INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH AND ANALYSIS

ISSN(print): 2643-9840, ISSN(online): 2643-9875

Volume 08 Issue 03 March 2025

DOI: 10.47191/ijmra/v8-i03-52, Impact Factor: 8.266

Page No. 1356-1359

The Role of Technological Absorption Capacity in Enhancing Business Performance in Vietnam

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ABSTRACT: In the context of vigorous digital transformation and technological innovation, enhancing technological absorptive capacity has become a critical factor for businesses to improve performance and maintain competitive advantages. In Vietnam, the ability of enterprises to adopt and apply technology remains limited due to disparities in workforce qualifications, insufficient research and development capabilities, and ineffective collaboration between businesses and scientific and technological organizations. Additionally, investment capital for technology is constrained, while the legal environment and supportive policies have not kept pace with the rapid development of the digital economy, creating numerous barriers in the process of innovation and technology adoption. This study aims to analyze the role of technological absorptive capacity in business performance in Vietnam, identify key challenges, and propose solutions to enhance the ability of enterprises to adopt and apply technology effectively.

KEYWORDS: Technological absorptive capacity, business performance, Vietnam.

I. INTRODUCTION

In an era defined by rapid technological evolution, the ability of enterprises to harness innovation has emerged as a cornerstone of economic success. Central to this dynamic is the concept of absorptive capacity, first introduced by Cohen and Levinthal (1990) as a firm's capability to identify, assimilate, and exploit external knowledge, particularly technological advancements, to enhance its operational and strategic outcomes. This framework has since been widely adopted to explain how organizations translate technological opportunities into competitive advantages. Research by Zahra and George (2002) further refines this concept, distinguishing between potential absorptive capacity (acquiring and assimilating knowledge) and realized absorptive capacity (transforming and exploiting knowledge), emphasizing its multi-dimensional role in fostering innovation and productivity. Globally, empirical studies have demonstrated that firms with robust absorptive capacity achieve superior performance, particularly in technology-intensive industries. For example, a study by Tsai (2001) analyzing 152 manufacturing firms in Taiwan found that absorptive capacity significantly mediates the relationship between R&D investment and firm profitability, underscoring its practical implications.

The relevance of absorptive capacity extends beyond developed economies, gaining prominence in emerging markets where technological adoption is both a challenge and an opportunity. The World Bank (2020) highlights that in developing countries, the effective integration of advanced technologies—such as automation, artificial intelligence, and digital platforms—can accelerate economic growth, yet many firms struggle with inadequate infrastructure, limited human capital, and weak institutional support. This duality is particularly pronounced in Vietnam, a Southeast Asian nation undergoing a remarkable economic transformation. Over the past two decades, Vietnam has transitioned from an agrarian economy to a manufacturing and export-driven powerhouse, with its GDP growth averaging 6-7% annually (World Bank, 2023). This progress has been fueled by foreign direct investment (FDI) and an increasing emphasis on technological modernization, as evidenced by the government's National Strategy on the Fourth Industrial Revolution to 2030, which aims to position Vietnam as a regional leader in Industry 4.0 (Nguyen, 2021).

Despite these advancements, Vietnamese enterprises face significant hurdles in fully leveraging technology to enhance performance. According to a report by the Asian Development Bank (ADB, 2022), while large corporations and FDI-backed firms have begun adopting digital tools—such as enterprise resource planning (ERP) systems and e-commerce platforms—small and

medium enterprises (SMEs), which constitute over 97% of businesses in Vietnam, lag behind. These SMEs often lack the financial resources, skilled workforce, and organizational readiness to absorb and implement new technologies effectively. The study by Cisco (2019) indicates that only about 18% of small and medium enterprises (SMEs) in Vietnam successfully invested in cloud technology, a key component of digital transformation, while the majority of the remaining businesses faced significant barriers such as a lack of technical skills and high implementation costs. Moreover, Vietnam's heavy reliance on imported technology from countries like China, South Korea, and Japan raises concerns about technological dependence and limited domestic innovation capacity (OECD, 2021).

