DIGITAL TRANSFORMATION AND SUPPLY CHAIN ALIGNMENT OF FREIGHT FORWARDING COMPANIES IN RIVERS STATE

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Abstract: *The study adopted the positive stance of research philosophy. And the quantitative approach. in a non-contrived study setting (environment) with firms and managerial executives as unit of analysis. The population of study consists of seventy-seven (77) freight forwarding companies in Rivers State, a sample size of 44 freight forwarding companies and 132 management staff as respondents. Data was collected from respondents using copies of structured questionnaire, and data was analyzed using the simple regression method. The results depict that, there is a weak, positive and significant influence of digital technology on supply chain alignment. The study therefore concludes that digital transformation significantly influences supply chain alignment of freight and forwarding companies in Rivers State, and recommends that, management of freight and forwarding companies should be prepared to develop sound digital transformation proficiency in emphasizing supply chain alignment that will spectacularly improve their company's operational performance.*

Key Words: *Freight and forwarding companies, Resource based theory, Supply chain digitalization, Supply chain alignment.*

INTRODUCTION

Freight and forwarding companies are inherently focused on maintaining competitiveness for survival. However, not all achieve the desired level of competitiveness due to issues like poor transparency, delays in shipment clearance, lack of real-time shipment tracking, inadequate technology, and the pressing need to refine their service processes. Additionally, many struggle to offer high-quality services at competitive prices, especially when faced with unsolicited alternatives. This challenge is concerning, as it exacerbates non-competitiveness in areas such as supply chain alignment, hindering their ability to achieve sustainable competitiveness. Thus, understanding the impact of digital transformation on supply chain alignment is crucial to addressing these challenges.

Empirical studies support these findings shows that digital transformation enhances transparency and trust within the supply chain (Dubey et al., 2019). Chod et al. (2020) It was equally demonstrated that digital transformation does so more effectively than traditional monitoring systems. Moreover, Shin et al. (2020) found that non-profit organizations utilize digital transformation to boost donations and improve transparency. Sheel and Nath (2019) also pointed out that managers believe digital transformation enhances transaction reliability and transparency. Furthermore, it provides a tamper-proof system for data storage and retrieval. Studies have identified relative advantage as a key factor driving technology adoption (Maroufkhani et al., 2020; Maduku et al., 2016). Wong et al. (2020) confirmed that relative advantage significantly impacts blockchain adoption among SMEs.

It is widely acknowledged that digital transformation offers a platform for greater flexibility and innovation (Venters & Whitley, 2012). However, the extent to which companies possess the skills and motivation to leverage these opportunities remains unclear (Ciborra, 1996). This study addresses this gap by examining how digital transformation influences supply chain alignment digital transformation in freight forwarding companies in Rivers State. Grounded in Resource-Based View (RBV) theory, which sees a firm as a bundle of assets and capabilities, this study explores how digital technologies contribute to opportunity development in a boundaryless, interconnected world.

A substantial body of scholarly research has explored the relationship between digital transformation and supply chain alignment, with much of the work focusing on the challenges of implementing digital transformation within companies (e.g., Pascucci, Savelli & Gistri, 2023; Seclen-Luna, Rene & Lopez, 2022; Saratchandra & Shrestha, 2022; Rongping & Han, 2021; Ikegwuru & Esi-Ubani, 2019; Ikegwuru & Harcourt, 2018). However, there is a scarcity of studies specifically investigating how digital transformation affects supply chain alignment in Rivers State. Based on this gap, the current study proposes that freight forwarding companies in Rivers State can significantly improve their supply chain transparency by embracing digital transformation. Consequently, this study aims to explore the influence of digital transformation on supply chain alignment of freight forwarding companies in Rivers State.

REVIEW OF RELATED LITERATURE
This section reviews related literature on digital transformation and supply chain alignment of freight and forwarding companies in Rivers State. The first part is done on the bases of theoretical foundation and scholarly views on the major concepts of the study, digital transformation and supply chain alignment).

Theoretical Foundation
The theoretical framework provides a foundation, or an anchor, within which a study is be located in. This study is anchored on the. resource-based view theory.

Resource Based View
Resource-based view (RBV) theory has been discussed in strategic management and IS for many years. Using RBV theory in the IS literature emerged in the beginning of 1990s (Taher, 2012). RBV provides a theoretical lens for IS scholars to investigate how IS resources and capabilities can contribute to a firm's strategy and performance (Taher, 2012). RBV holds that an organization can be viewed as a collection of human and physical resources bound together in an administrative framework, the boundaries which are determined by the area of administrative coordination and authoritative communication (Peppard & Wad, 2004). This theory argues that firms possess resources, a subset of which enables them to achieve a

competitive advantage and a further subset that leads to superior long-term performance (Wade & Hulland, 2004). It is the later that gives the firm a sustainable competitive advantage.

