Impact Of Supply Chain Digitization on Enterprise Digital Transformation: Case Analysis and Strategies

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Abstract. This study examines the role of digital technologies in driving digital transformation in enterprises. As the economy and society enter a new era characterized by digital as a central feature, more and more companies are embarking on digital transformation, and more and more processes in the supply chain are applying digital technologies. However, while literature on the economic consequences of digital transformation has begun to emerge, the existing literature has received less attention than research on the factors influencing firms' digital transformation. The existing literature still needs to be improved and requires further in-depth research in past studies, especially in discussing supply chain relationships and firms' digital transformation. This study suggests a theory of dynamic capabilities to improve the digital transformation of businesses by integrating and analyzing internal and external factors in the digital transformation of businesses, as well as a case study on the dual impact of supply chain digitization on the digital transformation of businesses. It talks about studies on digital transformation that focus on MSMEs as their target market and offers recommendations for further research on the improvement and management of external interactions. By examining how the supply chain affects the digital transformation of enterprises, this paper suggests new perspectives and research scopes for exploring how to improve the success rate of enterprise transformation and help to better contribute to the academic community.

Keywords: Supply chain digitization; Enterprise digital transformation; Dynamic capabilities theory; Small and medium-sized enterprises (SMEs).

1. Introduction

Under the torrent of a new technological revolution, the human economy and society have entered a new era with digital technology, such as artificial intelligence, blockchain, cloud computing, big data, and other technologies, as the core feature [1]. To stand out in the new trend, an increasing number of enterprises are embarking on digital transformation, and more processes included in the supply chain also apply digital techniques. On the other hand, the economic consequences of digital transformation are being discussed in relevant literature as the transformation progresses [1]. The current literature on the influence factors of enterprise digital transformation is being neglected, compared to the extensive research on the economic consequences of digital transformation [1]. Among them, in recent years, the discussion on the digital synergy effect among the supply chain relationship network has clarified that information communication, resource interaction and cooperation between the upstream and downstream are the necessary conditions to achieve the goal of digital transformation. However, it is not difficult to find that the existing literature still needs to be improved in discussing supply chain relationships and enterprise digital transformation, which needs further in-depth research [1].

2. Case Analysis

2.1. Integrating Internal and External Factors for Enterprise Digital Transformation

Nowadays, enterprise digital transformation is regarded as the crux for enterprises' future success. Digital transformation has been shown to promote business innovation, enhance customer experiences, and improve performance, as evidenced by research [2]. But when faced with environmental change, a lot of businesses either fail or refuse to change, creating a paradox wherein

changing is akin to desiring death and not changing is like to waiting for death. Many enterprises are likely to assume that the digital transformation is to let the new technology in and use the technology to participate in the internal resource arrangement. However, the complexity and difficulty of the structure and relationships between multiple research areas in digital transformation makes it difficult to understand the issues involved. When enterprises try to use the business analysis tool of SWOT to support them in making wiser decisions, the author thinks that a similar idea can be applied in analyzing digital transformation.Digital transformation requires both resource orchestration and environmental unpredictability in order to provide sustainable development and increased competitiveness. If the consistency coefficient is above 0.9, the antecedent condition will generally be considered necessary according to research on necessity analysis of single conditions. [2]. Despite this, the outcome suggests that digital transformation doesn't necessitate any one condition,referencing Table 1 [2].

Table 1. Digital Maturity and Condition Comparison

prerequisite	High level of digital maturity		Non-high level of digital maturity	
	Consistency	Coverage	Consistency	Coverage
Technical uncertainty	0.773	0.714	0.694	0.588
~Technical uncertainty	0.554	0.664	0.663	0.728
Market uncertainty	0.796	0.712	0.681	0.559
~Market uncertainty	0.508	0.635	0.650	0.745
Resource structuring	0.725	0.716	0.648	0.586
~Resource structuring	0.581	0.643	0.686	0.696
Resource bundling	0.711	0.730	0.663	0.624
~Resource bundling	0.634	0.672	0.713	0.693
Resource leveraging	0.752	0.651	0.737	0.586
~Resource leveraging	0.521	0.684	0.560	0.674

Therefore, the enterprise digital transformation is not simply to focus on the internal adjustment; in contrast, they should combine the external and internal circumstances to find the relationship between every influencing factor and then, according to the dynamic capability theory, make comprehensive adjustments to gain the competitive advantages.

