MANAGEMENT
2025, Vol. 29, No. 2
www.management-poland.com
DOI: 10.58691/man/215696

SABAHATTIN ÇETIN
HALIL KARLI
YUNUS EMRE TOPCU
RAMAZAN YILMAZ

Consequences of Digital Transformation in the Logistics Industry: The Role of Dynamic Capabilities

Abstract

Research background and purpose: Digital transformation is increasingly recognized as a strategic necessity for logistics service providers, reshaping information exchange, operational processes, and service quality. Within this context, dynamic capabilities represent the organizational competencies that enable firms to adapt, reconfigure, and renew their resources to maintain sustainable competitiveness. This study explores the role of dynamic capabilities in driving digital transformation in logistics service providers and examines their effects on different dimensions of firm performance.

Design/methodology/approach: This study used a quantitative research design, collecting data through face-to-face surveys with middle- and senior-level managers in the logistics sector. The proposed hypotheses were tested using structural equation modelling (SEM).

Findings: The findings indicate that adaptive capability and absorptive capacity have significant positive effects on digital transformation, while innovation capability does not yield a statistically significant impact. Furthermore, digital transformation positively influences logistics service performance and innovation performance, although its effect on financial performance is found to be minimal.

Value added and limitations: The findings highlight the importance of developing dynamic capabilities to successfully implement and maintain digital transformation, which in turn improves organizational performance and strengthens competitiveness in the logistics sector. The study is limited to large logistics firms, and the results may not be fully applicable to other sectors or to small and medium-sized enterprises that have different structural characteristics. In addition, the analysis focused only on the quantitative relationship between dynamic capabilities and digital transformation, while future studies may examine other competencies such as collaboration and integration. Finally, although this study evaluated the impact of digitalization on service, innovation, and financial performance, future research could also consider outcomes such as customer satisfaction, loyalty, and quality management.

Keywords: *digital transformation, logistics industry, dynamic capabilities, company performance*

JEL Classification: L20, L91, M10

Received: 2025-09-30; **Revised:** 2025-11-27; **Accepted:** 2025-12-16

Sabahattin Çetin
Department of International Trade and Logistics, Faculty of Economics and Administrative Sciences, Bartin University, Turkey; ORCID: 0000-0001-9686-1806

Halil Karlı
Department of International Trade and Logistics, Faculty of Economics and Administrative Sciences, Bartin University, Turkey; ORCID: 0000-0002-5366-9774

Yunus Emre Topcu ✉
Department of International Trade and Logistics, Faculty of Economics and Administrative Sciences, Bartin University, Turkey; email: ytopcu@bartin.edu.tr
ORCID: 0000-0003-4324-1376

Ramazan Yılmaz
Department of Computer Technology &Information Systems, Faculty of Science,Bartin University, Bartin University, Turkey; ORCID: 0000-0002-2041-1750

1. Introduction

In the contemporary era characterized by rapid technological advancements, digital transformation has emerged as a vital strategic priority for firms. It represents an entrepreneurial adaptation process through which organizations revise or replace business models that were previously effective (Vaska et al., 2021). This transformation entails integrating digital technologies across various operational areas to enhance efficiency, productivity, profitability, and customer engagement. For companies striving to optimize their internal processes, enrich customer interactions, and develop innovative business models, digital transformation constitutes a fundamental requirement (Hajiheydari et al., 2022). Essentially, it signifies a profound and accelerated shift in corporate structures, workflows, skills, and operational paradigms (Yu et al., 2023).

The increasing influence of digital technologies has made digital transformation a crucial necessity for logistics service providers (LSPs) (Cichosz et al., 2020). Integrating digital tools enhances service efficiency and quality while advancing logistics infrastructure and enabling innovative services for manufacturing (Li et al., 2022a). This process includes supply chain digitalization, online operations, and technology-based services (Nousopoulou et al., 2022). By strategically using digital technologies, firms can strengthen customer value creation, collaboration, and operational efficiency (Dwipayana et al., 2021; Savastano et al., 2021). When digital transformation is treated as a strategic priority and aligned with management and operations, firms can fully exploit its benefits and improve performance (Li and Fei, 2023).

Digitalizing logistics processes is a key global trend aimed at improving information exchange and efficiency in transport enterprises (Nikiforov et al., 2023). For logistics service providers, digital transformation enhances value-based sales, customer insight, and innovation in products and services (Hauke-Lopes et al., 2022). It enables firms to create new customer value, meet evolving needs, and develop sustainable business models (Daradkeh et al., 2023). This transformation supports competitiveness, cost reduction, and performance improvement (Yıldız & Çiğdem, 2022). LSPs must therefore adopt digital transformation to build sustainable logistics systems (Taufani & Widjaja, 2022). Yet, research indicates that logistics firms lag behind other sectors in adopting digital technologies (Cichosz et al., 2020; Mathauer & Hofmann, 2019).

Studies highlight the need for developing new capabilities to remain competitive in the digital age (Liu et al., 2011; Sousa Zomer et al., 2020; Vial, 2019). Warner and Wäger (2019) state that dynamic capabilities enable traditional firms to address the challenges and opportunities created by digital transformation. These capabilities allow organizations to adapt to changing conditions and reorganize their resources to gain and sustain long term advantages (Teece, 1997). Therefore, dynamic capabilities offer valuable insights into the digital transformation processes of logistics service providers.

In today's rapidly changing market environment shaped by digital technologies, dynamic capabilities function as an essential mechanism that enables firms to sustain competitive advantage and successfully implement digital transformation initiatives (Lei et al., 2021). Through these capabilities, organizations can adjust to technological advancements, identify and seize emerging market opportunities, and redefine traditional business models using digital tools and systems (Ellström et al., 2021). Unlike ordinary operational capabilities, dynamic capabilities are inherently associated with change, emphasizing the reconfiguration of organizational resources, particularly those based on knowledge. They focus on transforming operational capabilities, thereby influencing firms' products, production processes, and overall adaptability (Cepeda-Carrión & Vera, 2007). Moreover, dynamic capabilities are instrumental in digital transformation, as they empower firms to optimize their activities and resources by effectively leveraging new technologies and digital innovations (Abdurrahman et al., 2023).

Existing research consistently highlights the critical role of dynamic capabilities in facilitating digital transformation. Nevertheless, most of these studies conceptualize dynamic capabilities primarily through the framework proposed by Teece (2007). A closer examination of the dynamic capabilities literature reveals, however, that scholars have adopted varying perspectives on the specific sub-dimensions and constituent elements of these capabilities (Bektaş et al., 2022). For example, Eisenhardt and Martin (2000) consider the gain and release of resources, reconfiguration of resources and resource transformation capabilities, Zott (2003) considers variation, selection and retention capabilities, Ambrosini, Bowman and Collier (2009) consider incremental capability, renewing capability and regenerative capabilities as dynamic capabilities. Wang and Ahmed (2007) conceptualize adaptive capability, absorptive capacity, and innovation capability as the core dimensions of dynamic capabilities. A survey of the existing literature reveals that extensive research has explored the significance of dynamic capabilities in various organizational contexts. This review highlights a critical gap in the existing literature: there is a lack of empirical evidence explaining how adaptive, absorptive, and innovative capabilities jointly influence the digital transformation outcomes of large logistics providers operating in emerging markets. Although dynamic capabilities have been widely examined in manufacturing and general service sectors, their selective influence within resource-rich yet institutionally volatile logistics environments remains theoretically underexplored. This study addresses this gap by empirically examining the DC → DT → Performance chain in the context of Türkiye's logistics industry. Building upon this foundation, this study aims to investigate how dynamic capabilities shape the digital transformation of logistics firms and how digital transformation influences organizational performance. "Accordingly, the study pursues the following research objectives:

1) to examine how adaptive, absorptive, and innovative capabilities drive digital transformation in large logistics service providers;
2) to analyse the impact of digital transformation on organizational performance;
3) to assess the differentiated effects of the three dimensions of dynamic capabilities within the emerging-market logistics context;
4) to develop and empirically validate an integrated DC → DT → Performance model tailored to the characteristics of Türkiye's logistics industry."

Unlike most prior studies, this research reveals two critical non-significant relationships: innovation capability does not directly drive digital transformation, and digital transformation does not immediately lead to enhanced financial performance. These findings challenge the dominant assumptions of dynamic capabilities theory and demonstrate that the DC → DT → Performance chain operates differently in large logistics providers operating in emerging-market conditions. Based on the identified research gap and the objectives of the study, the following research questions were formulated:

(RQ1) How do adaptive, absorptive, and innovative capabilities influence the level of digital transformation in large logistics service providers?
(RQ2) Does digital transformation significantly affect organizational performance in the context of Türkiye's logistics industry?
(RQ3) Why do the three dimensions of dynamic capabilities exhibit differentiated effects during the digital transformation process in emerging markets?
(RQ4) How does the integrated DC → DT → Performance model operate within the unique institutional and operational characteristics of an emerging-market logistics environment?"

Another objective of this study is to analyse the impact of digital transformation on the performance of logistics service providers. Its impact varies across industries and contexts (Annarelli et al., 2021; Hanelt et al., 2021; Vial, 2019). Evidence shows that digital transformation enhances productivity, transparency, and efficiency (Wang et al., 2024) while improving cost efficiency, sustainability, security, and customer experience (Agarwal et al., 2010; Abiodun et al., 2023). This study analyses its effects on financial, innovation, and logistics service performance using data from logistics firms in Türkiye. This approach extends Wang and Ahmed's (2007) dynamic capability framework by incorporating sector-specific challenges unique to the logistics industry. Furthermore, a tailored conceptual model was developed to illustrate how logistics companies uniquely adopt and implement digital transformation.

