



Received: 27-08-2025
Accepted: 07-10-2025

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Exploring the Barriers and Drivers of Digital Transformation in Logistics Small and Medium-Sized Enterprises in Vietnam: A Qualitative Study

¹ Nguyen Canh Thao, ² Le Khanh Thien, ³ Nguyen Thong Nhat

^{1, 2, 3} Faculty of Economics, Hanoi University of Natural Resources and Environment, Hanoi, Vietnam

Corresponding Author: **Nguyen Canh Thao**

Abstract

This study aims to explore and understand in-depth the drivers and barriers in the digital transformation process of logistics small and medium-sized enterprises (SMEs) in Vietnam, a segment that constitutes the majority but faces numerous challenges. To achieve this objective, an exploratory qualitative research method was employed, utilizing a multiple case study design with semi-structured interviews with 15 senior managers as the primary data collection tool. Thematic analysis of the results reveals that while market pressure, the need for internal performance optimization, and opportunities from e-commerce are the main drivers compelling SMEs to change, the process is profoundly hindered by core, interconnected barriers,

including financial burdens, a digital talent crisis, cultural inertia, and strategic ambiguity. Consequently, the study offers significant implications: SME managers should start with small, quick-win solutions, focus on digital culture, and consider leasing technology services, while policymakers need to develop financial support programs and specialized human resource development initiatives. The novelty of this study lies in its in-depth qualitative approach, which elucidates the "soft" and contextual factors (culture, people) often overlooked by previous quantitative studies, thereby providing a comprehensive and realistic view of the digital transformation challenges facing Vietnamese logistics SMEs.

Keywords: Digital Transformation, Logistics, Small and Medium-Sized Enterprises (SMEs), Barriers, Drivers, Qualitative Research, Vietnam

1. Introduction

The logistics service industry is considered one of the key pillars for Vietnam's economic growth, serving as the lifeblood connecting domestic production, distribution, and consumption activities with international markets. In the context of deep economic integration and the boom of e-commerce, the role of logistics has become even more critical (World Bank, 2023) ^[18]. However, logistics costs in Vietnam remain high compared to other countries in the region, posing a major challenge to national competitiveness. To address this issue, digital transformation has emerged as an inevitable trend, promising breakthroughs in operational efficiency, cost optimization, and service quality enhancement (Hofmann & Rüsch, 2017) ^[8]. Globally, the adoption of digital technologies is reshaping entire supply chains, creating sustainable competitive advantages for pioneering enterprises (Westerman *et al.*, 2014) ^[17]. In Vietnam, small and medium-sized enterprises account for over 90% of all businesses operating in the logistics sector (Vietnam Logistics Business Association, 2022) ^[16]. Despite their backbone role, this group of enterprises is the most vulnerable to the fluctuations of the technological revolution due to inherent resource limitations.

Reality shows a widening gap in technological capabilities and digital maturity between logistics SMEs and large corporations or multinational companies. While large companies can invest heavily in modern management systems and 4.0 technologies, SMEs are struggling with fundamental barriers. The delay in adapting to the digital transformation trend not only reduces their competitiveness but also poses a potential risk of logistics SMEs gradually losing market share and possibly being eliminated from an increasingly fierce market.

Although the topic of digital transformation in logistics has attracted the interest of many researchers, existing works in Vietnam mainly focus on measuring the level of technology adoption through quantitative surveys (Akbari *et al.*, 2024) ^[1] or analyzing case studies of large enterprises. Consequently, a significant research gap remains. There is a lack of in-depth qualitative studies aimed at exploring and explaining the perceptions, practical experiences, and the stories behind the digital

transformation decisions of managers at logistics SMEs. Contextual factors and "soft" aspects such as organizational culture, human capabilities, and leadership mindset, which profoundly influence the success or failure of this process (Vial, 2019), have not yet been thoroughly understood.

Therefore, the main objective of this study is to explore and deeply understand the barriers and drivers in the digital transformation process at logistics SMEs in Vietnam. To achieve this objective, the study will focus on answering two main questions:

RQ1: What are the main drivers motivating logistics SMEs in Vietnam to undertake digital transformation?

RQ2: What are the main barriers that these enterprises encounter during the digital transformation process?

The remainder of this paper is structured as follows: Section two presents a literature review on digital transformation and related analytical frameworks. Section three describes in detail the qualitative research methodology used. Section four presents the main findings drawn from the interviews. Section five will discuss these findings in relation to theory and previous research. Finally, section six provides conclusions, practical implications, and suggestions for future research.