This paper seeks to explore the critical role of absorptive capacity in elevating enterprise performance within the Vietnamese context. By examining the interplay between technological adoption and firm-level outcomes, it aims to address key questions: How does absorptive capacity influence productivity and competitiveness among Vietnamese firms? What are the current barriers to its development, and how can they be overcome? Drawing on global theoretical frameworks and localized empirical insights, this study contributes to the growing discourse on technology absorption in emerging economies. Vietnam's unique position—balancing rapid growth with structural constraints—offers a rich case study to understand how absorptive capacity can serve as a catalyst for sustainable enterprise development in the digital age.

II. CURRENT SITUATION

Over the past two decades, according to the World Bank, Vietnam's ranking in technology transfer has consistently lagged behind regional counterparts such as Singapore, Thailand, and Indonesia. The primary reason for this is the weak linkage between domestic enterprises and foreign direct investment (FDI) enterprises. Most FDI enterprises operating in Vietnam are wholly foreign-owned, export-oriented, and primarily invest to leverage low-cost advantages rather than developing domestic supply chains. In terms of the Artificial Intelligence (AI) Readiness Index, Vietnam scored 54.48 points in 2023, ranking 5th in ASEAN, up one place from the previous year. However, compared to leading countries in the region, Vietnam still needs to make greater efforts to keep pace with global technological trends.

Amid the global digital transformation, Vietnamese enterprises are facing both opportunities and challenges in applying technology to their production and business operations. Technology adoption is not limited to production automation but also extends to areas such as enterprise management, supply chain optimization, and enhancing customer experiences. However, the level of technology adoption varies significantly among enterprises, depending on their scale, industry, and financial capacity.

The technological absorption capacity of Vietnamese enterprises in the industrial manufacturing sector remains limited, especially in the context of digital transformation and global competition. Currently, most industrial manufacturing enterprises still rely on average or outdated technology, with the rate of high-tech application being only around 20%, significantly lower than regional countries such as Singapore (73%) and Thailand (31%). This is most evident in industries such as mechanical engineering, electronics, textiles, and food processing, where many enterprises still depend on outdated production lines imported from China, South Korea, or Japan, with an average age of over 15 years.

Research and development (R&D) activities in industrial manufacturing enterprises have also not been prioritized. Most small and medium-sized enterprises (SMEs) focus solely on order-based production or outsourcing for foreign partners without investing in technological innovation. Larger enterprises, particularly in the automotive and electronic components sectors, do invest in R&D but mainly focus on improving existing technologies rather than developing new ones. This limits the domestic capacity to independently develop and master advanced technologies.

Moreover, the linkage between domestic manufacturing enterprises and FDI enterprises remains weak. In industrial supply chains, particularly in the automotive and electronics sectors, most core components and equipment are still produced by foreign enterprises, while Vietnamese enterprises primarily supply low-value-added auxiliary products. Even in industries such as steel, cement, and chemicals—where Vietnam has many large enterprises—core technologies are still controlled by foreign partners, restricting the technological absorption capacity of domestic enterprises.

In recent years, Vietnam's e-commerce sector has experienced robust growth, with an 18% increase in 2024, reaching a total value of $22 billion. However, the technological absorption capacity of enterprises in this sector remains limited. Many enterprises, especially SMEs, have not effectively utilized digital technologies in their operations. The adoption of advanced solutions such as artificial intelligence (AI), big data analytics, and blockchain remains low, leading to inefficiencies in operations, customer management, and user experience enhancement. Additionally, although Vietnam's IT infrastructure is improving, challenges remain in terms of internet speed, stability, and data security. Many e-commerce enterprises have not invested sufficiently in security systems, increasing the risks of information breaches and transaction fraud.

Vietnam's banking and finance sector has witnessed significant digital transformation in recent years. Commercial banks have actively adopted digital technologies, leading to positive changes in their operational and management models. According to the

State Bank of Vietnam, the application of digital technologies has helped banks improve operational efficiency and enhance customer experiences. Furthermore, innovation in the banking and finance sector is being driven by the adoption of new technologies such as blockchain and artificial intelligence.