The article is organized as follows: first, the literature is reviewed and hypotheses are developed; next, the empirical analysis is presented; and finally, the findings are discussed with recommendations for future research and practice.

2. Theoretical background and hypotheses

2.1. Digital transformation

Digital transformation has garnered significant scholarly attention in recent years (Annarelli et al., 2021; Jones et al., 2021; Vial, 2019). The term is broadly characterized as leveraging emerging digital technologies, including social media, data analytics, mobile applications, and embedded systems, to enhance customer experience, optimize operational efficiency, and advance business models (Fitzgerald et al., 2014). Beyond this, digital transformation represents a comprehensive and accelerating restructuring of business processes and organizational structures designed to fully capitalize on digital opportunities (Demirkan et al., 2016).

Requiring a broad restructuring of organizational structures, operations, competencies, and business models (Govindarajan & Immelt, 2019), digital transformation is not merely the adoption of a single technology. Instead, it involves integrating advanced technologies to connect physical and digital systems (Cichosz et al., 2020). This transformation moves beyond basic tool usage, necessitating the redesign of core business processes and the creation of new value propositions (Antonucci et al., 2021). The central outcome of this shift is value creation (Cichosz et al., 2020). This value is multifaceted, ranging from operational efficiency and cost reduction to improved customer experience, strategic differentiation, competitive advantage, new product development, and stronger stakeholder relations (Raza et al., 2023).

2.2. Dynamic capabilities and digital transformation

Dynamic capabilities are central to the digitalization processes of firms. The framework, as introduced by Teece et al. (1997), clarifies how organizations create and sustain value amidst rapidly evolving technological contexts. Digitalization is defined by Daradkeh et al. (2023) as the adoption and integration of digital technologies into business operations to boost efficiency and stimulate innovation. Consequently, dynamic capabilities enable firms to integrate, develop, and reorganize existing competencies, allowing them to adapt effectively to the demands of digital transformation (Ellström et al., 2021).

Teece et al. (1997) define dynamic capabilities as a firm's ability to reorganize its resources to ensure sustained competitiveness during environmental changes. This framework is a primary lens in strategic management for examining technological adaptation (Eisenhardt & Martin, 2000; Teece, 2007). Given the substantial influence of digital technologies on performance, this perspective provides a strong theoretical foundation for analysing and comprehending digital transformation processes (Warner and Wäger, 2019).

Dynamic capabilities contribute to the long-term survival of a business rather than just providing temporary adaptation (Coşkun & Özyılmaz, 2016). Dynamic capabilities differ fundamentally from a firm's operational capabilities. While operational capabilities enable organizations to utilize their existing resources with efficiency and effectiveness, dynamic capabilities extend beyond this function by allowing firms to reconfigure, renew, and expand their resource base in pursuit of new opportunities and growth potential (Rashid & Ratten, 2020). Dynamic capabilities are associated with high-level activities such as responding to changing customer needs, seizing and exploiting opportunities to sustain and advance evolutionary conditions, identifying threats, and combining and reconfiguring private and common assets.

In today's turbulent market conditions and within the rapidly evolving digital economy, organizations are increasingly compelled to pursue digital transformation. In this context, dynamic capabilities are key to maintaining competitive advantage and managing transformation effectively. Empirical research highlights that dynamic capabilities are highly compatible with digital transformation initiatives and have become a critical determinant of superior business performance (Ringov, 2017). During the digitalization process, firms integrate and reconfigure their existing resources and competencies, enhance products and services, and reinforce core operations by leveraging technological advancements and expanding market reach. These efforts gradually reshape operational structures and foster business model innovation (Enkel & Sagmeister, 2020). Within digital transformation, dynamic capabilities are typically manifested through a top-down process that shapes managerial perspectives and reinforces financial foundations (Ellonen et al., 2009). According to Wang and Ahmed (2007), dynamic capabilities represent a firm's behavioural orientation to integrate, renew, and reconfigure resources in order to strengthen core competencies and maintain competitiveness. The literature generally classifies dynamic capabilities into three main dimensions: adaptive capability, absorptive capacity, and innovation capability.

2.3. Adaptive capability

Adaptive capability is an organization's ability to identify market trends and seize new opportunities, reflecting the core of dynamic capabilities (Teece et al., 1997). This competence is vital for navigating volatile and unpredictable environments, as it allows organizations to adjust proactively to shifts in markets, technological progress, and other external dynamics (Rangaswamy, 2021).

Adaptive capability includes managerial, market, and technological dimensions (Akgün et al., 2012). Managerial adaptability reflects how management systems encourage questioning outdated practices, enabling quick and continuous organizational response to market changes. Technological adaptability reflects a firm's competence in

tracking technological developments, acquiring and integrating relevant technologies, maintaining complementarities across systems, enhancing product quality and functionality, and mitigating technological risks. Market adaptability, on the other hand, emphasizes rapid learning processes that allow firms to anticipate industry dynamics, address customer needs, and respond to competitors' actions effectively. In digital transformation, adaptive capability enables firms to handle environmental uncertainty and use digital technologies to improve performance. Studies show that firms with stronger adaptive capability manage transformation complexities more effectively and achieve better results (Liu et al., 2021). Sousa-Zomer et al. (2020) emphasize understanding this capability, while Demeter et al. (2021) demonstrate its role in resource reconfiguration during digital manufacturing. The COVID-19 pandemic further revealed that firms with high adaptability used digital transformation strategically to respond to crises (Wu et al., 2023).

Adaptive capability is vital for enhancing organizational responsiveness to environmental changes and ensuring the effective implementation of digital transformation. Logistics service providers with this ability will be able to respond to digital change in the sector in a timely manner. In addition, these companies will have a better advantage in finding digital solutions that will provide and maintain customer satisfaction and competitive advantage. The hypothesis developed in this framework is as follows:

H1. Adaptive capability has a significant positive impact on digital transformation.

2.4. Absorptive capacity

Absorptive capacity involves acquiring technological and scientific knowledge from external sources and transferring it into the organization (Jiménez-Jiménez & Sanz-Valle, 2011). It is defined as the set of organizational skills that help assimilate and modify external tacit knowledge (Mowery et al., 1996) and as the learning and problem-solving ability that allows firms to internalize and generate new knowledge (Kim, 1997).

The ability to acquire and internalize external knowledge is essential for transforming it into new insights and value (Kastelli et al., 2024). In digital transformation, continuous absorption of external knowledge supports integration, innovation, and effective application. A strong absorptive capacity helps firms adapt quickly to market changes and accelerate product development (Wang et al., 2023).

Absorptive capacity enables firms to identify the knowledge and technologies most valuable for their future growth (Shan, 2023). However, there are also studies that digitalization positively affects absorptive capacity. (Coronado-Medina, et al., 2020; Shan, 2023). Therefore, while logistics service providers are successful in finding digital solutions that will enable them to effectively and efficiently continue their logistics

processes by increasing their absorptive capacity, the digital technologies they use also enable the development of companies' absorptive capacity. At the end of the process, logistics service providers gain the opportunity to increase both their digitalization levels and their absorptive capacity. The hypothesis developed in this direction is as follows:

H2. Absorptive capacity has a significant positive impact on digital transformation.

2.5. Innovation capability

Innovation capability refers to an organization's capacity to generate new ideas, foster innovation, and effectively utilize internal knowledge. This capability encompasses various dimensions, including innovation potential, processes, and outcomes, while also involving the restructuring and development of organizational resources to support innovative activities (Srisathan et al., 2022; Calik & Calişir, 2019; Thuy & Ngoc, 2017). According to Wang and Ahmed (2004), innovation capability reflects a firm's ability to develop new products or enter new markets by aligning its strategic innovation orientation with supportive behaviours and processes. It entails the continuous transformation of knowledge and ideas into valuable products, processes, and systems that benefit both the firm and its stakeholders. Furthermore, it represents a key organizational competence that enables firms to design and implement effective innovation strategies (Dodgson et al., 2008).

Maintaining external compatibility requires businesses to continuously reinforce or renew their resource base (Wilden et al., 2013). Innovation capability is defined as a firm's skill in integrating and reconfiguring internal and external competencies for adapting to rapidly shifting environments. It specifically involves the utilization of external knowledge and the creation of novel products and processes (Piening & Salge, 2014; Wang & Chen, 2013; Camio et al., 2018). Therefore, in the digital era, logistics service providers must improve their innovation capabilities to ensure competitiveness and adaptability. This leads to the following hypothesis:

H3. Innovation capability has a significant positive impact on digital transformation.

2.6. Consequences of digital transformation

The extensive diffusion of digital technologies has enhanced information exchange both within and across organizational boundaries, effectively diminishing traditional barriers between firms. By leveraging these technologies, organizations can mitigate their internal limitations in terms of resources and human capital, while simultaneously accessing external expertise and assets. This capability enables firms to pursue strategies

aimed at entering new markets and developing innovative products more effectively (Chen & Kim, 2023). Some studies emphasize that digital innovation management can revolutionize traditional innovation processes by using digital technologies to create, transform and benefit from new technologies (Nambisan et al., 2017). Digital technologies remove organizational boundaries, enabling access to diverse information. This abundance of data creates opportunities for product and service innovation (Li et al., 2022b).

Gaglio et al. (2022) emphasize that the adoption of digital communication tools and social media platforms exerts a positive influence on firms' innovation activities. Similarly, Chen and Kim (2023) state that digital transformation significantly improves innovation performance in both quantity and quality. According to these scholars, digital transformation contributes to more efficient resource allocation within firms, reinforces inter-organizational linkages, reduces traditional boundaries between enterprises, and facilitates a more balanced distribution of research and development expenditures.

