviews, Vol.9, pp. 31-51. (2007).

[13] Li D D.:Research on the Impact of Government R&D Subsidies on Enterprise Innovation Performance——Based on the Perspective of Enterprise Scale and Property Heterogeneity. China Journal of Economics, 9(01), 141-161. (2022).

[14] Yang L, He X, Gu H F.:Top Management Team's Experiences, Dynamic Capabilities and Firm's Strategy Mutation: Moderating Effect of Managerial Discretion. Journal of Management World, 36(06), 168-188+201+252. (2020).