2. Literature Review

2.1 Digital Transformation in the Logistics Industry

Digital transformation is not merely the process of digitizing documents or automating a few isolated processes. Instead, it is defined as a profound process of change in which digital technologies are used to create new business processes, cultures, and customer experiences or to modify existing ones to meet changing market and business requirements (Vial, 2021) ^[15]. In the logistics industry, digital transformation is manifested through the integration of advanced technologies into the entire supply chain, from order management, transportation, and warehousing to last-mile delivery. Key technologies include Transportation Management Systems (TMS) to optimize routes and costs, Warehouse Management Systems (WMS) to automate warehouse operations, the Internet of Things (IoT) to enable real-time tracking of assets and cargo conditions, Big Data and Artificial Intelligence (AI) for demand analysis and forecasting, and Blockchain to enhance transparency and security in traceability (Hofmann & Rüsch, 2017; Tjahjono *et al.*, 2017) ^[8, 12].

2.2 Theoretical Frameworks for Technology Adoption and Diffusion

To explain the process by which an organization decides to adopt new technology, many theoretical models have been developed. Classic models such as the Technology Acceptance Model (TAM), which focuses on perceived usefulness and ease of use (Davis, 1989) ^[5], or the Unified Theory of Acceptance and Use of Technology (UTAUT), which expands to include factors like social influence and facilitating conditions (Venkatesh *et al.*, 2003) ^[14], often focus on the individual user's perspective. However, to analyze innovation decisions at the organizational level, a more comprehensive theoretical framework is necessary.

This study uses the Technology-Organization-Environment (TOE) framework by Tornatzky & Fleischer (1990) ^[13] as its primary analytical lens. The TOE framework posits that a firm's decision to adopt a new technology is influenced by three groups of factors: (1) the Technology context, which

includes the characteristics of available and emerging technologies; (2) the Organization context, which includes internal characteristics such as firm size, structure, human resources, and corporate culture; and (3) the Environment context, which includes external factors such as industry structure, competitive pressure, and government policies. This framework is particularly suitable for this study as it allows for a systematic examination of the multi-dimensional factors, from internal to external, that influence the digital transformation process of logistics SMEs—a complex process that extends beyond individual technology acceptance.

2.3 Previous Research on Barriers and Drivers of Digital Transformation

International studies have identified a range of common drivers and barriers to digital transformation. Key drivers often include intense competitive pressure, increasing customer demands for speed and transparency, and the opportunity to improve operational efficiency to cut costs (Morakanyane *et al.*, 2017) ^[9]. Conversely, the most common barriers that enterprises, especially SMEs, face include high initial investment costs and unclear return on investment, a shortage of digitally skilled human resources, internal resistance to change, and cybersecurity concerns (Reis *et al.*, 2018; Bouwman *et al.*, 2019) ^[11, 2]. These barriers can become more severe in the context of developing economies, where technological infrastructure and support ecosystems are still limited.

2.4 The Specific Context of Logistics SMEs in Vietnam

Applying findings from international research to Vietnam requires adjustments to fit the specific context. Logistics SMEs in Vietnam, despite their overwhelming numbers, are often characterized by small capital size, limited access to credit, and heavily family-oriented management structures (Vietnam Logistics Business Association, 2022) ^[16]. These characteristics directly affect their ability to invest in technology and their willingness to take risks. Furthermore, the digital skills gap in the workforce is a major challenge, slowing down the implementation and effective utilization of new technologies. In terms of policy, the Vietnamese Government has issued the "National Digital Transformation Program to 2025, with a vision to 2030," demonstrating strong political will. However, the effectiveness of support policies in reaching SMEs remains an open question (World Bank, 2023) ^[18]. A deep understanding of how these specific factors interact to create unique drivers and barriers for Vietnamese logistics SMEs is the central focus of this research.

3. Research Methodology

3.1 Research Design

To answer the exploratory research questions of "what" and "why," this study employs an exploratory qualitative method. This approach allows for an in-depth understanding of complex phenomena in their real-life contexts, especially when the boundaries between the phenomenon and context are not clearly evident (Creswell & Poth, 2018) ^[4]. The qualitative method is suitable for capturing the diverse perspectives, experiences, and perceptions of managers, which are rich data that quantitative methods can hardly tap into.

