

A Study on the Mechanism of Digital Capability and Competitiveness Enhancement of Small and Medium-Sized Enterprises in the E-Commerce Platform Context

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Abstract: This study aims to explore the mechanism through which the digital capability of small and medium-sized enterprises (SMEs) enhances their competitiveness in the context of e-commerce platforms. Through a systematic literature review and theoretical analysis, this paper constructs an analytical framework in which digital capability influences enterprise competitiveness via two pathways: resource integration and innovation-driven development. It further examines the dynamic evolution of digital capability and its positive feedback effects within platform ecosystems. The findings reveal that digital capability not only improves the efficiency of resource allocation and the speed of market response but also drives innovation in products, marketing, and supply chains, thereby creating differentiated competitive advantages. Moreover, through data accumulation and organizational learning, digital capability enables continuous iteration and growth. The conclusions suggest that SMEs should incorporate digital transformation into their long-term strategies, consistently invest in technology, talent, and organizational optimization, and actively participate in platform ecosystem collaboration to achieve long-term and sustainable competitiveness enhancement.

Keywords: SMEs; Digital Capability; E-commerce Platforms; Resource Integration; Innovation-Driven Development; Competitiveness

1. Introduction

In the era of the digital economy, e-commerce platforms have become critical infrastructure for enterprises to participate in market competition, expand customer resources, and create value.

Compared with traditional offline channels, e-commerce platforms offer higher efficiency, lower transaction costs, and broader market coverage, providing SMEs with unprecedented development opportunities [1]. For resource-constrained SMEs, e-commerce platforms not only lower the barriers to market entry but also help them quickly reach target customers through platform traffic distribution mechanisms, data analytics tools, and technical support, thereby enabling precision marketing and efficient operations. However, market competition within e-commerce platforms has become increasingly intense, as the number of firms operating on these platforms continues to grow. Product homogenization is common, price competition pressure is mounting, and enterprises face new challenges for survival and growth.

Against this backdrop, digital capability has become a key factor determining whether SMEs can stand out in e-commerce platforms. Digital capability encompasses not only the basic level of informatization but also an enterprise's comprehensive ability to integrate digital resources, apply digital technologies, and use data for decision-making [2]. It reflects the enterprise's ability to sense markets, integrate resources, and create value within the platform ecosystem, and serves as an important source of competitiveness. From a theoretical perspective, digital capability can be regarded as a critical manifestation of dynamic capability, determining whether enterprises can quickly respond to changes in the external environment, leverage platform empowerment, and achieve innovative breakthroughs and sustainable growth [3].

Existing research shows that firms with higher levels of digital capability are better able to utilize platform-provided data and technology to optimize business processes and enhance

customer experience, thereby gaining a competitive advantage [4]. However, current studies on the mechanism through which digital capability affects SME competitiveness in the e-commerce platform context remain insufficiently systematic. In particular, few studies have analyzed the dimensions of digital capability and revealed its pathways to competitiveness formation from a theoretical perspective.

Based on this, this paper aims to systematically identify the core dimensions of SME digital capability under the e-commerce platform context, explore its mechanism of action, and construct an analytical framework for digital capability and competitiveness enhancement. Furthermore, this paper examines the main obstacles SMEs face in building digital capability, including insufficient investment in digital technologies, weak data governance capabilities, talent shortages, and platform dependency, with the goal of proposing practical, actionable recommendations. This research not only contributes to enriching the theoretical system of platform economy and SME digital transformation but also provides valuable reference for SMEs in formulating digital strategies and improving market performance.

2. Literature Review

2.1 E-Commerce Platforms and SME Research

With the rapid development of the digital economy, e-commerce platforms have gradually become an essential vehicle for connecting enterprises with consumers, facilitating transactions, and creating value. Studies have shown that e-commerce platforms play a critical role in reducing transaction costs, expanding market coverage, and improving resource allocation efficiency—benefits that are especially significant for SMEs [5]. Traditional SMEs are often constrained by limited capital, distribution channels, and talent, making it difficult to compete head-on with large firms in broader markets. E-commerce platforms, however, provide a low-cost entry point that allows SMEs to access vast user bases with relatively modest resource input, shorten market validation cycles, and quickly achieve scalable growth.

Scholars have generally focused on how e-commerce platforms reshape SMEs' business models and value creation processes. On one

hand, platform traffic distribution mechanisms allow SMEs to reach target customers through precise recommendations, thereby improving conversion and repurchase rates [6]. On the other hand, platform-provided data resources and digital tools enhance enterprises' market insight and operational efficiency [7]. For instance, by leveraging the platform's big data analytics capabilities, SMEs can more accurately forecast demand, optimize inventory, and adjust pricing strategies, thus achieving refined operations. In addition, e-commerce platforms offer integrated services such as payment, logistics, and customer support, further lowering operational barriers and enabling enterprises to focus more on product and brand innovation.

