

THE ROLE OF DIGITAL TRANSFORMATION IN ENHANCING THE COMPETITIVENESS OF RURAL INDUSTRIAL ENTERPRISES IN VIETNAM

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ABSTRACT

In the context of the Fourth Industrial Revolution, digital transformation has become an important driving force for enhancing enterprise competitiveness, particularly among rural industrial enterprises, which are generally characterized by small scale, limited technological capacity, and weak market access. This paper analyzes the role of digital transformation in improving the competitiveness of rural industrial enterprises in Vietnam. It clarifies the role of digital transformation in enhancing production efficiency, expanding markets, improving corporate governance, and strengthening innovation capacity. The analysis also identifies several challenges, including limited financial resources, inadequate digital skills, and underdeveloped technological infrastructure. On this basis, the study proposes several policy implications to promote digital transformation in the rural industrial sector.

Keywords: enterprises, competitiveness, digital transformation, rural industry, Vietnam.

In recent years, digital transformation has become an inevitable trend in global economic development. In Vietnam, the Government has issued a number of important policies to promote digital transformation, notably Decision No. 749/QĐ-TTg in 2020 on the National Digital Transformation Program (Chinh phu, 2020). Accordingly, enterprises are identified as the center of the digital transformation process and play a key role in enhancing national competitiveness. The rural industrial sector in Vietnam plays an important role in local economic development, job creation, and economic restructuring. According to the Ministry of Industry and Trade (2025), the country has more than 2,000 industrial clusters and tens of thousands of rural industrial production establishments, most of

which are small and medium-sized enterprises (SMEs). However, this sector still faces many limitations, such as outdated technology, low productivity, and weak participation in global value chains. In this context, digital transformation is expected to serve as a breakthrough solution to help rural industrial enterprises improve their competitiveness. According to the World Bank (2021), the application of digital technologies can help enterprises increase productivity by 20–30% while significantly reducing operating costs. Nevertheless, the level of digital transformation adoption among rural industrial enterprises in Vietnam remains relatively limited, with only about 20–30% of SMEs applying digital technologies at a basic level.

1. THEORETICAL FOUNDATION

1.1. The concept and nature of digital transformation in enterprises

In recent years, the concept of digital transformation has been approached from various perspectives in academic research. According to Gregory Vial (2019), digital

transformation is understood as a process in which organizations use digital technologies to create profound changes in business models, organizational structures, and value creation methods. Unlike digitization, which merely converts data from physical to digital form, or the digitalization of processes,

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which improves processes through technology, digital transformation is more strategic and comprehensive in nature.

From the perspective of strategic management, digital transformation is not merely a technological tool but also a process of enterprise restructuring aimed at adapting to a new competitive environment. According to Erik Brynjolfsson and Andrew McAfee (2014), enterprises that effectively apply digital technologies are able to create a “*digital advantage*” enabling them to outperform competitors in terms of productivity and innovation. For rural industrial enterprises in particular, digital transformation is significant in narrowing the technological gap between rural and urban areas. Technologies such as cloud computing, e-commerce, and big data enable small-scale enterprises to access resources that were previously available only to large enterprises (World Bank, 2021).

1.2. Theories of enterprise competitiveness and competitive advantage

The concept of enterprise competitiveness has been developed from various theoretical schools. According to Michael E. Porter (1985), a firm’s competitive advantage derives from its ability to perform activities in the value chain at a lower cost or to create differentiation compared with its competitors. Porter’s value chain model emphasizes the role of activities such as production, marketing, and services in value creation. However, in the context of the knowledge economy, the resource-based view has expanded this concept. According to Jay Barney (1991), a firm’s sustainable competitive advantage depends on its possession and effective exploitation of resources that are valuable, rare, difficult to imitate, and difficult to substitute. In the context of digital transformation, resources

such as data, technological capabilities, and digital skills have become core factors. In addition, David J. Teece’s dynamic capabilities theory (2007) emphasizes the ability of enterprises to integrate, build, and reconfigure resources in order to adapt to rapidly changing environments. Digital transformation is a specific manifestation of dynamic capabilities, as enterprises must continuously adjust their strategies and operating models to take advantage of new technologies.