Digital transformation has also become an important factor affecting innovation performance for logistics service providers. The adoption of digital technologies has transformed competition in the logistics sector, compelling firms to digitalize (Cichosz et al., 2020). Research indicates that digital transformation enhances corporate innovation and boosts green innovation outcomes (Li, 2023). Digital transformation not only improves innovation capacity, but also positively affects technological innovation performance and absorptive capacity in various sectors, especially during recession periods (Liu et al., 2023).

Digital transformation influences innovation performance by reshaping processes, enhancing capabilities, and promoting sustainability. Studies highlight its strong effect on firms' innovation outcomes and the need to understand these impacts (Usai et al., 2021). Accordingly, digital transformation is expected to affect the innovation performance of logistics service providers. The following hypothesis is proposed:

H4. Digital transformation has a significant positive impact on innovation performance.

Digital transformation is increasingly recognized as a critical factor shaping financial performance across various industries. Empirical evidence demonstrates that adopting digital technologies can enhance financial outcomes by improving operational efficiency, reducing costs, strengthening competitive advantage, and optimizing overall performance (Theiri & Hadoussa, 2023). Many studies have demonstrated a positive relationship between digital transformation and financial performance in various sectors such as manufacturing (Ji et al., 2022; Li et al., 2023), banking (Trang et al., 2022), and hospitality (Alrawadieh et al., 2020). However, some research reports differing results, indicating that the impact of digital transformation on financial performance may vary

according to contextual and organizational factors (Jardak & Ben Hamad, 2022; Nasiri et al., 2022; Yu et al., 2023).

Research examining the relationship between digitalization and financial performance has yielded varied findings. Zhou et al. (2023) demonstrated that digitalization among logistics service providers enhances both financial performance and service quality through improved customer collaboration. Similarly, Chatterjee et al. (2023) found that supply chain digitalization positively influences firm performance, whereas Yu et al. (2023) identified an inverted U-shaped relationship between digitalization and performance. In contrast, Nasiri et al. (2022) argued that digitalization affects financial performance indirectly through digital maturity and intensity, while Jardak and Ben Hamad (2022) reported a negative association.

Overall, studies indicate that digital transformation is a key driver of financial performance across different sectors and firm sizes, though findings remain multifaceted. When evaluated in terms of logistics service providers, companies can increase operational efficiency, customer collaboration and overall service quality by taking advantage of digitalization, and as a result, positively affect their financial results. The hypothesis developed in this framework is as follows:

H5. Digital transformation has a significant positive impact on financial performance.

Logistics service performance can be defined as a logistics provider's capability to consistently fulfil customer orders by delivering products within the agreed timeframe and at an acceptable cost level (Stank et al., 2003). It reflects the extent to which a provider effectively and efficiently satisfies customer requirements. To enhance service performance, logistics service providers must develop, allocate, and manage their resources strategically to address the evolving logistics needs of their clients (Yang, 2016).

Digital technologies have a significant impact on consumer behaviour. Access to information and communication opportunities provided by digital technologies facilitate consumers' access to information. Using these technologies, customers can communicate directly with the company (Vial, 2021) and track the products they purchase from start to finish. For companies, digitalization helps increase transparency and reliability through the information systems used and improves the service quality of logistics companies (Abou-Foul et al., 2021).

Improving logistics service performance requires high service quality, faster and more accurate deliveries, and flexibility in meeting customer demand (Zhou et al., 2023). Integrating digital technologies supports these goals by enhancing speed, quality, and service personalization (Li et al., 2022a). Accordingly, digital transformation is expected to improve logistics service quality. The following hypothesis is proposed:

H6. Digital transformation has a significant positive impact on logistics service performance.

3. Methods

3.1. Research model, participants, and procedure

This study primarily investigates how dynamic capabilities influence the digital transformation of the logistics industry. Adaptive capability, absorptive capacity, and innovation capability are examined as key dimensions of dynamic capabilities. The secondary aim is to analyse the impact of digital transformation on firms' performance, focusing on innovation, financial, and logistics service outcomes. The conceptual model illustrating these relationships is presented in Figure 1.

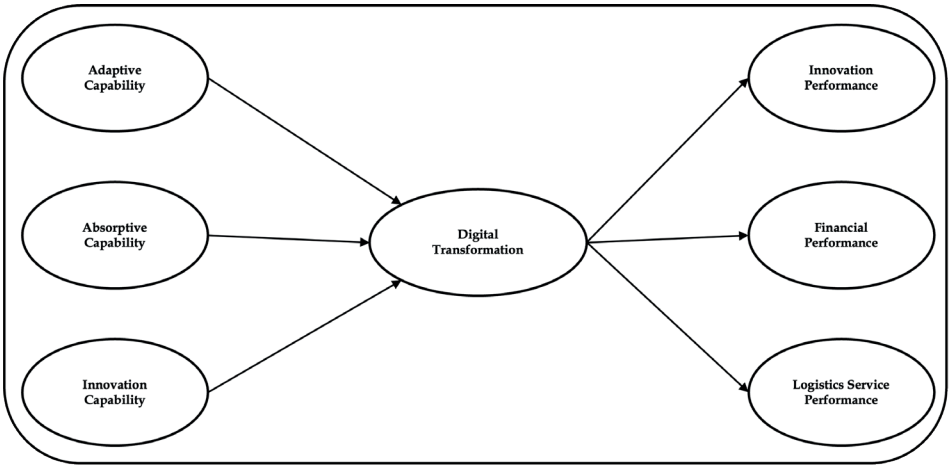

Figure 1. **Research model**

Source: own study

The number of companies in the logistics sector in Türkiye is not known precisely due to those that have not received an authorization certificate and the uncertainty about which companies constitute the logistics sector. It is not clear whether distribution companies, pipeline operators and customs clearance companies will be included in the sector. Likewise, determining the precise scale of the logistics sector is challenging, as many large manufacturing firms manage their logistics operations internally, integrating these activities directly with their production processes (Türkiye Ministry of Development, 2018). This situation makes it difficult to determine the number of businesses in the universe. However, logistics service providers, transportation organizers; companies that provide the organization of the

transportation process, 2PL; companies that provide only one logistics activity, 3PL; companies that provide at least two or more logistics activities, and 4PL; companies that provide supply management services can provide services in many different structures. Therefore, the population of the part of this study that will be evaluated with a quantitative approach consists of all logistics service providers. The sample size was determined as 500 at a 95% confidence level, considering incomplete and incorrectly filled surveys. Data was collected from 573 companies in case there were incomplete or incorrectly filled surveys.

The sampling frame was constructed using the UTIKAD Member Directory and the TOBB Transport and Logistics Registry, which together provide the most comprehensive publicly accessible listings of logistics service providers in Türkiye. A purposive sampling strategy was adopted due to the fragmented structure of the Turkish logistics market, where no single database contains a complete list of active firms. Companies were included in the sample if they (1) were registered as logistics service providers, and (2) operated at least one of the following activities: transportation, warehousing, or distribution. This approach ensured that all participating firms had organizational structures relevant to digital transformation practices. In total, 573 firms that met this inclusion criteria were contacted during the data collection period. When selecting the companies to collect data, priority was given to medium-sized and large companies as participants. Digitalization in logistics is generally more prevalent among large firms than SMEs. This is mainly because large enterprises possess greater financial resources to invest in advanced technologies such as tracking systems, digital information flows, artificial intelligence, and automation (Taiminen & Karjaluoto, 2015; Kuteyi & Winkler, 2022). They also benefit from established partnerships with technology providers, which facilitate the adoption and integration of digital solutions (Hofmann & Osterwalder, 2017). Large enterprises possess the scale and capacity to manage the complexities of digitalization, supported by organizational structures that help address challenges such as resistance to change and data security issues (Szegedi et al., 2022). They can also use their influence to promote industry-wide digitalization standards (Herold et al., 2021). Firm size was determined based on the number of employees.

3.2. Data collection tools

The data required for the research model were collected through face-to-face surveys administered to middle- and senior-level managers in the participating logistics firms. This approach was selected because these managers are directly involved in operational and strategic decision-making processes related to digital transformation, making them the most appropriate respondents for the constructs examined in this study.

Data collection was carried out between May–August 2022. Participation was voluntary, and respondents were informed about the academic purpose of the study before completing the questionnaire. No personal or sensitive data were collected, and all responses remained anonymous. The study was reviewed and approved by the Bartın University Social and Human Sciences Ethics Committee (Protocol No: 2022-SBB-0072). The full version of the questionnaire, including all measurement items and demographic questions, is provided in Appendix A as Supplementary Material. The information about the scales used in the creation of the survey is as follows:

Dynamic capabilities were measured based on Wang and Ahmed's (2007) model. Since no standardized scale exists, relevant literature was used to operationalize the constructs. Adaptability was measured using Akgün et al. (2012), which includes 13 items across management system, market, and technology dimensions. Absorptive capacity was measured using the scale developed by Flatten et al. (2011). The scale consists of four dimensions, namely acquisition (3), assimilation (4), transformation (4) and exploitation (3), and 14 statements. The study of Caloghirou et al. (2004) was used for innovation capability. The scale consists of one dimension and six statements.

The degree of *digital transformation* was assessed using the scale developed by Nadeem et al. (2018) and subsequently adapted into Turkish by Sağlam (2021).

This measurement tool comprises a single dimension and includes a total of 12 statements.

The study of Wang and Ahmed (2004) was used to measure *innovation performance*. The scale consists of a single dimension and 4 statements.

Profitability, market share and cash flow were determined as criteria for *financial performance*. Scale statements were adapted from the study of Seggie et al. (2006) and consist of 3 statements.

The study of Hsiao (2010) et al. was used to measure *logistics service performance*. The scale consists of a single factor and 4 statements. The survey form to be used in the study is given in the appendix.