2.2. The Dual Impact of Supply Chain Digitization on Enterprise Digital Transformation

Supply chains (SCs) are more important in today's competitive environment than enterprises. Effective supply chain activities are being aided by the increased focus on digital supply chain (DSC) [3]. Supply chain digitization aims to make the information of each link of the supply chain can be shared and managed through the information system, improve production and logistics efficiency through the automation of business processes and with the participation of digitization, the service scope of the original supply chain can be expanded.

The benefits of supply chain digitization for the digital transformation of enterprises are not limited to one point. In terms of future development, the application of digital technology makes data mining and analysis easier, which allows enterprises to see more possibilities and provides a way to identify business opportunities in advance. Through real-time data access and analytics, digitization will create value and capture opportunities [4]. In terms of efficiency, when the supply chain is automated, those parts of the process that would otherwise require manpower may be automatically replaced, and the utilization rate of resources is also improved, reducing the waste of resources. In the study,effective control and planning can be achieved by reducing costs and achieving environmental sustainability with the application of digital technologies that produce data inputs [4]. In terms of organizational management, digitization not only represents the application of new technology but also reflects the cutting-edge wave when the supply chain structure is more reasonable. The division

of labor is more detailed, the business model and organizational structure of the entire enterprise will be more advanced, adapt to the trend of The Times more quickly, and play a better role.

Although supply chain digitization positively influences enterprise digital transformation, it could also negatively impact an enterprise's digital transformation. The safety of employees and consumers is threatened by supply chain safety issues, and enterprises in the supply chain are impeded from developing sustainably, particularly small- and medium-sized enterprises (SMEs) [5]. Suppose the security of supply chain digitization cannot be handled well. In that case, applying digital technology will not only fail to bring opportunities for enterprises. Still, it will lead to the disclosure of confidential information about the company, which will affect the overall operation and reputation of the enterprise. Also, the author thinks that in supply chain management, the more important points are data visualization and the control tower. Data visualization and the control tower are different. Data visualization can be relatively easier to achieve, while constructing a controlling tower to integrate all the parts for monitoring is quite difficult. The main aim of supply chain management (SCM) is to improve overall supply chain performance, which means integration is crucial [6]. Therefore, not only does forming a good controlling tower cost lots of resources, but with a low-quality controlling system, enterprises are getting stuck halfway through the digital transformation without any solution.

2.3. Leveraging Supply Chain for External Relations in Enterprise Digitalization

The environmental problems not only put stress on human health but also influence many aspects of human production and life. Therefore, researchers need to consider balancing production and the environment. To achieve sustainability objectives, including social, economic, and environmental aspects,digital technologies should better to be incorporated in the management. So, applied in the supply chain, maybe through digitization, the supply chain process can become more sustainable. Methods such as remanufacturing, recycling, recovering, reusing, rethinking, and reducing can be developed and adopted through the sustainability approach [7]. So, this sustainability will truly influence every aspect of the supply chain process.By applying a sustainable manufacturing process, costs can be reduced, resource utilization can be optimized, brand reputation and regulatory compliance can be improved, market access can be increased, and competitive advantage can be gained [7]. This means that the sustainable supply chain will positively impact the whole enterprise. At the same time,the environmental benefits of technological advancements are the focus of green innovation [8]. So, in detail, supply chain digitization will also promote the development of green innovation for enterprises in the path of digital transformation.

The existing literature mainly focuses on government regulation measures and enterprises [1]. Characteristics are the study's starting point, and the important factor of social relations needs to be paid more attention to [1]. In supply chain management, interpersonal and social relationships are very important. Social relationships are based on mutual consent between groups of people in the supply chain; the link between people could be suppliers, manufacturers, manufacturers, and customers when using the net map method, originally developed to map multiple [9].