1.3. Mechanisms through which digital transformation affects competitiveness

Based on the above theoretical synthesis, the impact mechanism of digital transformation on the competitiveness of rural industrial enterprises can be analyzed through four main channels.

First, digital transformation improves operational efficiency. It enables the automation of production and management processes, thereby reducing costs and increasing productivity. This is consistent with Porter’s theory of cost advantage.

Second, digital transformation expands markets and improves customer access. Digital platforms such as e-commerce help rural industrial enterprises overcome geographical limitations and reach customers on a wider scale. This is an important factor in increasing revenue and strengthening competitive position.

Third, digital transformation improves managerial capacity. Digital management systems, such as ERP and CRM, help enterprises improve decision-making quality, enhance information transparency, and optimize resources. This is directly related to enterprises’ dynamic capabilities.

Fourth, digital transformation promotes innovation. Digital technologies create favorable conditions for enterprises to

develop new products, improve processes, and personalize services. This is a core factor

2. RESEARCH METHODOLOGY

In this paper, the author adopts a qualitative approach based on the analysis of secondary data to clarify the role of digital transformation in enhancing the competitiveness of rural industrial enterprises in Vietnam. This approach is selected because the study is primarily synthetic in nature, aiming to explain impact mechanisms and assess development trends rather than to test quantitative hypotheses. According to Creswell (2014), qualitative research is particularly appropriate in cases where it is necessary to explore a phenomenon within a complex practical

3. ANALYSIS OF THE CURRENT STATE OF DIGITAL TRANSFORMATION IN RURAL INDUSTRIAL ENTERPRISES IN VIETNAM

Table 3.1 indicates that most enterprises remain at the stage of adopting basic digital technologies such as Internet connectivity and email communication, while more strategic technologies, including Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), and Artificial Intelligence (AI), have not yet been

in creating sustainable competitive advantage according to the resource-based view.

context, especially when quantitative data are limited or incomplete. In the Vietnamese context, data collection on digital transformation in the rural industrial sector remains fragmented; therefore, the use of secondary data from various sources is a reasonable choice. The author applies an interpretive analytical approach combined with inductive reasoning, using multiple data sources from the General Statistics Office, the Ministry of Industry and Trade, the World Bank, the OECD, and UNIDO to conduct comparative and trend analyses, thereby drawing conclusions about the role and impact mechanisms of digital transformation. widely implemented. This situation clearly reflects the phenomenon of “surface-level digital transformation,” in which enterprises digitize certain activities without fundamentally transforming their business models. The level of technology adoption among rural industrial enterprises is even lower due to constraints related to financial resources and human capital. Consequently, a significant competitiveness gap exists between rural enterprises and their urban counterparts.

Table 3.1. Level of digital technology adoption in Vietnamese enterprises

Content of Digital Technology Application	Percentage of Enterprises (%)
Internet usage	72
Use of email for business communication	68
Use of accounting software	54
Use of e-commerce platforms	32
Use of ERP/CRM systems	18
Application of AI/Big Data	5

Source: Compiled by the author from MPI and World Bank data.

3.1. The Impact of Digital Transformation on Operational Efficiency

It can be seen that digital transformation has had and continues to have a clear impact

on the production efficiency and operational performance of enterprises.

Table 3.2. The Impact of Digital Transformation on Operational Efficiency

Indicator	Non-Digitally Transformed Enterprises	Digitally Transformed Enterprises
Labor productivity growth (%)	5–10	20–30
Reduction in operating costs (%)	3–5	15–20
Production defect rate (%)	8–10	3–5
Order processing time (days)	5–7	2–3

Source: World Bank (2021); OECD (2020).

Enterprises that have adopted digital transformation demonstrate significantly superior operational performance compared to those that have not. Specifically, labor productivity is reported to be two to three times higher, while operating costs are substantially reduced. Notably, order processing time has been shortened from approximately 5 - 7 days to only 2 - 3 days, highlighting the crucial role of digital technologies in optimizing production processes and logistics operations. These findings are fully consistent with Porter's

(1985) theory of cost advantage, which argues that technological innovation enables firms to achieve superior efficiency and sustainable competitive advantages.