3.3. Analysis of data

Structural Equation Modelling (SEM) analyses were conducted using AMOS 23.0. To assess construct validity, a Confirmatory Factor Analysis (CFA) was performed prior to testing the structural model. Convergent validity was evaluated based on factor loadings, Average Variance Extracted (AVE), and Composite Reliability (CR), while discriminant validity was assessed using the Fornell–Larcker criterion. All measurement items exceeded the recommended thresholds for reliability and validity.

4. Findings

4.1. Information on participant characteristics

Table 1 provides information on the duties of the participants participating in the study. It is seen that all the participants were working in managerial positions in their companies.

Table 1. **Information on the duties of the participants**

Task	Frequency	Percentage
R&D Manager	38	6.6
IT Manager	16	2.8
Department Manager	38	6.6
Foreign Trade Manager	31	5.4
Foreign Trade Specialist	30	5.2
Finance Manager	30	5.2
Group Manager	11	1.9
Public Relations Manager	11	1.9
Administrative Affairs Manager	28	4.9
Human Resources Manager	26	4.5
Quality Manager	24	4.2
Logistics Manager	15	2.6
Financial Advisor	51	8.9
Accounting Manager	69	12.0
Middle Level Manager	20	3.5
Marketing Manager	33	5.8
Purchasing Manager	25	4.4
Production Manager	61	10.6
Senior Manager	16	2.8
Total	573	100.0

Source: own study

Table 2 presents twhe activity duration of the participating companies, showing that 4.2% have operated for 20 years or less. It is observed that the activity duration of most of the companies is between 22 and 60 years.

Table 2. **Activity durations of the companies**

Age of the company	Frequency	Percentage
0-20	24	4.2
21-30	112	19.5
31-40	134	23.4
41-50	139	24.3
51-60	90	15.7
61 and above	74	12.9
Total	573	100.0

Source: own study

When the number of employees of the companies is examined in Table 3, 12.9% of the participants have 50-250 employees, 27.4% have 251-500 employees, 16.4% have 501-750 employees, 9.8% have 751-100 employees and 33.5% have 1001 and above employees.

Table 3. **Number of employees of the companies**

Number of employees	Frequency	Percentage
50-250	74	12.9
251-500	157	27.4
501-750	94	16.4
751-1000	56	9.8
1001 and above	192	33.5
Total	573	100.0

Source: own study

4.2. Descriptive analysis results regarding variables

The descriptive analysis results regarding the scales of digital transformation, adaptive capability, absorptive capacity, innovation capability, financial performance, logistics service performance, innovation performance examined within the scope of the research are given in Table 4.

Table 4. **Descriptive analysis results regarding scales**

Scale	Number of items	Lowest score	Highest score	$\overline{X}$	ss	$\overline{X}$ /k
Digital transformation	12	36.00	60.00	50.85	5.01	4.24
Adaptive capability	13	40.00	65.00	55.81	5.92	4.29
Absorptive capacity	14	43.00	70.00	60.69	6.76	4.33
Innovation capability	6	18.00	30.00	24.93	2.66	4.16
Financial performance	3	9.00	15.00	12.96	1.72	4.32
Logistics service performance	4	12.00	20.00	17.37	2.06	4.34
Innovation performance	4	12.00	20.00	16.84	1.9	4.21

Source: own study

It is observed that the average of the digital transformation scale scores of the companies is 50.85 (4.24 out of 5), the average of the adaptive capability scale scores is 55.81 (4.29 out of 5), the average of the absorptive capacity scale scores is 60.69 (4.33 out of 5), the average of the innovation capability scale scores is 24.93 (4.16 out of 5), the average of the financial performance scale scores is 12.96 (4.32 out of 5), the average of the logistics service performance scale scores is 17.37 (4.34 out of 5), the average of the innovation performance scale scores is 16.84 (4.21 out of 5). In this context, it can be said that the companies' scores on the scales are generally high.

4.3. Reliability and validity analysis results

The reliability of the scale was determined using the Cronbach alpha method. The calculated reliability coefficients are above 0.60 as shown in Table 5. Accordingly, the scale reliabilities exceed the threshold recommended by Büyüköztürk (2010) and it can be said that the scales are reliable.

Table 5. **Reliability and validity analysis results**

Factors	Alpha
Digital transformation	.83
Adaptive capability	.88
Absorptive capacity	.92
Innovation capability	.62
Financial performance	.85
Logistics service performance	.79
Innovation performance	.77

Source: own study

4.4. Relations between variables

Pearson correlation coefficients were analysed to identify the relationships among the variables included in the study. The corresponding results are presented in Table 6.

Table 6. **Correlations between variables**

Factors		Digital Transformation	Adaptive Capability	Absorptive Capacity	Innovation Capability	Financial Performance	Logistics Service Performance	Innovation Performance
Digital transformation	r	-						
Adaptive capability	r	.842**	-					
Absorptive capacity	r	.869**	.860**	-				
Innovation capability	r	-.030	.004	.022	-			
Financial performance	r	-.040	.029	.024	.288**	-		
Logistics service performance	r	.410**	.400**	.438**	-.010	.033	-	
Innovation performance	r	.269**	.318**	.317**	.187**	.658**	.203**	-

** The correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Source: own study

When the results in Table 6 are examined, it is determined that there is a high positive relationship between digital transformation and adaptive capability (r=.842, p<.01), digital transformation and absorptive capacity (r=.869, p<.01), adaptive capability and absorptive capacity (r=.860, p<.01), innovation performance and financial performance (r=.658, p<.01) (Pallant, 2005).

On the other hand, it was determined that there is a positive medium level relationship between logistics service performance and digital transformation (r=.410, p<.01), logistics service performance and adaptive capability (r=.400, p<.01), logistics service performance and absorptive capacity (r=.438, p<.01), innovation performance and adaptive capability (r=.318, p<.01), innovation performance and absorptive capacity (r=.317, p<.01) (Pallant, 2005).

It was determined that there is a positive but low-level relationship between financial performance and innovation capability (r=.288, p<.01), innovation performance and digital transformation (r=.269, p<.01), innovation performance and innovation capability (r=.187, p<.01), innovation performance and logistics service performance (r=.203, p<.01) (Pallant, 2005).

4.5. Structural equation modelling results

All items were retained during confirmatory factor analysis (CFA), and no indicator required removal. Factor loadings consistently exhibited strong magnitudes across all constructs, with all values exceeding the commonly accepted threshold of .60, indicating adequate indicator reliability. Internal consistency and convergent validity were supported, as the reliability coefficients reported in Table 5 (α ranging from .62 to .92) and the descriptive properties of the scales (Table 4) demonstrated acceptable psychometric performance.

Table 7. **Goodness of Fit Index Values in structural equation model for Model 1**

	Model value	Perfect fit	Acceptable fit
	10.519	$0 \leq \chi^2/df \leq 3$	$3 < \chi^2/df \leq 5$
CFI	.878	.95 ≤ CFI ≤ 1	.90 ≤ CFI < .95
GFI	.88	.95 ≤ GFI ≤ 1	.90 ≤ GFI<.95
AGFI	.82	.90 ≤ AGFI ≤ 1.00	.85 ≤ AGFI <.90
IFI	.88	.95 ≤ IFI ≤ 1	.90 ≤ IFI <.95
TLI	.85	.95 ≤ TLI ≤1	.90 ≤ TLI <.95
RMSEA	.129	.00 ≤ RMSEA ≤ .05	.05< RMSEA ≤ .08
SRMR	.0952	.00 ≤ SRMR ≤ .05	.05< SRMR ≤ .10

Source: own study

The initial measurement model (Model 1) presented suboptimal fit, as reflected by CFI = .878, TLI = .85, GFI = .88, RMSEA = .129, and SRMR = .0952 (Table 7). These indices fall outside accepted ranges, suggesting the need for model respecification. The structure of Model 1 revealed by structural equation modeling is given in Figure 2.

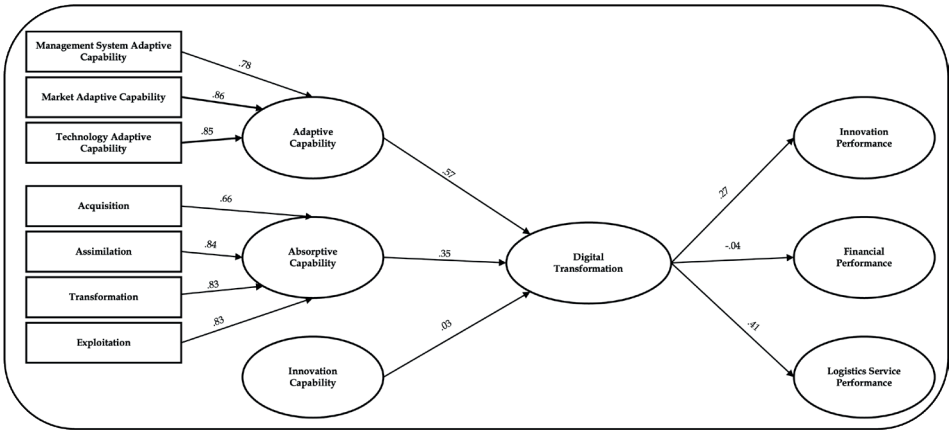

Figure 2. **Structural relationships relating to Model 1**

Source: own study

Following model refinement, the structural model (Model 2) demonstrated a substantially improved and acceptable fit to the data. Fit indices indicated strong model adequacy (χ^2/df = 2.876; CFI = .98; TLI = .98; GFI = .97; AGFI = .95; RMSEA = .057; SRMR = .0414), all of which fall within recommended thresholds (Table 8). The structure of Model 2 revealed by structural equation modeling is given in Figure 3.