Resources that are valuable and rare provide a firm with a competitive advantage while those resources that are inimitable, non-substitutable and immobile provides a firm with a sustainable competitive advantage (Taher, 2012; Wade & Hulland, 2004). Despite the fact that the term resource is a key concept in RBV, confusion reigns with regard to its meaning. RBV theorists have used a variety of different terms to talk about resources including competencies (Prahalad & Hamel, 1990), skills (Grant, 1991), strategic assets (Ross, Beath, & Goodhue, 1996), stocks (Amit & Schoemaker, 1993; Capron & Hulland, 1999) and a collection of assets, competencies, processes etc. (Barney, 1991). In this study, we adopt the definition provided by (Wade & Hulland, 2004) - that resources are assets and capabilities that are available and useful in detecting and responding to market opportunities or threats. The terms 'capabilities' and 'competencies' are frequently used in RBV literature with no clear disambiguation. For example, (Peppard & Ward, 2004) treats competencies and capabilities as different concepts while (Wade & Hulland, 2004) considers competencies and capabilities as synonymous. This study adopts the later since there is not yet a consensus in this matter. This work relies on the resource-based theory (RBT) as a theoretical lens to understand the relationship between a firm's resources and competitive advantage.

Concept of Digital Transformation
Traditionally, companies have treated technology as a tool for communication or data sharing. Digital transformation has ranked much higher on the corporate agenda since the emergence of COVID-19 pandemic (Yei,Liu, Li, Zain & Kumar, 2022; Bonnet & Westerman, 2021). Companies need to start treating technology as a tool for proactive management, which is a hard lesson learned from the impacts and consequences of the COVID pandemic (Kumar & Ganjuly, 2020; Malhotia, Gosain, & El Sawy, 2017; Yei *et al*., 2022). Technology can enable quick and exploratory reactions, as a crucial component of DT involves greater reliance on IT and analytical services (Leonherdt, Haffkey, Kranz & Benlain, 2017).

Implementing the right digital transformation can generate sustainable CADs that are hard for others to imitate (Viale, & Zouari, 2020; Blenhaus & Haddud, 2018). According to Hallikas *et al*., (2021), digitalization can provide improved alternatives for strategic decision-making through the use of better data: from accessing supplier innovation to collaborative platforms and innovation laboratories, sophisticated analytics, greater computing capacity, and improved visualization tools. In humanitarian supply chains, digital transformation plays a crucial role in ensuring the benefits of traceable logistics aids and support reach the right people as quickly as feasible (Khan *et al*., 2022).

In the era of digitalization, companies review how to build competitive advantage by drawing on their capabilities and using technology. It is recognized that Information and Communication Technologies (ICT), and especially digital transformation are fundamentally transforming business strategies, business processes, firm capabilities, products and services, and are even key interfirm relationships in extended business networks. In this context, a digital business strategy is required (Bharadwaj, El Sawy, Pavlou & Venkataraman, 2013). In fact, empirical evidence has highlighted the positive role of digital transformation in increasing the productivity (Popa, Soto-Acosta & Perez-Gonzalez, 2018) and sales (Bayo-Noorcones & Lera-Lopez, 2017) of companies.

Over recent decades, advances in digital transformation have precipitated a major structural transformation in the organization of society and the economy. Ubiquitous digital connectivity has enabled economic and societal processes to be increasingly reorganized to take advantage of digital transformation. This process has transformed also the context within which managers discover and pursue opportunities and compete against established firms (Nambisan, 2017).

Arguably, the most important characteristic of digital transformation is their ability to enable business model innovation – i.e., a radical rethink of how businesses organize for the creation and delivery of customer value and capture this value as business profit (Bouwman, Nikou & De Reuver, 2019; Vorraber & Schirgi, 2019). This is a particularly important opportunity driver for businesses, as established businesses tend to focus on optimizing their existing business models, which may hamper their ability to take advantage of the latest digital opportunities (Autio, Nambisan, Thomas & Wright, 2018). Although the importance of

digitalization and its impact on companies through business model innovation are widely recognized (Autio *et al*. 2018), surprisingly little is still known about the firm-level performance effects of the adoption of digital transformation in the business model (Bouwman *et al*. 2019).

There is widespread acceptance that digitalization has a transformative effect on business opportunity landscapes in countries and on the optimal modes of business opportunity pursuit. Because of digitalization, business activities have become less constrained by spatial, temporal, and sectoral boundaries (Nambisan, 2017). The digitally induced lifting of conventional constraints limiting business agency means that business opportunity pursuit has become a viable occupational option to larger audiences than ever before. (Contigiani & Levinthal, 2019; Bocken & Snihur, 2020). Such ideas have prompted a novel, iterative approach to business opportunity discovery and validation, often referred to as lean entrepreneurship (Blank, 2013; Ries, 2011).