Nevertheless, the high concentration and intense competition on e-commerce platforms also present new challenges. As more and more enterprises enter the platform ecosystem, product homogenization issues have become increasingly severe, price competition has become the norm, and profit margins are continually compressed. Moreover, excessive reliance on platforms may lead SMEs to suffer from weak bargaining power and higher risks from platform policy changes. Therefore, how SMEs can build unique capability systems to enhance their competitiveness and avoid falling into price wars and low-profit traps has become a focal point of both research and practice.

2.2 The Connotation and Components of Digital Capability

Digital capability refers to an enterprise's comprehensive ability to integrate resources, apply technologies, and create value in a digitalized environment, and it is regarded as a key driver of digital transformation and competitiveness enhancement [2]. Scholars generally agree that digital capability goes beyond the mastery of technical skills and also encompasses an enterprise's cognitive, organizational, and strategic adaptability [8]. Enterprises must combine digital technologies and market information with their own resources, engage in continuous learning and improvement, and transform digital opportunities into tangible business outcomes.

From a cognitive perspective, digital capability is manifested in the management's sensitivity and insight into digital trends, allowing them to promptly identify market opportunities brought about by digital technologies and adjust strategic

plans accordingly [9]. From a technological perspective, digital capability means that enterprises can effectively leverage tools such as big data, cloud computing, and artificial intelligence to improve operational efficiency and decision-making quality, while also driving product and service innovation [10]. From an organizational perspective, digital capability is reflected in the enterprise's structural and procedural support for digitalization, including cross-departmental collaboration, knowledge sharing, and information security management, ensuring that digital initiatives are implemented effectively [11].

Overall, digital capability is a multidimensional and integrated system involving cognitive, technological, and organizational aspects, and its formation is a dynamic and evolving process. For SMEs, improving digital capability can help overcome resource constraints, enhance market responsiveness, and strengthen adaptability and competitiveness in the e-commerce platform environment. Therefore, exploring the connotation and components of digital capability not only helps to improve the theoretical research framework but also provides practical guidance for enterprise digital transformation.

2.3 Theoretical Foundations of Enterprise Competitiveness

Enterprise competitiveness refers to a firm's comprehensive ability to gain sustainable advantages and achieve superior returns in the market. Scholars have explored this concept from multiple theoretical perspectives. The classic resource-based view posits that a firm's competitiveness stems from its resources and capabilities that are rare, inimitable, and non-substitutable [12]. In the context of the digital economy, this perspective has been extended to regard digital resources, data assets, and digital capability as new strategic resources that are critical drivers of enterprise competitiveness [13]. The dynamic capability theory further emphasizes that enterprises operating in rapidly changing environments must continuously sense external changes, seize new opportunities, and reconfigure internal resource allocations to maintain competitive advantages [14]. Digital capability is precisely an important manifestation of dynamic capability, enabling enterprises to make agile decisions, iterate quickly, and engage in continuous innovation. Furthermore, competitive advantage theory

highlights that enterprise competitiveness is not only derived from internal resources but is also closely linked to the external environment [15]. E-commerce platforms, as a typical digital external environment, offer enterprises diverse partners, massive user bases, and open opportunities for innovation. Whether an enterprise can effectively embed itself in the platform ecosystem and build synergistic relationships with other participants determines whether it can stand out in fierce competition. Therefore, investigating how SMEs can enhance their digital capability and build differentiated competitive advantages in platform environments holds significant theoretical value.

3. Theoretical Analysis

3.1 Digital Capability and Resource Integration

In the e-commerce platform context, resource integration capability forms a crucial foundation for SME competitiveness. Compared with large enterprises, SMEs have limited resources and weaker risk resilience, making them more dependent on external platform resources and data support. They must efficiently integrate internal and external resources to offset their inherent limitations. Enhancing digital capability enables enterprises to identify, absorb, and utilize external resources more quickly. By leveraging big data analytics and platform backend insights, enterprises can track market trends, monitor consumer behavior changes in real time, and adjust product portfolios and inventory strategies accordingly, thereby reducing stockouts and overstock risks.

Moreover, digital capability helps enterprises break down information silos, achieve interconnectivity across different stages of operations, and minimize resource waste. For example, with ERP systems and smart inventory management, enterprises can automatically adjust production plans based on real-time platform orders, implementing demand-driven production that reduces raw material usage and lowers production costs. By integrating API interfaces with logistics platforms, enterprises can automate order allocation and tracking, significantly improving fulfillment efficiency and customer satisfaction.

More importantly, digital capability facilitates multi-party collaborative resource integration. E-commerce platforms bring together suppliers,

logistics providers, financial service institutions, and marketing partners. By leveraging digital interfaces, SMEs can embed themselves into this ecosystem and connect with diverse resources quickly. For example, small brands can access credit loans through platform-provided financial products to solve cash flow problems or use platform analytics services to conduct precision marketing, achieving optimal resource allocation at relatively low cost.