Table 8. **Goodness of Fit Index Values in structural equation model for Model 2**

	Model value	Perfect fit	Acceptable fit
X^2/df	2.876	$0 \leq \chi^2/df \leq 3$	$3 < \chi^2/df \leq 5$
CFI	.98	.95 ≤ CFI ≤ 1	.90 ≤ CFI < .95
GFI	.97	.95 ≤ GFI ≤ 1	.90 ≤ GFI<.95
AGFI	.95	.90 ≤ AGFI ≤ 1.00	.85 ≤ AGFI <.90
IFI	.98	.95 ≤ IFI ≤ 1	.90 ≤ IFI <.95
TLI	.98	.95 ≤ TLI ≤1	.90 ≤ TLI <.95
RMSEA	.057	.00 ≤ RMSEA ≤ .05	.05< RMSEA ≤ .08
SRMR	.0414	.00 ≤ SRMR ≤ .05	.05< SRMR ≤ .10

Source: own study

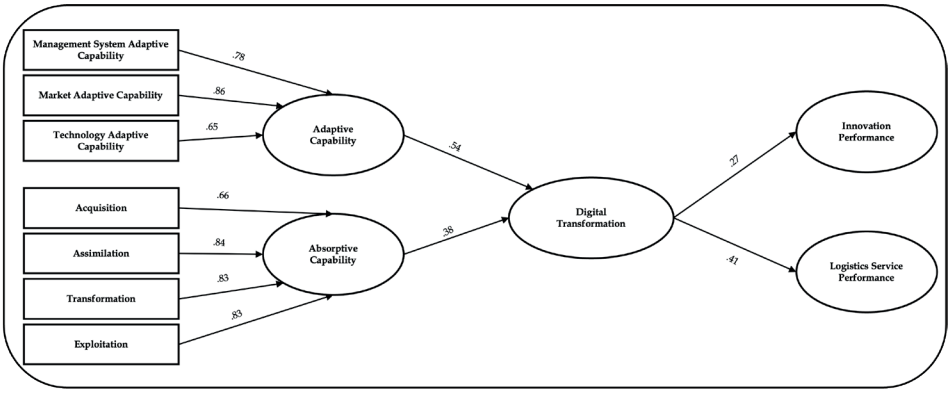

Figure 3. **Structural relationships for Model 2**

Source: own study

The results reveal that adaptive capability (H1) and absorptive capacity (H2) exert significant positive effects on digital transformation, whereas innovation capability does not exhibit a significant impact (H3). Digital transformation, in turn, significantly enhances innovation performance (H4) and logistics service performance (H6), while its effect on financial performance (H5) is not statistically supported (Table 9).

Table 9. **Status of support for hypotheses within the scope of the research**

Hypotheses	Direction of effect	Hypothesis acceptance status
H_1	Adaptive capability digital transformation	Yes
H_2	Absorptive capacity digital transformation	Yes
H_3	Innovation capability digital transformation	No
H_4	Digital transformation innovation performance	Yes
H_5	Digital transformation financial performance	No
H_6	Digital transformation logistics service performance	Yes

Source: own study

Taken together, these findings suggest that digital transformation serves as a strategic capability that has a more significant impact on firms' innovation and service-level outcomes compared to short-term financial metrics.

5. Discussion

Digital transformation significantly affects companies' products and processes. Digital technologies create new opportunities for firms to enhance efficiency. In the logistics sector, they significantly improve efficiency, quality, and performance. With globalization, outsourcing, and technological advances, the sector has evolved from providing basic transport or storage to offering complex logistics solutions such as 3PL and 4PL services (Cichosz et al., 2020).

The main objective of this study is two-fold: to identify the factors driving digital transformation within logistics firms and to assess the ultimate impact on organizational performance. To accomplish this, the research first evaluates the sector's perspective on digitalization, encompassing current strategies, initiatives, and internal practices. Secondly, the study aims to delineate the principal enablers and barriers associated with the transformation process. Third, it analyses the extent to which dynamic capabilities influence the firm's level of digitalization. Finally, the research concludes by investigating how digitalization affects firm performance across innovation, financial metrics, and logistics service efficacy.

The analysis initially focused on the impact of dynamic capabilities on digitalization. Defined as a firm's propensity to integrate, renew, and reorganize resources for sustaining competitiveness in volatile environments (Wang & Ahmed, 2007), these capabilities showed clear influence. Specifically, adaptive capability, a core dimension of this framework, exhibited a significant positive effect on digitalization, aligning with existing literature (Huang et al., 2023; Taufani & Widjaja, 2022).

Strengthening adaptability can thus enhance digital transformation among logistics service providers.

Absorptive capacity, the second dimension of dynamic capabilities, also positively and significantly influences firms' digitalization levels, consistent with previous research (Huang et al., 2023). Yang and Yee (2022) argue that absorptive capacity can enhance the effectiveness of process digitalization initiatives. Vigren et al. (2022) also emphasize that absorptive capacity plays a significant role in digitalization. In a similar vein, Abourokbah et al. (2023) found that absorptive capacity has a positive effect on firms' digitalization capabilities.

The final dimension, innovation capability, showed no significant effect on firms' digitalization levels. The findings differ from the results of previous studies. Nasiri et al. (2023) determined that innovation capabilities did not affect digitalization in business processes. Taufani and Widjaja (2022) found that innovation capability positively

influences digital transformation under technological turbulence. Other studies suggest that digitalization affects innovation capability (Arias-Pérez et al., 2021; Sánchez Ramírez et al., 2022). Overall, research shows varying results regarding the relationship between innovation capability and digitalization. When the innovation capability score averages are examined, it is seen that the firms have high scores. Companies providing logistics services obtain technologies related to digitalization by using external sources instead of producing them themselves. Therefore, the innovation capability of these firms may not have affected the digitalization levels of the firms.

The rejection of H3 indicates that innovation capability functions as an outcome rather than a driver of digital transformation in the Turkish logistics sector. Large logistics service providers typically acquire digital solutions from external vendors rather than developing them internally, which weakens the strategic importance of internal innovation routines during the early phases of transformation. This structural pattern aligns with the characteristics of emerging markets, where innovation tends to follow digital adoption rather than initiate it.

Although this study was conducted within the context of Türkiye, several mechanisms identified align with findings from studies in Western and Asian economies, particularly regarding the strong influence of adaptive and absorptive capabilities on digital transformation. However, the non-significant role of innovative capability and the relatively weak effect of digital transformation on financial performance appear to be shaped by Türkiye's unique sectoral structure. The Turkish logistics market is highly fragmented, dominated by numerous small and medium-sized providers with heterogeneous technological maturity and limited innovation capacity. This fragmented landscape, combined with institutional volatility and competitive cost pressures, constrains firms' ability to translate digital initiatives into radical innovation or short-term financial gains. These contextual characteristics imply that while the overall DC → DT → Performance framework may hold in other settings, the capability–performance relationships observed in this study may operate differently in countries with more consolidated or technologically mature logistics industries.

When compared to findings from Western European and North American economies, where innovation capability consistently emerges as a primary driver of digital transformation, the results of this study diverge significantly. In contrast, studies conducted in other emerging economies such as Indonesia, India and Vietnam similarly report weaker or inconsistent effects of innovation capability. This suggests that the DC → DT → Performance chain operates differently across economic contexts, and that structural factors characteristic of emerging markets, such as resource constraints, fragmented competition, and reliance on external technologies, shape the pathways through which dynamic capabilities influence digital transformation.

All dimensions of dynamic capabilities, except innovation capability, significantly affect the digitalization levels of logistics service providers. In digitalization, these capabilities help firms integrate and reconfigure competencies to adapt to transformation (Ellström et al., 2021). In dynamic markets, they also support sustaining competitive advantage during digital transformation (Lei et al., 2021). Thus, firms with stronger dynamic capabilities are better equipped to manage its challenges and opportunities.

The study examined how digitalization affects logistics service, innovation, and financial performance. Findings show that digitalization is a key determinant of logistics service performance, positively influencing it (Taufani & Widjaja, 2022; Li et al., 2022a; Zhou et al., 2023). Firms with more advanced and intensive digital logistics activities achieve higher logistics performance (Lai et al., 2010). Enhancing service quality through digitalization also strengthens competitiveness (Li et al., 2022a).

The analysis showed that digitalization level significantly influences innovation performance, consistent with previous studies (Chen, 2022; Chen & Kim, 2023; Li & Wan, 2022). However, some research presents differing results. Kastelli et al. (2024) found that digital capacity affects innovation performance indirectly through absorptive capacity, while Usai et al. (2021) reported only a weak link between digital technologies and radical innovation.

The direct relationship between the level of digitalization and firms' financial performance was found to be statistically insignificant in this study, aligning with the conclusions of Nasiri et al. (2022). Conversely, a substantial body of research indicates positive correlations between digitalization and overall firm performance (Wang et al., 2020; Eller et al., 2020; Fernández Portillo et al., 2022; Zhou et al., 2023). Furthermore, the literature reveals complexity in this association; for instance, supply chain digitalization specifically improves performance (Chatterjee et al., 2023), whereas Yu et al. (2023) uncovered an inverted U-shaped correlation between digitalization and performance outcomes. Nasiri et al. (2022) argued that digitalization affects performance indirectly through digital maturity and intensity, whereas Jardak and Ben Hamad (2022) found a negative relationship. Overall, findings are mixed, suggesting that intermediary factors, such as customer satisfaction and service quality improvements through digitalization, may influence firm performance, supported by the high average financial performance score observed.

Digital transformation and the new technologies it bring deeply affect all sectors. This change has become an inevitable necessity for logistics companies with the rapid advancement of technology. For this reason, it is important for companies to think strategically about digitalization and to adapt their structures and cultural environments accordingly. Because Industry 4.0 has initiated a major change in the logistics sector by calling on supply chain members to reshape their processes with digital transformation. Due to this change, logistics service providers should closely follow the digital

transformation in the sector, increase their knowledge levels and transform their own processes.