3.2. The Impact of Digital Transformation on Market Expansion

In the current period, as Vietnam seeks to accelerate economic growth and enhance its global integration, one of the most significant benefits of digital transformation is its ability to expand market access through digital platforms.

Table 3.3. Percentage of Enterprises Participating in Online Markets

Business Model	Percentage of Enterprises (%)
Traditional sales only	58
Combination of online and offline sales	30
Primarily online sales	12

Source: Ministry of Industry and Trade (2023).

The data indicate that although the majority of enterprises still rely on traditional sales channels, the trend toward integrating online and offline business models is increasing. Approximately 42% of enterprises have already participated in the digital marketplace, demonstrating that digital transformation is gradually reshaping market access strategies. For rural industrial enterprises, participation in e-commerce platforms helps overcome geographical constraints, particularly in accessing international markets. Currently, many enterprises and household businesses in rural areas have begun conducting transactions

through e-commerce platforms, while traditional craft products are increasingly marketed and sold via platforms such as Shopee, Lazada, and Amazon. This development enables rural enterprises to reach broader customer segments, improve brand visibility, and enhance their competitive position in both domestic and international markets.

3.3. The Impact of Digital Transformation on Enterprise Management Capability

The results indicate that more than 60% of enterprises reported improvements in financial management and decision-making

after adopting digital technologies. This finding demonstrates that digital transformation plays a significant role in enhancing the quality of corporate governance. In particular, the use of real-time

data enables enterprises to make faster and more accurate decisions, thereby improving their ability to adapt to market changes - a core element of the dynamic capabilities theory proposed by Teece (2007).

Table 3.4. *Improvement in Management Performance Following Digital Transformation*

Management Aspect	Percentage of Enterprises Reporting Improvement (%)
Financial Management	65
Customer Relationship Management (CRM)	58
Decision-Making	62
Information Transparency	60

Source: Compiled and calculated by the author

3.4. The Impact on Innovation Capacity

Table 3.5 demonstrates that digital transformation has a significant impact on innovation activities, particularly in product improvement and production process innovation. This finding reflects the role of digital technologies in enhancing innovative

capacity, which is a critical factor in creating sustainable competitive advantage. However, the proportion of enterprises developing entirely new products remains relatively low (35%), suggesting that innovation within the rural industrial sector is still predominantly incremental rather than radical in nature.

Table 3.5. *Innovation Activities in Digitally Transformed Enterprises*

Innovation Activity	Percentage of Enterprises (%)
Product improvement	48
Production process innovation	52
Development of new products	35
Product/service personalization	28

Source: Compiled and calculated by the author.

3.5. Barriers to Digital Transformation

Despite the numerous benefits generated by digital transformation, its implementation continues to face several significant barriers.

The findings indicate that the most significant barrier is the shortage of human resources with digital skills (72%), followed by financial constraints (68%). These results suggest that digital transformation is not

merely a technological issue but also a challenge related to human capital and resource availability. For the rural industrial sector, these barriers are even more pronounced due to relatively limited socio-economic conditions. This helps explain why the level of digital transformation adoption in this sector remains relatively low.

Table 3.6. *Major Barriers Faced by Enterprises*

Barrier	Percentage of Enterprises (%)
Lack of financial resources	68

Shortage of digitally skilled human resources	72
Insufficient technological infrastructure	55
Lack of awareness and understanding	50

Source: Compiled and calculated by the author.

4. MANAGERIAL AND POLICY IMPLICATIONS

The study demonstrates that digital transformation plays a crucial role in enhancing the competitiveness of rural industrial enterprises in Vietnam through four primary mechanisms: (i) improving operational efficiency, (ii) expanding market access, (iii) strengthening managerial capabilities, and (iv) promoting innovation. These findings are not only consistent with the proposed analytical framework but also reinforce existing theoretical foundations.

First, the findings confirm that digital transformation represents a new form of strategic resource from the perspective of the Resource-Based View (RBV). Elements such as data, digital platforms, and technological capabilities can be considered valuable and difficult-to-imitate resources, thereby contributing to the creation of sustainable competitive advantages (Barney, 1991). Given the limitations in capital and scale typically faced by rural industrial enterprises, digital transformation serves as a strategic lever that enables firms to overcome traditional constraints.