3.2 Digital Capability and Innovation-Driven Development

Innovation is a critical factor that enables SMEs to stand out within the platform ecosystem. Digital capability not only provides the tools for innovation but also reduces the risks and costs of trial and error. Through data analytics, enterprises can better understand actual consumer needs and achieve demand-driven innovation. For example, by conducting sentiment analysis on user reviews and social media content, enterprises can identify potential pain points in the market and develop products that meet consumer preferences ahead of competitors, thereby seizing first-mover advantages.

Digital capability also promotes innovation in marketing models and user experience. SMEs can leverage platform features such as live streaming, short videos, and community interactions to create immersive consumption scenarios, enhance consumer engagement, and strengthen brand awareness and loyalty. With personalized recommendation algorithms, enterprises can tailor differentiated marketing strategies for various user segments, thereby increasing conversion and repurchase rates.

Digitalizing the supply chain is another crucial component of innovation-driven growth. Through blockchain traceability and IoT monitoring, enterprises can ensure product quality and safety, thereby enhancing consumer trust. Predictive algorithms can be used to optimize restocking and distribution processes, improving supply chain resilience and agility. This form of digital capability-driven innovation extends beyond technological improvements to include organizational process reengineering and business model restructuring, offering SMEs multiple pathways for breakthrough development.

3.3 Digital Capability and Competitiveness

Enhancement Pathways

Resource integration and innovation-driven development are mutually reinforcing, forming a dual-engine mechanism through which digital capability enhances competitiveness. Resource integration improves operational efficiency and resource utilization, laying a solid foundation for competitiveness, while innovation-driven development enables enterprises to differentiate themselves amid fierce competition, avoiding price wars. Through the combined effects of digital capability, SMEs can increase brand value, expand their user base, and strengthen their bargaining power and market share.

This competitiveness enhancement process is not one-off but rather a dynamic and iterative one. As digital capability continues to improve, an enterprise's influence and traffic allocation power within the platform ecosystem increase, which further strengthens its resource acquisition and innovation capacity, forming a positive feedback loop. In a highly dynamic e-commerce environment, enterprises that can quickly adapt to platform rule changes and adjust strategies in a timely manner are more likely to establish sustainable competitive advantages.

3.4 Dynamic Evolution and Positive Feedback of Digital Capability

Digital capability is not achieved overnight but is gradually accumulated and continuously evolving. SMEs at different stages of digital development face distinct priorities in capability building. In the initial stage, enterprises focus on introducing digital tools, such as setting up online stores, enabling platform payment and logistics interfaces, and achieving digital access to business processes. At the growth stage, enterprises accumulate operational data and shift their focus toward data-driven decision-making and process reengineering, including precision pricing, dynamic promotions, and user segmentation management. At the mature stage, enterprises go beyond relying on platform resources to proactively participate in platform event planning and ecosystem rule-making. Some even influence platform policies through brand power, transitioning from "platform followers" to "ecosystem collaborators."

This evolutionary process is accompanied by organizational learning and the accumulation of data assets. User, transaction, and supply chain data accumulated through continuous operations not only enhance the quality of current decision-

making but also form unique data barriers and knowledge assets, boosting future competitiveness. Over time, an enterprise's position within the digital ecosystem rises, enabling it to access more traffic and resources, scale operations, and optimize profitability. Ultimately, this creates a positive cycle of "capability enhancement—resource accumulation—reinvestment—further capability enhancement."

This mechanism highlights the long-term strategic significance of digital capability building. SMEs must view digital transformation as a process of continuous investment and iterative optimization rather than a one-time project. Only by continuously upgrading digital technologies, optimizing organizational processes, and cultivating digital talent can they maintain growth and resilience in the highly competitive e-commerce platform environment.

4. Conclusion

This paper systematically analyzes the mechanism through which digital capability enhances the competitiveness of SMEs on e-commerce platforms. The research shows that digital capability, by strengthening resource integration and promoting innovation-driven development, provides SMEs with a dual engine for sustainable growth. Resource integration enables enterprises to optimize internal and external resource allocation, reduce operating costs, and improve efficiency, while innovation-driven development helps create differentiated competitive advantages, increase consumer stickiness, and expand market share.

In addition, this study emphasizes the dynamic evolution and positive feedback nature of digital capability. The process of building digital capability is progressive, involving continuous learning, iterative upgrading, and organizational adaptation. Through the accumulation of data assets and experience, SMEs can gradually shift from passive participation to active collaboration within platform ecosystems, forming unique competitive barriers and long-term advantages. For SMEs, digital transformation should not be regarded as a one-off project but as a long-term strategic task. Enterprises need to maintain continuous investment in digital infrastructure, data analytics, and talent cultivation, as well as actively participate in ecosystem collaboration to secure a more advantageous position in platform traffic and resource allocation. This will help

them achieve steady growth and enhance their resilience to market fluctuations.

Overall, improving digital capability is a necessary path for SMEs to enhance competitiveness in the e-commerce platform era. This study provides a theoretical framework and analytical perspective that can offer guidance for SMEs in formulating digital development strategies and for platforms in designing support policies for SME growth.

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