The findings provide valuable theoretical insights into digital transformation and dynamic capabilities in the logistics sector. By demonstrating the distinct roles of adaptive capability and absorptive capacity in driving digitalization, while identifying the lack of significant influence from innovation capability, the study offers a nuanced perspective that challenges existing assumptions in the dynamic capabilities literature. The study also links digital transformation to logistics service, financial, and innovation performance, bridging the gap between digitalization and firm outcomes. These insights clarify the mixed findings in prior research and underscore the importance of sector-specific analyses in understanding digital transformation. Additionally, the study enriches the discourse on performance metrics by distinguishing between logistics service, innovation, and financial outcomes, emphasizing the need for granular approaches in performance evaluation. By contextualizing the reliance of logistics firms on external resources for digitalization, this research extends the application of dynamic capabilities theory, offering valuable insights into how industry-specific dynamics shape digital transformation and its outcomes.

The findings also provide important practical implications for managers and policymakers in the logistics sector. The significant effects of adaptive capability and absorptive capacity indicate that firms should prioritise investments that enhance organisational flexibility and the ability to acquire and utilise external knowledge. For logistics firms in Türkiye, where market conditions are volatile and customer expectations change rapidly, strengthening these capabilities helps firms respond more effectively to operational disruptions and technological shifts. Managers can accelerate this process by improving coordination between departments, encouraging data-driven decision-making, and engaging more actively with external partners such as technology providers and customers.

The non-significant role of innovation capability indicates that innovation routines in the Turkish logistics sector may not yet be sufficiently embedded to generate direct momentum for digital transformation. Firms should therefore focus on the governance side of innovation. This includes setting clear innovation objectives, ensuring managerial oversight, and aligning innovation activities with short-term operational priorities. In environments where financial and operational resources are limited, this alignment prevents the misallocation of budgets and protects firms from project failures.

The positive effects of digital transformation on innovation performance and logistics service performance indicate that technology-driven improvements initially manifest in customer-related outcomes and operational reliability. These results underline the importance for managers to adopt a long-term view. Digital investments are unlikely to generate immediate financial benefits in asset heavy

logistics operations. However, they improve service levels, reduce errors, and strengthen customer relationships. These outcomes translate into financial gains only after firms achieve stability in their service processes. Managers should therefore monitor operational indicators closely and integrate customer satisfaction metrics into their digital strategy roadmap.

The absence of a direct link between digital transformation and financial performance suggests that logistics firms should not evaluate digital initiatives solely on the basis of short-term profitability. Instead, they should focus on the indirect channels through which financial value emerges, such as improved service quality, increased customer retention, and enhanced innovation outputs. This approach allows firms to set realistic expectations and prevents premature abandonment of digital projects.

Finally, the results have meaningful implications for policymakers and industry leaders. Since adaptive and absorptive capacities play a central role in digital transformation, targeted programmes that improve managerial skills, knowledge sharing, and inter-organizational collaboration can support sector-wide transformation. The finding that firms rely heavily on external resources for digitalisation also highlights the need for stronger partnerships between logistics companies and technology developers. Industry associations can support this process by creating shared digital platforms, organising training programmes, and facilitating joint pilot projects. These steps can reduce the financial burden on individual firms and promote a more balanced digital transformation across the sector.

This study has several limitations that should be taken into account when interpreting the findings. First, the use of purposive sampling and the higher representation of medium and large firms restricts the generalisability of the results. Although the Turkish logistics sector is dominated by small and micro enterprises, the sample primarily reflects firms with more advanced organisational structures and greater technological capacity. Future studies should incorporate a more balanced sample, especially SMEs, to better capture the sector's diversity. This is particularly important because dynamic capabilities operate differently in resource-constrained SMEs, where sensing, learning, and absorptive routines tend to be structurally weaker. Therefore, the DC → DT → Performance relationships identified in this study should not be assumed to apply to smaller firms without further empirical validation.

Second, the data were collected through a cross-sectional survey, which limits the ability to infer causality. Longitudinal research designs would enable a deeper understanding of how dynamic capabilities and digital transformation evolve over time, particularly in environments characterized by rapid technological change.

Third, the study relies on self-reported measures, which may introduce common method variance and social desirability bias. Future work could integrate objective indicators such as operational performance data, digital usage metrics, or financial records to strengthen measurement accuracy and reduce potential bias.

Fourth, future research should also prioritise comparative analyses, such as multi-group models comparing large Turkish logistics service providers with SMEs or cross-country comparisons between Türkiye and Western European economies. Such approaches would help determine which elements of the DC → DT → Performance chain are unique to emerging markets and which represent broader global patterns.

6. Conclusion

This study contributes to the digital transformation literature by showing that adaptive capability and absorptive capacity are the most influential dynamic capabilities in shaping digitalisation outcomes in the Turkish logistics sector. Unlike studies conducted in more digitally mature economies, innovation capability did not directly support digital transformation, indicating that innovation routines may require a stronger organisational foundation in developing markets.

The findings also highlight important managerial implications. Firms should prioritise capability development and knowledge-based processes before expecting measurable financial results from digital investments. Improvements in service quality and innovation performance appear earlier than financial gains, suggesting that managers need a long-term strategy for digital transformation.

Methodologically, the study provides evidence from an understudied national context and offers a validated structural model that can be applied or extended by future researchers. Given the fragmented and highly competitive nature of the Turkish logistics industry, the results offer a useful framework for identifying which organisational capabilities should be strengthened during digital transformation processes.

Future research could expand this work by incorporating longitudinal data, objective performance indicators, and comparative studies across countries. Such extensions would help clarify how different market conditions influence the role of dynamic capabilities in digital transformation. Overall, the study offers a balanced understanding of how logistics firms in developing economies can navigate the complexities of digital transformation and build more resilient organisational structures.

Authors' contribution

S.Ç., H.K., Y.E.T.: article conception, theoretical content of the article, research methods applied, conducting the research, data collection, analysis and interpretation of results, draft manuscript preparation. **R.Y.:** conducting the research, analysis and interpretation of results, draft manuscript preparation.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used Chat GPT-5 for proofreading the translation. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

Acknowledgments

This study was supported by Scientific and Technological Research Council of Türkiye (TUBITAK) under Grant Number 122G042.

References

Abdurrahman, A., Gustomo, A., & Prasetio, E. A. (2023). Enhancing banking performance through dynamic digital transformation capabilities and governance, risk management, and compliance: insights from the Indonesian context. *The Electronic Journal of Information Systems in Developing Countries*, 90(2), e12299. https://doi.org/10.1002/isd2.12299

Abiodun, T., Rampersad, G., & Brinkworth, R. S. A. (2023). Driving smartness for organizational performance through industry 4.0: a systems perspective. *Journal of Manufacturing Technology Management,* 34(9), 40-63. https://doi.org/10.1108/jmtm-09-2022-0335

Abou-Foul, M., Ruiz-Alba, J. L., & Soares, A. (2021). The impact of digitalization and servitization on the financial performance of a firm: an empirical analysis. *Production Planning & Control*, 32(12), 975-989. https://doi.org/10.1080/09537287.2020.1780508

Abourokbah, S. H., Mashat, R. M., & Salam, M. A. (2023). Role of absorptive capacity, digital capability, agility, and resilience in supply chain innovation performance. *Sustainability*, 15(4), 3636. https://doi.org/10.3390/su15043636

Agarwal, R., Gao, G., DesRoches, C. & Jha, A. (2010). The digital transformation of healthcare: Current status and the road ahead. *Information Systems Research*, 21, 796–809. https://doi.org/10.1287/isre.1100.0327

Akgün, A. E., Keskin, H. & Byrne, J. (2012). Antecedents and contingent effects of organizational adaptive capability on firm product innovativeness. *Journal of Product Innovation Management*, 29, 171–189. https://doi.org/10.1111/j.1540-5885.2012.00949.x

Alrawadieh, Z., Alrawadıeh, Z., & Çetin, G. (2020). Digital transformation and revenue management: evidence from the hotel industry. *Tourism Economics*, 27(2), 328-345. https://doi.org/10.1177/1354816620901928

Ambrosini, V., & Bowman, C. (2009). What are dynamic capabilities and are they a useful construct in strategic management? *International Journal of Management Reviews*, 11(1), 29–49. https://doi.org/10.1111/j.1468-2370.2008.00251.x

Annarelli, A., Battistella, C., Nonino, F., Parida, V., & Pessot, E. (2021). Literature review on digitalization capabilities: Co-citation analysis of antecedents, conceptualization and

consequences. *Technological Forecasting and Social Change*, 166, 120635. https://doi.org/10.1016/j.techfore.2021.120635

Antonucci, Y. L., Fortune, A., & Kirchmer, M. (2021). An examination of associations between business process management capabilities and the benefits of digitalization: all capabilities are not equal. *Business Process Management Journal*, *27*(1), 124-144. https://doi.org/10.1108/BPMJ-02-2020-0079

Arias-Pérez, J., Velez-Ocampo, J., & Cepeda-Cardona, J. (2021). Strategic orientation toward digitalization to improve innovation capability: why knowledge acquisition and exploitation through external embeddedness matter. *Journal of Knowledge Management*, 25(5), 1319-1335. https://doi.org/10.1108/JKM-03-2020-0231

Bektaş, O., Erdemir, E., & Sayılar, Y. (2022). The Evolution of the Dynamic Capabilities Framework in Strategic Management Literature: A Systematic Literature Review (Dinamik Yetenekler Çerçevesinin Stratejik Yönetim Literatüründeki Gelişimi: Sistematik Literatür Taraması). *International Journal of Social Inquiry*, 15(2), 493-538. https://doi.org/10.37093/ijsi.1163120