Specifically, a multiple case study design was chosen. Compared to a single case study, analyzing multiple cases allows researchers to compare and contrast data across different contexts, thereby enhancing the reliability and generalizability of the findings (Yin, 2018) ^[19]. This design helps identify common themes and patterns emerging from multiple enterprises while still acknowledging the unique characteristics of each case.

3.2 Sampling and Interview Participants

Purposive sampling was applied to select enterprises and individuals who could provide the most insightful and relevant information for the research objectives (Palinkas *et al.*, 2015) ^[10]. Enterprises were selected based on four criteria: (1) being a small or medium-sized enterprise operating in the logistics sector; (2) having headquarters in Hanoi or Ho Chi Minh City, the two largest logistics hubs in the country; (3) having a minimum of 3 years of operation to ensure they have had certain experiences; and (4) being at some stage of the digital transformation process, from initial exploration to partial implementation.

Within each selected enterprise, interview participants were senior managers who play a decision-making role or have a direct influence on the company's technology strategy, such as CEOs, Directors, or Heads of Operations/IT. The target sample size was 15 participants, which could be adjusted until data saturation was reached, i.e., the point at which new interviews no longer provide significant new information or themes (Guest *et al.*, 2006) ^[7].

3.3 Data Collection

Primary data were collected mainly through semi-structured interviews. This method combines the flexibility of open-ended interviews with the systematic nature of a guided question set, allowing for both consistent coverage of key topics and the flexibility to ask follow-up questions based on participants' responses (Flick, 2018) ^[6]. The interviews were conducted between May 2025 and August 2025, either in person or online, depending on the convenience of the participants. Each interview lasted from 45 to 60 minutes, was audio-recorded with the participant's consent, and then transcribed verbatim for analysis.

3.4 Data Analysis

The transcribed data were analyzed using thematic analysis, following the six-step process proposed by Braun & Clarke (2006) ^[3]. This is a flexible and effective method for identifying, analyzing, and reporting patterns (themes) in qualitative data. The analysis process included the following steps: (1) familiarizing with the data by reading and re-reading the transcripts and listening to the recordings multiple times; (2) generating initial codes systematically across the entire dataset; (3) searching for potential themes by grouping related codes into thematic clusters; (4) reviewing the themes to check their coherence with the coded extracts and the entire dataset; (5) defining and naming the themes, clarifying the essence of each theme; and (6) writing the final report, presenting the analysis in a coherent and logical manner, using illustrative quotes.

4. Findings

The analysis of data from in-depth interviews with 15 managers at logistics SMEs has highlighted a set of core themes. These themes are categorized into two main groups:

the key drivers promoting digital transformation and the main barriers hindering it.

4.1 Key Drivers of Digital Transformation

Theme 1: Pressure from the Market and Customers

The most powerful and commonly mentioned driver was direct pressure from the competitive environment and increasingly stringent customer demands. Most interviewees agreed that adopting technology is no longer an option for creating an advantage but has become a minimum requirement for survival in the market. Customers, especially large enterprises and international partners, are demanding higher levels of transparency, speed, and real-time order tracking capabilities. A director of a company in Ho Chi Minh City shared: *"Customers now demand real-time order tracking; if we don't have it, they'll just choose someone else. It's no longer a competitive advantage, but a minimum requirement for survival."*

This pressure also comes from the rise of new competitors, especially technology startups (logtech) with their agility and strong digital foundations. An operations manager in Hanoi stated: *"The new companies are all using apps now, their processes are automated, and their prices are more competitive. If we keep doing things manually, how can we compete? We have to change, or we'll lose customers."*

Theme 2: Optimization of Internal Performance

Facing external pressures, enterprises recognize digital transformation as the inevitable path to optimizing internal operational performance and reducing operating costs. This need stems from the desire to solve inherent problems in manual processes, such as human error, resource waste, and slow processing times. An executive director emphasized: *"The main goal is to reduce paperwork, reduce employee errors, and optimize routes to save on fuel. Saving a little on each thing adds up to a very large number."* The digitization of processes is expected to help standardize operations, minimize reliance on individual experience, and enhance management's ability to supervise and monitor.

Theme 3: Seizing Opportunities from E-commerce

Besides defensive pressures, the e-commerce boom is seen as an offensive driver, opening up breakthrough growth opportunities for logistics enterprises. The surge in small-parcel orders, coupled with the demand for fast delivery, has created a new playground that traditional management methods cannot handle. An interviewee whose company specializes in last-mile delivery explained: *"With the e-commerce boom, the volume of orders has increased dramatically. Without management technology, it would be impossible to handle. The system helps us assign orders, optimize delivery routes, and manage shippers much more effectively."* This is seen as a golden opportunity for SMEs to scale up and capture market share if they can adapt quickly in terms of technology.