To explore the supply chain, social relationships can be examined for various reasons. It could be concluded that building trust with good communication, a win-win relationship, and burdening social responsibility together to strengthen the social relationship in the supply chain can boost supply chain efficiency and improve risk management [10]. Supply chain actors can collaborate and coordinate to effectively respond to various shifts in the industry. These processes not only offer valuable insights and financial resources but are also enhanced by social networks intertwined with supply chains. Therefore, with a good social relationship, the supply chain can positively influence the enterprise's digital transformation.

3. Suggestions

3.1. Enhancing Enterprise Digital Transformation through Dynamic Capabilities Theory

Derived from the resource-based view (RBV), which centers on developing sustainable competitive advantage in unchanging settings, the DCV concentrates on addressing the challenges of competitive survival and strategic progression in rapidly evolving environments [11]. The DCV considers involvement in business relationships, strategic alliances, and networks as a viable avenue for a firm to attain a competitive edge, building on the foundation established by the RBV [11]. Applying the enterprise dynamic theory in the context of enterprise digital transformation gives the researchers a brand-new viewpoint to research how to lead enterprises to digital transformation or how to achieve digital transformation better. As per Teece's perspective, dynamic capabilities can be categorized into three different sets of activities: the ability to identify and adapt to opportunities and challenges (sensing), to capitalize on opportunities (seizing), and to sustain competitiveness through enhancing, blending, safeguarding, and as and when required, restructuring the enterprise's intangible and physical resources (reconfiguring) [11]. So, according to the explanation, when seeking ways to help enterprises better achieve digital transformation, researchers can think about innovating the business mode to be more responsive to the market and customer needs. At the same time, the relationships between suppliers, customers, and other stakeholders should also be considered in detail. Strategic innovation and long-term performance in a firm are dependent on its orchestration capabilities. Therefore, the possibility of reconstructing costs and the potential benefits of mismatch should also be considered.

3.2. An investigation into how digital transformation affects small and medium enterprises

Small and medium enterprises (SMEs) have borne the brunt of the COVID-19 pandemic, as it has caused a marked decline in people's buying capacity along with the shuttering of businesses due to production constraints and physical distancing requirements.The significance of micro, small, and medium-sized enterprises in the development of the national economy and society cannot be overstated.Therefore, researchers must take micro, small and medium-sized enterprises as research objects to study the impact of supply chain digitization on enterprise digitization in this field. Based on the research that is currently available, the impact of e-payment and e-commerce on the performance of MSME supply chains has already been assessed. Furthermore, viable solutions and open innovations have been proposed to expedite the process of digitalizing MSMEs [12].

Although the above research has already shown the positive impact of the digitization of the supply chain on the MSME’s digital transformation, there is a negative impact, and the researchers can also deepen the positive side more specifically. To study how supply chain digitization affects digital transformation of enterprises, researchers can concentrate on micro, small, and medium-sized enterprises.

3.3. Further Research Needed on Managing and Enhancing External Relations

As mentioned in the text, when the supply chain exists in a good external environment, it will positively impact the enterprise’s digital transformation. However, knowing that a good result will be produced is far from enough; researchers need more research on improving this external relationship and improving enterprises’ adaptation to the changing environment. According to the existing research, the concept of circular economy is popular. CE advancement places significant emphasis on sustainable, eco-friendly, and socially responsible public procurement practices. One of the key areas of focus in this initiative is the development of innovative circular public procurement [13]. The research demonstrates that the degree of implementation of CE methods corresponds to the level of incorporation with supply chain collaborators. This implies that supply chains exhibiting elevated levels of SCI tend to implement a more comprehensive range of both internal CE methodologies and Circular Supply Chain practices, in contrast to lower-integrated counterparts [14]. SCI encompasses multiple concepts, such as exchanging information, working together, and aligning strategic interests

with key suppliers and customers. So, according to this research, the researcher thinks that sometimes the related stakeholders can be divided into several groups to study according to the pressure level. Also, when enterprises try to conduct CE practices, they may better consider balancing benefits and costs. The above research is just one example; there are still many other aspects worthy of researchers' study or looking at one aspect in depth.