Calik, E. & Calisir, F. (2019). The mediating effect of the innovation process on the relationships among innovation components: an empirical study on Turkish companies. *International Journal of Technology Policy and Management*, 19(1), 72-88. https://doi.org/10.1504/ijtpm.2019.10019335

Caloghirou, Y., Kastelli, I. & Tsakanikas, A. (2004). Internal capabilities and external knowledge sources: Complements or substitutes for innovative performance? *Technovation*, 24(1), 29–39. https://doi.org/10.1016/S0166-4972(02)00051-2

Camio, M., Romero, M., Álvarez, M., & Rébori, A. (2018). Distinctive innovation capabilities of Argentine software companies with high innovation results and impacts. *Administrative Sciences*, 8(2), 13. https://doi.org/10.3390/admsci8020013

Cepeda-Carrión, G. & Vera, D. (2007). Dynamic capabilities and operational capabilities: a knowledge management perspective. *Journal of Business Research*, 60(5), 426-437. https://doi.org/10.1016/j.jbusres.2007.01.013

Chatterjee, S., Mariani, M., & Ferraris, A. (2023). Digitalization of supply chain and its impact on cost, firm performance, and resilience: technology turbulence and top management commitment as moderator. *IEEE Transactions on Engineering Management*, 71, 10469-10484. https://doi.org/10.1109/TEM.2023.3297251

Chen, H. (2022). The Influence of Digital Transformation on Technological Innovation Performance of Automobile Manufacturing Enterprises. *Industrial Engineering and innovation Management,* 5(3), 70-75. https://doi.org/10.23977/ieim.2022.050310

Chen, P., & Kim, S. (2023). The impact of digital transformation on innovation performance-The mediating role of innovation factors. *Heliyon,* 9(3), e13916. https://doi.org/10.1016/j.heliyon.2023.e13916

Cichosz, M., Wallenburg, C. M. & Knemeyer, A. M. (2020). Digital transformation at logistics service providers: barriers, success factors and leading practices. *International Journal of Logistics Management,* 31(2), 209–238. https://doi.org/10.1108/IJLM-08-2019-0229

Coronado-Medina, A., Arias-Pérez, J., & Perdomo-Charry, G. (2020). Fostering product innovation through digital transformation and absorptive capacity. *International Journal of Innovation and Technology Management,* 17(6), 1–23. https://doi.org/10.1142/S0219877020500406

Coşkun, Ö. F. & Özyılmaz. A. (2016). Sürdürülebilir rekabet avantajının temel yetenekler ve dinamik kabiliyetler açısından değerlendirmesi. [Assessment of sustainable competitive advantage in

terms of core competencies and dynamic capabilities]. *Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi*, 30(4), 725-750.

Daradkeh, F., Hassan, T., Palei, T., Helal, M., Mabrouk, S., Saleh, M., & Elshawarbi, N. (2023). Enhancing digital presence for maximizing customer value in fast-food restaurants. *Sustainability*, 15(7), 5690. https://doi.org/10.3390/su15075690

Demeter, K., Losonci, D., & Nagy, J. (2021). Road to digital manufacturing–a longitudinal case-based analysis. *Journal of Manufacturing Technology Management*, 32(3), 820-839. https://doi.org/10.1108/JMTM-06-2019-0226

Demirkan, H., Spohrer, J. C., & Welser, J. J. (2016). Digital innovation and strategic transformation. *It Professional*, 18(6), 14-18. https://doi.org/10.1109/MITP.2016.115

Dodgson, M., Gann, D., & Salter, A. (2008). *The management of technological innovation: strategy and practice (2 ed.)*. Oxford.

Dwipayana, C., Prijadi, R., & Hamsal, M. (2021). Bifurcating the dynamic dominant logic: technical and evolutionary patterns of action. *Management Decision*, 60(7), 1813-1851. https://doi.org/10.1108/md-02-2021-0207

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10-11), 1105–1121. https://doi.org/10.1002/1097-0266(200010/11)21:10/11%3C1105::AID-SMJ133%3E3.0.CO;2-E

Eller, R., Alford, P., Kallmünzer, A., & Peters, M. (2020). Antecedents, consequences, and challenges of small and medium-sized enterprise digitalization. *Journal of Business Research*, 112, 119-127. https://doi.org/10.1016/j.jbusres.2020.03.004

Ellonen, H. K., Wikstrm, P., & Jantunen, A. (2009). Linking dynamic-capability portfolios and innovation outcomes. *Technovation*, 29(11),753–762. https://doi.org/10.1016/j.technovation.2009.04.005

Ellström, D., Holtström, J., Berg, E., & Josefsson, C. (2021). Dynamic capabilities for digital transformation. *Journal of Strategy and Management*, 15(2), 272-286. https://doi.org/10.1108/jsma-04-2021-0089

Enkel, E., & Sagmeister, V. (2020). External corporate venturing modes asnew way to develop dynamic capabilities. *Technovation*, 96–97,102128. https://doi.org/10.1016/j.technovation.2020.102128

Fernández-Portillo, A., Almodóvar-González, M., Sánchez-Escobedo, M. C., & Coca-Pérez, J. L. (2022). The role of innovation in the relationship between digitalisation and economic and financial performance. A company-level research. *European Research on Management and Business Economics,* 28(3), 100190. https://doi.org/10.1016/j.iedeen.2021.100190

Fitzgerald, M., Kruschwitz, N., Bonnet, D., & Welch, M. (2014). Embracing digital technology: A new strategic imperative. *MIT Sloan Management Review*, 55(2), 1,16.

Flatten, T. C., Engelen, A., Zahra, S. A. & Brettel, M. (2011). A measure of absorptive capacity: Scale development and validation. *European Management Journal*, 29(2), 98–116. https://doi.org/10.1016/j.emj.2010.11.002

Gaglio, C., Kraemer-Mbula, E., & Lorenz, E. (2022). The effects of digital transformation on innovation and productivity: Firm-level evidence of South African manufacturing micro and small enterprises. *Technological Forecasting and Social Change*, 182, 121785. https://doi.org/10.1016/j.techfore.2022.121785

Govindarajan V. & Immelt JR. (2019). The only way manufacturers can survive. *MIT Sloan Management Review,* 60(3), 24–33.

Hajiheydari, N., Shouraki, M., Vares, H., & Mohammadian, A. (2022). Digital sustainable business model innovation: applying dynamic capabilities approach (DSBMI-DC). *Foresight,* 25(3), 420-447. https://doi.org/10.1108/fs-02-2022-0012

Hanelt, A., Bohnsack, R., Marz, D., & Antunes Marante, C. (2021). A systematic review of the literature on digital transformation: Insights and implications for strategy and organizational change. *Journal of management studies*, 58(5), 1159-1197. https://doi.org/10.1111/joms.12639

Hauke-Lopes, A., Ratajczak-Mrozek, M., & Wieczerzycki, M. (2022). Value co-creation and co-destruction in the digital transformation of highly traditional companies. *Journal of Business and Industrial Marketing*, 38(6), 1316-1331. https://doi.org/10.1108/jbim-10-2021-0474

Herold, D., Nowicka, K., Pluta-Zaremba, A., & Kummer, S. (2021). Covid-19 and the pursuit of supply chain resilience: reactions and "lessons learned" from logistics service providers (LSP). *Supply Chain Management an International Journal*, 26(6), 702-714. https://doi.org/10.1108/scm-09-2020-0439

Hofmann, E. & Osterwalder, F. (2017). Third-party logistics providers in the digital age: towards a new competitive arena?. *Logistics,* 1(2), 9. https://doi.org/10.3390/logistics1020009

Hsiao, H. I., Kemp, R. G. M., van der Vorst, J. G. A. J. & Omta, S. W. F. (2010). A classification of logistic outsourcing levels and their impact on service performance: Evidence from the food processing industry. *International Journal of Production Economics*, 124(1), 75–86. https://doi.org/10.1016/j.ijpe.2009.09.010

Huang, J. Y. H., Jiang, R., & Chang, J. Y. T. (2023). The Effects of Transformational and Adaptive Leadership on Dynamic Capabilities: Digital Transformation Projects. *Project Management Journal*, 54(4), 428-446. https://doi.org/10.1177/87569728231165896

Jardak, M. K., & Ben Hamad, S. (2022). The effect of digital transformation on firm performance: evidence from Swedish listed companies. *The Journal of Risk Finance*, 23(4), 329-348. https://doi.org/10.1108/JRF-12-2021-0199

Ji, H., Miao, Z., Wan, J., & Liu, L. (2022). Digital transformation and financial performance: the moderating role of entrepreneurs' social capital. *Technology Analysis and Strategic Management*, 1-18. https://doi.org/10.1080/09537325.2022.2118110

Jiménez-Jiménez, D. & Sanz-Valle, R. (2011). Innovation, organizational learning, and performance. *Journal of Business Research*, 64(4), 408–417. https://doi.org/10.1016/j.jbusres.2010.09.010

Jones, M. D., Hutcheson, S., & Camba, J. D. (2021). Past, present, and future barriers to digital transformation in manufacturing: A review. *Journal of Manufacturing Systems*, 60, 936-948. https://doi.org/10.1016/j.jmsy.2021.03.006

Kalkınma Bakanlığı. (2018). Lojistik hizmetlerin geliştirilmesi özel ihtisas raporu. [Special expert report on the development of logistics services]. https://www.sbb.gov.tr/wp-content/uploads/2020/04/LojistikHizmetlerininGelistirilmesiOzelIhtisasKomisyonuRaporu.pdf

Kastelli, I., Dimas, P., Stamopoulos, D., & Tsakanikas, A. (2024). Linking digital capacity to innovation performance: The mediating role of absorptive capacity. *Journal of the Knowledge Economy*, *15*(1), 238-272. https://doi.org/10.1007/s13132-022-01092-w