Supply Chain Alignment
Supply chain alignment refers to integrating the processes of supply chain partners aiming to achieve better performance (Sheel & Nath, 2019). Supply chain alignment is integrating the processes of supply chain partners aiming to achieve better performance. Aligning strategies and processes of supply chain partners is essential (Gattorna & Jones, 1998). Several studies revealed the importance of supply chain alignment in developing customer value and gaining competitive advantage, which causes a higher performance (Sheel & Nath, 2019; Wong *et al.,* 2012). Tuominen *et al.* (2004) declared that in a challenging and complicated company environment, adaptability resembles one of the essential requirements for sustainable competitive advantage and high performance. The probable relationship between the Triple-A supply chain variables, namely alignment, adaptability, and agility, was explored in the study by Dubey and Gunasekaran (2016). Dubey and Gunasekaran (2016) found that humanitarian supply chain adaptability is positively influenced by alignment. Supply chain alignment leads to adaptability due to process enhancement, information integration, flexibility, visibility, and data quality. Moreover, Alfalla-Luque *et al.* (2018) stated that supply chain adaptability is positively influenced by supply chain alignment.

Empirical Review of the influence of Digital Transformation and supply Chain Alignment

Autio, Fu, Willem, Anang, Chiraphol, Pattarawan, Phạm, Habaradas, Petalcorin, Jinjarak, and Donghyun (2022) examined adoption of digital technologies, business model innovation, and financial and sustainability performance in startup firms. They tested the theoretical model with a questionnaire interview survey of a total of 685 digital entrepreneurial businesses in six ASEAN countries: Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Viet Nam, and found that, the adoption of digital technologies by entrepreneurial businesses has more wide-ranging beneficial impacts than their facilitating effect on business model experimentation

Platonova, Khuziakhmetov, Prokopyev, Rastorgueva, Rushina, and Chistyakov (2022) conducted an exhaustive examination of prior studies on knowledge in digital contexts. The databases ERIC and Scopus served as the search grounds for the keyword-based inquiry. The collected documents were evaluated to determine whether or not they contributed to the investigation's objective. The cornerstone of our inquiry was a careful review of the remaining 14 studies. For quantitative investigations, the experimental design was the most desired approach, but the case study method was the most preferred method for qualitative research. The objectives of the research employ the terms knowledge and digital environments either directly or implicitly. Studies were designated as creating with cooperation acquiring presenting and sharing. In the research, data was coded in accordance with the responsibilities assigned in digital worlds. In the study, 10 distinct theories and models were referenced. These models and hypotheses are categorized based on such things as creating, acquiring, designing, and using their interaction with data. In the investigations, the existence of traditional knowledge creation and application has been investigated. In addition, the process's distinction owing to the capabilities of digital environments has been investigated.

Rongping and Han (2021) measures the development level of digital business environment in 30 provinces from 2015-2021 and examines the influence mechanism between digital business environment and enterprise innovation capability based on the perspective of innovation input and innovation output using a two-way fixed-effect model with data from Shanghai and Shenzhen listed A-share enterprises. The conclusions show that the digital business environment significantly enhances the innovation capability of enterprises, and improving the quality of internal control is a critical path for the digital business environment to enhance the innovation capability of enterprises. The findings of the study have implications for the government to optimize the digital business environment and for enterprises to enhance their innovation capabilities.

Based on literature review, the following conceptual framework was designed:
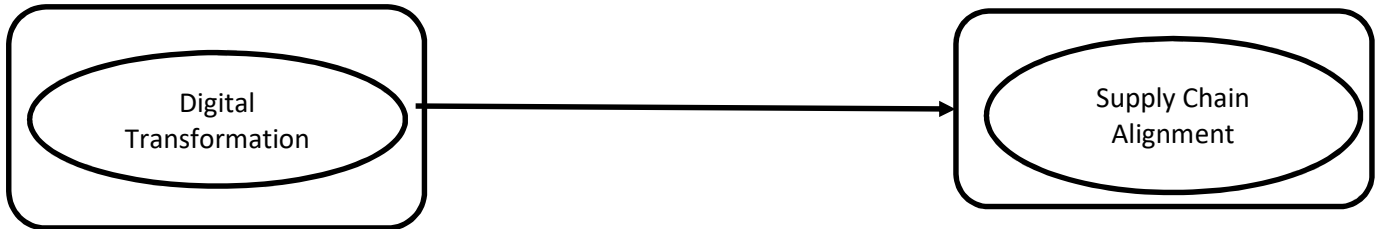
Figure 1: Conceptual framework of Digital Technology and Supply Chain Alignment.