4. Conclusion

This study finds that the supply chain is a very important process in the digital transformation of enterprises. In today's digital era, everything is moving toward digital. Enterprises need to be cautious about applying digitization to supply chain management. Enterprise needs to take the supply chain as the starting point to do more detailed and in-depth research to explore how to improve the success rate of enterprise transformation. Existing studies on the supply chain's impact on enterprise digital transformation are more likely to focus on some general perspectives. In future studies, researchers can start from a more novel perspective and a smaller scope, such as CE practice or taking micro, small and medium-sized enterprises as the research object mentioned in the suggestions section of this paper. To make a better contribution to the academic community.

References

[1] Mao S, Xiao M, Li G. Supply Chain Relationships and Digital Transformation of Firms - An Analysis Based on the Dual Perspectives of Motivation and Capability. Economic and Management Research. 2024(02):98-124.

[2] Chen H, Tian Z. Environmental uncertainty, resource orchestration and digital transformation: A fuzzy-set QCA approach. Journal of Business Research. 2021, 139:184-193.

[3] Dixit VK, Malviya RK, Kumar V, Shankar R. An analysis of the strategies for overcoming digital supply chain implementation barriers. Decision Analytics Journal. 2024, 10:100389.

[4] Deepu TS, Ravi V. A review of literature on implementation and operational dimensions of supply chain digitalization: Framework development and future research directions. International Journal of Information Management Data Insights. 2023, 3:100156.

[5] He B, Mei Q, Liu S, Zhang J. Decision model for binary safety management behavior in a supply chain under digital scenarios: A study based on differential game theory. Heliyon. 2024, 10(5):e26471.

[6] Chen Z, Hammad AWA. Mathematical modeling and simulation in construction supply chain management. Automation in Construction. 2023; 156:105147.

[7] Deepu TS, Ravi V. A review of literature on implementation and operational dimensions of supply chain digitalization: Framework development and future research directions. International Journal of Information Management Data Insights. 2023, 3(1):100156.

[8] Li L, Yi Z, Jiang F, Zhang S, Zhou J. Exploring the mechanism of digital transformation empowering green innovation in construction enterprises. Developments in the Built Environment. 2023, 15:100199.

[9] Jeong H-W, Michael E. Theories of Conflict. Encyclopedia of Violence, Peace, & Conflict (Second Edition), 2008.

[10] González-Mon B, Mancilla-García M, Bodin Ö, Malherbe W, Sitas N, Pringle CB, Biggs RO, Schlüter M. The importance of cross-scale social relationships for dealing with social-ecological change in agricultural supply chains. Journal of Rural Studies. 2024, 105:103191.

[11] Qiu X, Holmen E, Havenvid M, De Boer L, Hermundsdottir F. Open for business: Towards an interactive view on dynamic capabilities. Industrial Marketing Management. 2022, 107:148-160.

[12] Kilay AL, Simamora BH, Putra DP. The Influence of E-Payment and E-Commerce Services on Supply Chain Performance: Implications of Open Innovation and Solutions for Digitalizing Micro, Small, and Medium Enterprises (MSMEs) in Indonesia. Journal of Open Innovation: Technology, Market, and Complexity. 2022, 8(3):119.

[13] Husgafvel R, Linkosalmi L, Sakaguchi D, et al. How to advance sustainable and circular economy-oriented public procurement—A review of the operational environment and a case study from the Kymenlaakso region in Finland. Circular economy and sustainability. 2022: 227-277.

[14] Calzolari T, Bimpizas-Pinis M, Genovese A, Brint A. Understanding the relationship between institutional pressures, supply chain integration and the adoption of circular economy practices. Journal of Cleaner Production. 2023, 432:139686.