4.2 Key Barriers to Digital Transformation

Theme 4: Financial Burden

The most frequently mentioned and considered the biggest obstacle is the financial burden. The initial investment costs for hardware, software, and implementation consulting are enormous for SMEs with limited capital. A company director lamented: *"A good WMS system costs billions of dong, where do we get the capital? Meanwhile, we still have*

to worry about paying salaries and renting space." Furthermore, the financial burden does not stop at the initial cost. Another manager pointed out: *"The annual maintenance and upgrade costs are also a big issue. Technology changes constantly; if we don't upgrade, we become obsolete, but that cost is not small."*

Theme 5: Digital Talent Crisis

Even if the financial problem can be solved, enterprises face a crisis of personnel with digital skills. Finding personnel who are knowledgeable in both logistics and technology is an extremely big challenge. A human resources manager said: *"Recruiting someone who knows both logistics and is proficient in technology is like finding a needle in a haystack. The market is very scarce."* This problem is further complicated by two aspects: the unwillingness of the current staff and the high cost of hiring new talent. One participant shared their experience: *"The old employees don't want to learn new things; they are used to working the old way. As for hiring new employees with skills, they demand very high salaries, which SMEs like us cannot afford."*

Theme 6: Cultural Inertia and Fear of Change

An invisible but profoundly influential barrier is the inertia of organizational culture and the psychological resistance to change. In many enterprises, especially those with a family-owned structure, decisions often depend on older leaders who tend to trust experience and traditional relationships more than technology. A young director shared: *"The older bosses are used to the old way of working, relying on relationships. They don't see the need to invest a large sum of money in something they don't fully understand."* Resistance comes not only from the leadership but also from the employees themselves, who fear that technology will take their jobs. A warehouse manager recounted: *"When we planned to install a barcode scanning system, many warehouse workers were afraid that technology would replace them, so they didn't cooperate, and even deliberately made procedural errors to prove the system was ineffective."*

Theme 7: Strategic Ambiguity

Finally, even with motivation and will, many managers admit to ambiguity in developing a proper digital transformation roadmap. They often do not know where to start, which technologies to prioritize, and how to effectively integrate technology solutions into existing processes. A director admitted: *"We know we have to digitally transform, but where to start, what to do first, is very vague. There are so many solutions on the market, we don't know which one is really right for us."* This ambiguity leads to a trend of investing based on fads, lacking synchronization and a long-term strategy. Another participant concluded: *"It's mostly following trends; we do what we see others doing without a proper roadmap. The result is disparate software that can't connect with each other, causing waste."*

5. Discussion

The research findings not only reflect the common challenges and drivers in digital transformation but also reveal the specific nuances of the context of logistics SMEs in Vietnam. The drivers from market pressure and

opportunities from e-commerce show that Vietnamese SMEs are not standing outside the mainstream of the digital economy but are being drawn into a race for survival. However, their response is strongly governed by internal barriers.

The financial barrier, although a global issue, becomes more severe in Vietnam due to the specifics of the financial ecosystem. For SMEs, it is not just about high investment costs but also the very limited access to preferential loan capital, making technology investment decisions riskier. Similarly, the barrier of organizational culture and resistance to change is closely linked to the prevalent family-owned business structure in Vietnam. The conflict between the older generation's management thinking based on experience and relationships and the younger generation's approach based on data and processes creates an invisible but incredibly powerful force of resistance. The strategic ambiguity also reflects the lack of professional consulting firms and successful role models for SMEs to learn from.

The findings of this study are fully compatible with and provide empirical evidence for the Technology-Organization-Environment (TOE) framework. Specifically, drivers such as "competitive pressure" and "customer demands" are clear manifestations of the Environment context. Meanwhile, barriers such as "financial burden," "talent crisis," "cultural inertia," and "strategic ambiguity" all belong to the Organization context. The high cost and complexity of technology, latent in the financial and strategic barriers, reflect the Technology context.

Compared to international studies, these findings have many similarities. For instance, cost and lack of skills are two of the top barriers recorded in developed countries as well (Reis et al., 2018) [11]. However, this study indicates that the degree and nature of some barriers in Vietnam are different. In particular, the factors of "digital talent crisis" and "cultural inertia" seem to be more prominent and have a more profound impact than in the context of developed countries, which have more mature labor markets and corporate governance cultures. This suggests that the "soft" factors related to people and organization are the most critical bottlenecks in the digital transformation process of Vietnamese logistics SMEs.