Furthermore, the study supports the dynamic capabilities perspective by showing that enterprises adopting digital technologies are better able to adapt to changing business environments. The reduction in order processing time, improvements in decision-making quality, and enhanced market responsiveness provide clear evidence of

firms' ability to reconfigure resources in a digital environment (Teece, 2007).

Although digital transformation generates substantial benefits, the study also reveals that financial constraints, shortages of skilled labor, and inadequate infrastructure remain significant obstacles. These findings suggest that digital transformation is not solely an internal business issue but also depends heavily on the broader institutional ecosystem. This highlights the importance of integrating an ecosystem approach into digital transformation research. Enterprise competitiveness depends not only on internal resources but also on external factors such as public policies, infrastructure, and support networks.

Moreover, the findings reveal the existence of a "digital divide" between rural and urban enterprises. This raises important concerns regarding the inclusiveness of digital transformation and underscores the need for policy interventions aimed at reducing digital inequalities.

4.1. Recommendations for Government and Policymakers

To further strengthen the role of digital transformation in enhancing the competitiveness of enterprises in general and rural industrial enterprises in particular, several policy recommendations are proposed.

First, a comprehensive digital transformation ecosystem should be developed for rural areas. This includes investing in digital infrastructure,

particularly high-speed internet connectivity and shared technology platforms designed for small and medium-sized enterprises.

Second, specialized financial support policies should be established to assist rural industrial enterprises throughout the digital transformation process. These may include tax incentives, preferential credit programs, and technology innovation support funds.

Third, digital skills training programs for the rural workforce should be expanded and strengthened. Human capital development is a critical factor in ensuring the successful adoption and operation of digital technologies.

Fourth, stronger collaboration should be promoted among enterprises, research institutions, and technology firms in order to build an innovation ecosystem that generates broader spillover effects.

4.2. Recommendations for Enterprises

5. CONCLUSION, LIMITATIONS, AND FUTURE RESEARCH DIRECTIONS

In the context of digital transformation becoming an inevitable trend in the global economy, this study has examined the role of digital transformation in enhancing the competitiveness of rural industrial enterprises in Vietnam. The findings indicate that digital transformation has a positive and multidimensional impact on enterprise competitiveness through four primary mechanisms: (i) improving operational efficiency, (ii) expanding market access, (iii) strengthening managerial capabilities, and (iv) fostering innovation. These findings are consistent with the proposed analytical framework and further reinforce major theoretical perspectives, including the Resource-Based View (RBV), Dynamic

To further improve their competitiveness, rural industrial enterprises should focus on the following strategic actions.

First, enterprises should recognize that digital transformation is not merely a technological investment but rather a long-term development strategy closely linked to business model transformation.

Second, enterprises should prioritize digital solutions that align with their scale and available resources, beginning with fundamental applications such as financial management systems, online sales platforms, and customer relationship management tools.

Third, firms should invest in strengthening internal capabilities, particularly employees' digital skills and organizational data management capabilities.

Fourth, enterprises should enhance collaboration with digital platforms and technology partners to leverage external resources and reduce initial investment costs. Capabilities Theory, and Competitive Advantage Theory.

The study also reveals that the level of digital transformation within Vietnam's rural industrial sector remains relatively limited and uneven. Major barriers include insufficient financial resources, inadequate digital skills, underdeveloped technological infrastructure, and limited awareness of the benefits associated with digital transformation.

Despite its contributions, the study has several limitations. First, it primarily relies on secondary data sources and therefore may not fully capture the micro-level characteristics of individual enterprises. Second, no quantitative analysis was conducted to empirically test the magnitude of relationships among variables in the proposed framework. Third, the study focuses exclusively on Vietnam, limiting the

generalizability of its findings to other national contexts.

Future research may pursue several directions. First, quantitative methods such as Structural Equation Modeling (SEM) and Partial Least Squares Structural Equation Modeling (PLS-SEM) could be employed to empirically validate the relationships proposed in the conceptual framework. Second, the scope of analysis could be

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expanded to include other developing countries for comparative purposes. Third, future studies may further investigate the moderating roles of public policy, organizational culture, and institutional environments. Finally, more in-depth research could focus on specific rural industrial sectors such as traditional craft villages, mechanical engineering enterprises, and agro-processing industries.

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