The application of high technology in Vietnam's agriculture has achieved some encouraging results. By 2022, the country had 34 high-tech agricultural zones planned across 19 provinces and centrally-governed cities. The use of machinery in agriculture has increased rapidly; from 2011 to 2022, the number of tractors increased by 48%, combine harvesters by 79%, agricultural dryers by 29%, livestock feed processing machines by 90.6%, aquaculture feed processing machines by 2.2 times, and pesticide sprayers by 3.1 times. Additionally, the promotion of agricultural products on e-commerce platforms has been accelerated; by January 2022, approximately 5.2 million agricultural households had registered accounts on e-commerce platforms, with about 1.1 million accounts eligible for trading.

Key challenges in technology absorption for Vietnamese enterprises:

- Limited financial capacity: Many enterprises, especially SMEs, struggle to invest in new technologies due to high costs associated with AI, IoT, and big data, coupled with limited access to support funds, slowing down the innovation process.
- Insufficient technological workforce: There is a shortage of skilled labor in AI, blockchain, and cybersecurity, while higher salaries offered by foreign enterprises make it difficult to retain talent.
- Management mindset and corporate culture: Many leaders lack technological knowledge, are risk-averse, and lack clear digital transformation strategies, leading to slow implementation.
- Short-term and fragmented technology strategies: Enterprises invest in trends without optimizing or integrating them into their business models, resulting in resource wastage.
- Inadequate technological infrastructure: Internet, data centers, and cloud computing platforms do not meet the demands of technological development, while international cooperation is hindered by legal barriers and disparities in technological levels.
- Cybersecurity and data protection: Many enterprises lack robust security protocols and still use unlicensed software, increasing the risks of cyberattacks and data loss.

III. SOLUTIONS

Based on the global digital transformation context and the current state of technology adoption in Vietnam, it is clear that applying technology to production and business operations has become a key factor in improving operational efficiency. To fully leverage the potential of technology, specific and synchronized measures are needed as follows:

First, take advantage of government support policies. Businesses should seize and utilize policies supporting scientific and technological innovation from the government and the Ministry of Science and Technology. This helps businesses connect with technology supply and demand sources, enhancing competitiveness. During technology transfer, businesses can receive advisory support, legal guidance, and access to financial resources for technology application.

Second, apply technology software in management and production. Implementing software for accounting, production management, human resources, project management, electronic tax declaration, and social insurance helps businesses optimize processes, improve labor productivity, reduce costs, and enhance competitiveness. These technological tools not only improve operational efficiency but also contribute to the digitization of management processes, meeting the demands of the digital economy.

Third, invest in research and development (R&D). Businesses should actively invest in R&D to enhance technological capabilities and develop high-quality human resources. This is a core factor in strengthening competitiveness in the context of international economic integration. Promoting research, product innovation, and technology development will help businesses create differentiated value and seize market opportunities.

Fourth, develop an innovation ecosystem. Businesses should proactively participate in and build an innovation ecosystem that connects enterprises, universities, research institutes, and investment funds. This collaboration helps businesses easily access new technologies, leverage scientific research to develop products and services, and foster an innovative entrepreneurial spirit within the Vietnamese business community.

Fifth, participate in technology innovation support programs. Businesses should actively engage in national science and technology programs and technology supply-demand connection events to access information, transfer, and innovate technology. These programs not only provide collaboration opportunities but also help businesses expand their networks and seek strategic partners in the technology sector.

IV. CONCLUSION

In the era of rapid digital transformation, technological absorptive capacity has become a crucial driver of business performance in Vietnam. While some large corporations and FDI-backed firms have successfully integrated advanced technologies, the majority of Vietnamese enterprises—particularly SMEs—still face significant challenges in adopting and applying technology effectively. Key barriers include financial limitations, skill shortages, outdated infrastructure, and inadequate support policies, which hinder their ability to leverage digital advancements for growth and competitiveness.

To bridge this gap, businesses must adopt a proactive approach by utilizing government support, investing in research and development, applying digital solutions in management and production, and fostering collaborations within an innovation ecosystem. Enhancing absorptive capacity not only strengthens individual enterprise performance but also contributes to Vietnam's broader economic development, positioning the country as a competitive player in the global digital economy. Moving forward, a coordinated effort from businesses, policymakers, and educational institutions is essential to accelerate technological adoption and drive sustainable growth in Vietnam's dynamic business landscape.

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