Theoretically, this study contributes to enriching the TOE framework by applying and validating it in the specific context of a service industry in a developing economy. It shows that the components of the TOE framework are not static but are strongly shaped by local socio-economic factors. Furthermore, the study emphasizes the importance of contextual factors in shaping the digital transformation process in SMEs. It indicates that focusing solely on technological factors while ignoring organizational and environmental aspects, especially variables such as family business structure or the quality of the national education system, will lead to an incomplete perspective on the challenges that businesses face.

6. Conclusion and Implications

This study has discovered that the digital transformation process at logistics SMEs in Vietnam is a complex process, driven by strong motivations from market pressure, the need for internal performance optimization, and opportunities from e-commerce. However, this process is simultaneously hindered by core, interconnected barriers, including

financial burdens, a digital talent crisis, organizational cultural inertia, and strategic ambiguity.

From these results, the study proposes several practical implications. For SME managers, instead of pursuing large-scale projects, they should start with small, quick-win solutions to build momentum; at the same time, they need to focus on internal training and building a digital culture, and consider leasing technology services (SaaS) to reduce capital pressure. For policymakers, it is necessary to build specific financial support packages and tax incentives for SMEs investing in technology; promote collaboration between businesses and educational institutions to solve the human resource problem; and organize awareness-raising programs to connect technology supply and demand.

This study has some limitations, including a small sample size and a geographical focus on only Hanoi and Ho Chi Minh City, which limits the generalizability of the results to all of Vietnam. Additionally, this is a cross-sectional study at a single point in time. Therefore, future research could conduct a large-scale quantitative survey to test these findings. A longitudinal study would be useful to track the changes in barriers and drivers over time, and a comparative study between different types of logistics SMEs (e.g., freight forwarding, warehousing, transportation) is also a potential direction.

7. References

1. Akbari M, Kok SK, Hopkins J, Frederico GF, Nguyen H, Alonso AD. The changing landscape of digital transformation in supply chains: Impacts of industry 4.0 in Vietnam. *The International Journal of Logistics Management*. 2024; 35(4):1040-1072.
2. Bouwman H, Nikou S, De Reuver M. Digitalization, business models, and SMEs: How do business model innovation practices mediate in the relationship between digitalization and performance? *Telecommunications Policy*. 2019; 43(8):101828.
3. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006; 3(2):77-101.
4. Creswell JW, Poth CN. *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage Publications, 2018.
5. Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*. 1989; 13(3):319-340.
6. Flick U. *An introduction to qualitative research* (6th ed.). Sage Publications, 2018.
7. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field Methods*. 2006; 18(1):59-82.
8. Hofmann E, Rüscher M. Industry 4.0 and the current status as well as future prospects on logistics. *Computers in Industry*. 2017; 89:23-34.
9. Morakanyane R, Grace AA, O'Reilly P. Conceptualizing digital transformation in business organizations: A systematic review of literature. In *Proceedings of the 30th Bled eConference: Digital Transformation - From Connecting Things to Transforming Our Lives*, 2017.
10. Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*. 2015; 42(5):533-544.
11. Reis J, Amorim M, Melão N, Matos P. Digital transformation: A literature review and guidelines for future research. In *Trends and advances in information systems and technologies*. Springer, 2018, 411-421.
12. Tjahjono B, Esplugues C, Ares E, Pelaez G. What does industry 4.0 mean to supply chain? *Procedia Manufacturing*. 2017; 13:1175-1182.
13. Tornatzky LG, Fleischer M. *The processes of technological innovation*. Lexington Books, 1990.
14. Venkatesh V, Morris MG, Davis GB, Davis FD. User acceptance of information technology: Toward a unified view. *MIS Quarterly*. 2003; 27(3):425-478.
15. Vial G. Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*. 2021; 28(2):118-144.
16. Vietnam Logistics Business Association. *Vietnam Logistics Report 2022*. Ministry of Industry and Trade, 2022.
17. Westerman G, Bonnet D, McAfee A. *Leading digital: Turning technology into business transformation*. Harvard Business Review Press, 2014.
18. World Bank. *Logistics Performance Index 2023: Connecting to Compete*. The World Bank, 2023.
19. Yin RK. *Case study research and applications: Design and methods* (6th ed.). Sage Publications, 2018.