Sources: designed by the Researchers, (2025).

Based on the conceptual framework, the following hypothesis was raised:

Ho$_1$: Digital transformation does not significantly influence supply chain alignment of freight forwarding companies in Rivers State.

METHODOLOGY

The study adopted the positive stance of research philosophy. And the quantitative approach. in a non-contrived study setting (environment) with firms and managerial executives as unit of analysis. The population of study consists of seventy-seven (77) freight forwarding companies in Rivers State, a sample size of 44 freight forwarding companies and 132 management staff as respondents. Data was collected from respondents using copies of structured questionnaire, and data was analyzed using the simple regression method

Reliability of the Research Instrument

The reliability scale was examined by computing their coefficient alpha (Cronbach alpha). All scale exceeded a minimum threshold of 0.7 as recommended by Cronbach (1970) and Nunnally (1978). This is shown in Table 1.

Table 1: Shows the reliability measure of Digital Transformation and Supply Chain Transparency.

Scale	Dimension	Items	Reliability
DT	Digital Transformation	3	0.742
SCA	Supply Chain Alignment	3	0.761

Source: *SPSS 22.0 Output, based on 2025 field survey data*.

Table 1 recapitulate the reliability result of digital transformation and supply chain alignment, which also incorporates the individual item reliability test. Appreciably, all items are reliable and are employed to study digital transformation and supply chain alignment of freight and forwarding firms in Rivers State. The level

HO$_2$

of the alliance between digital transformation and supply chain alignment can be operationalized by means of digital transformation (.742) with a 3-item measure and supply chain alignment (.761) with 3-items measure.

RESULTS

Influence of Digital Transformation on Supply Chain Alignment

Ho$_1$: Digital transformation does not significantly influence supply chain alignment of freight forwarding companies in Rivers State.

Table 2 Influence of Digital Transformation on Supply Chain Alignment (n=123)

Model Summary

Model R	R square	Adjusted Square	R std error of the Estimate
1 . 246ª	.224	.222	.49787

ANOVA of Digital Transformation and Supply Chain Alignment

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	59.078	1	59.078	778.697	.000ª
Residual	23.849	122	.406		
Total	77.945	123			

Coefficients of Digital Transformation and Supply Chain Alignment

Unstandardized Coefficients Standardized

Model	B		Std. error	Beta	T	Sig.
1 (constant) -.		.1864	.160		10.206	.000
.896	.078	.346	17.764	.000		

Source: SPSS 22.0 window output (based on 2025)

Decision: Since for hypothesis one, the significant is .000 which is lesser than 0.05; there is a significant effect of digital transformation on supply chain alignment with the R (Coefficient of Correlation) that there is 24.6% direct relationship between digital transformation and supply chain alignment. R–square value of 22.4% shows that digital transformation can affect supply chain alignment to some degree. The ANOVA Table explains the fitness of the model as shown by the F-ratio in the model is 778.697, which is very significant at $p < 0.05$. This implies that there is significant evidence to extrapolate that digital transformation is linearly related to supply chain alignment. This proposes that the model is measured to be fit, and that digital transformation has some influence on supply chain alignment. There is also a standardized coefficient of .346 which is perfect as well as corresponding P- value (sig.) of .000 which is lesser than alpha (0.05). Therefore, we conclude that digital transformation significantly influences supply chain alignment of freight forwarding companies in Rivers State.

DISCUSSIONS

The results of hypothesis one show that digital transformation has a weak, positive and significant influence on supply chain alignment (0.246: 0.000 <0.05). The result suggests that digital transformation has positive and significant influence on supply chain alignment, thus leading us to strongly reject the null hypothesis of no significant influence between the two variables. A priori, we expected a positive and significant relationship between digital transformation and supply chain alignment, and in line to this position, our results also point to the direction we are heading and are equally useful for our analysis. Thus, our finding

supports this view as regards digital transformation on supply chain alignment and implies that digital transformation minimally increased the supply chain alignment of the companies in our sample. The finding is in line with Pascucci *et al*. (2023) whose results show that digital technologies are widely used by firms, and Seclen-Luna *et al*. (2022) findings that indicate a positive influence of digital technologies on net sales and productivity.

CONCLUSION

This study investigates the influence of digital transformation on supply chain alignment of freight and forwarding companies in Rivers State. It is manifest from the outcomes that; digital transformation has a weak influence on supply chain alignment. The study therefore concludes that digital transformation significantly influences supply chain alignment of freight and forwarding companies in Rivers State, and recommends that, management of freight and forwarding companies should be prepared to develop sound digital transformation proficiency in emphasizing supply chain alignment that will spectacularly improve their company's operational performance.

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