Kim, L. (1997). The dynamics of Samsung's technological learning in Semiconductors. *California Management Review*, 39(3), 86–100. https://doi.org/10.2307/41165900

Kuteyi, D. & Winkler, H. (2022). Logistics challenges in sub-Saharan Africa and opportunities for digitalization. *Sustainability*, 14(4), 2399. https://doi.org/10.3390/su14042399

Lai, K. H., Wong, C. W., & Cheng, T. E. (2010). Bundling digitized logistics activities and its performance implications. *Industrial Marketing Management*, 39(2), 273-286. https://doi.org/10.1016/j.indmarman.2008.08.002

Lei, S., Zhang, X., & Liu, H. (2021). Digital technology adoption, digital dynamic capability, and digital transformation performance of textile industry: moderating role of digital innovation orientation. *Managerial and Decision Economics*, 43(6), 2038-2054. https://doi.org/10.1002/mde.3507

Li, C., Feng, W., Han, S., Gupta, S., & Kamble, S. (2022a). Digital adaptive governance, digital transformation, and service quality in logistics enterprises. *Journal of Global Information Management*, 30(1), 1-26. https://doi.org/10.4018/jgim.309377

Li, R., Rao, J., & Wan, L. (2022b). The digital economy, enterprise digital transformation, and enterprise innovation. *Managerial and Decision Economics*, 43(7), 2875-2886. https://doi.org/10.1002/mde.3569

Li, Y. & Fei, G. (2023). Network embeddedness, digital transformation, and enterprise performance—the moderating effect of top managerial cognition. *Frontiers in Psychology*, 14. https://doi.org/10.3389/fpsyg.2023.1098974

Liu, D.Y., Chen, S.W. & Chou, T.C. (2011). Resource fit in digital transformation: Lessons learned from the CBC Bank global e-banking project. *Management Decision,* 49(10). 1728-1742. https://doi.org/10.1108/00251741111183852

Liu, J., Yang, W., & Wan, L. (2021). Adaptive capacity configurations for the digital transformation: a fuzzy-set analysis of Chinese manufacturing firms. *Journal of Organizational Change Management*, 34(6), 1222-1241. https://doi.org/10.1108/jocm-02-2020-0043

Liu, Q., Liu, J., & Gong, C. (2023). Digital transformation and corporate innovation: a factor input perspective. *Managerial and Decision Economics*, 44(4), 2159-2174. https://doi.org/10.1002/mde.3809

Mathauer, M. & Hofmann, E. (2019). Technology adoption by logistics service providers. *International Journal of Physical Distribution & Logistics Management*, 49(4), 416-434. https://doi.org/10.1108/IJPDLM-02-2019-0064

Mowery, D. C., Oxley, J. E. & Silverman, B. S. (1996). Strategic Alliances and Interfirm Knowledge Transfer. *Strategic Management Journal*, 17(1996), 77–91. https://doi.org/10.1002/smj.4250171108

Nadeem, A., Abedin, B., Cerpa, N. & Chew, E. (2018). Editorial: Digital transformation & digital business strategy in electronic commerce - The role of organizational capabilities. *Journal of Theoretical and Applied Electronic Commerce Research*, 13(2), I–VIII. https://doi.org/10.4067/S0718-18762018000200101

Nambisan, S., Lyytinen, K., Majchrzak, A., & Song, M. (2017). Digital innovation management. *MIS quarterly*, 41(1), 223-238.

Nasiri, M., Saunila, M., & Ukko, J. (2022). Digital orientation, digital maturity, and digital intensity: determinants of financial success in digital transformation settings. *International Journal of Operations & Production Management*, 42(13), 274-298. https://doi.org/10.1108/IJOPM-09-2021-0616

Nasiri, M., Saunila, M., Ukko, J., Rantala, T., & Rantanen, H. (2023). Shaping digital innovation via digital-related capabilities. Information Systems Frontiers, 25(3), 1063-1080.

Nikiforov, O., Levkin, G., & Simak, R. (2023). Digital transformation of logistics processes in the transport system - basic trend of the modern world economy. *E3S Web of Conferences*, 381, 02007. https://doi.org/10.1051/e3sconf/202338102007

Nousopoulou, E., Kamariotou, M., & Kitsios, F. (2022). Digital transformation strategy in post-covid era: innovation performance determinants and digital capabilities in driving schools. *Information*, 13(7), 323. https://doi.org/10.3390/info13070323

Pallant, J. (2005). *SPSS survival manual: A step by step guide to data analysis using SPSS for windows*. Allen & Unwin.

Piening, E. & Salge, T. (2014). Understanding the antecedents, contingencies, and performance implications of process innovation: a dynamic capabilities perspective. *Journal of Product Innovation Management*, 32(1), 80-97. https://doi.org/10.1111/jpim.12225

Rangaswamy, U. (2021). Industry 4.0 disruption: assessing the need for adaptive capability. *Development in Learning Organizations an International Journal*, 35(6), 7-10. https://doi.org/10.1108/dlo-01-2021-0003

Rashid, S., & Ratten, V. (2020). A dynamic capabilities approach for the survival of Pakistani family-owned business in the digital world. *Journal of Family Business Management*, 10(4), 373-387. https://doi.org/10.1108/JFBM-12-2019-0082

Raza, Z., Woxenius, J., Vural, C. A., & Lind, M. (2023). Digital transformation of maritime logistics: Exploring trends in the liner shipping segment. *Computers in Industry*, *145*, 103811. https://doi.org/10.1016/j.compind.2022.103811

Ringov, D. (2017). Dynamic capabilities and firm performance. *Long Range Planning*, 50(5), 653–664. https://doi.org/10.1016/j.lrp.2017.02.005

Sağlam, M. (2021). İşletmelerde geleceğin vizyonu olarak dijital dönüşümün gerçekleştirilmesi ve dijital dönüşüm ölçeğinin türkçe uyarlamasi [Digital transformation as a vision for the future of businesses and the Turkish adaptation of the digital transformation scale]. *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 20(40), 395–420. https://doi.org/10.46928/iticusbe.764373

Sánchez Ramírez, S., Guadamillas Gómez, F., González Ramos, M. I., & Grieva, O. (2022). The effect of digitalization on innovation capabilities through the lenses of the knowledge management strategy. *Administrative Sciences*, 12(4), 144. https://doi.org/10.3390/admsci12040144

Savastano, M., Cucari, N., Dentale, F., & Ginsberg, A. (2021). The interplay between digital manufacturing and dynamic capabilities: an empirical examination of direct and indirect effects on firm performance. *Journal of Manufacturing Technology Management*, 33(2), 213-238. https://doi.org/10.1108/jmtm-07-2021-0267

Seggie, S. H., Kim, D. & Cavusgil, S. T. (2006). Do supply chain IT alignment and supply chain interfirm system integration impact upon brand equity and firm performance? *Journal of Business Research*, 59(8), 887–895. https://doi.org/10.1016/j.jbusres.2006.03.005

Shan, H. (2023). Digital Innovation, Dynamic Capabilities and Enterprise Innovation Performance—Empirical Analysis from China's A-Share Listed Companies from 2010-2021. *American Journal of Industrial and Business Management*, *13*(10), 1005-1023. https://doi.org/10.4236/ajibm.2023.1310056

Sousa-Zomer, T. T., Neely, A., & Martinez, V. (2020). Digital transforming capability and performance: a microfoundational perspective. *International Journal of Operations & Production Management*, *40*(7/8), 1095-1128. https://doi.org/10.1108/ijopm-06-2019-0444

Srisathan, W., Ketkaew, C., Jitjak, W., Ngiwphrom, S., & Naruetharadhol, P. (2022). Open innovation as a strategy for collaboration-based business model innovation: the moderating effect among multigenerational entrepreneurs. *Plos One*, 17(6), 1-25. https://doi.org/10.1371/journal.pone.0265025

Stank, T., Goldsby, T., Vickery, S., & Savitskie, K. (2003). Logistics service performance: estimating its influence on market share. *Journal of Business Logistics*, 24(1), 27-55. https://doi.org/10.1002/j.2158-1592.2003.tb00031.x

Szegedi, Z., Ulechla, G., & Miskolczi-Gabriel, M. (2022). Digital transformation in food supply chains in central and Eastern Europe. *International Journal of Economics Business and Management Studies*, 9(2), 171-182. https://doi.org/10.55284/ijebms.v9i2.813

Taiminen, H. & Karjaluoto, H. (2015). The usage of digital marketing channels in SMEs. *Journal of Small Business and Enterprise Development*, 22(4), 633-651. https://doi.org/10.1108/jsbed-05-2013-0073

Taufani, M. & Widjaja, A. W. (2022). Digital transformation for enhancing LSP (logistic service provider) performance. Proceeding of the International Conference on Family *Business and Entrepreneurship*, 2(1). https://doi.org/10.33021/icfbe.v2i1.3518

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, 28(13), 1319–1350. https://doi.org/10.1002/smj.640

Teece, D. J., Pisano, G. & Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18(7), 509-533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7%3C509::AID-SMJ882%3E3.0.CO;2-Z

Theiri, S. & Hadoussa, S. (2023). Digitization effects on banks' financial performance: the case of an African country. *Competitiveness Review*, 34(1), 144-162. https://doi.org/10.1108/cr-10-2022-0147

Thuy, A. & Ngoc, T. (2017). Innovation of the firm: how to create performance from capability. *Journal of Asian Business and Economic Studies*, 24(04), 64-84. https://doi.org/10.24311/jabes/2017.24.4.4

Trang, D., Pham, H., Thalassinos, E., & Le, H. (2022). The impact of digital transformation on performance: evidence from vietnamese commercial banks. *Journal of Risk and Financial Management*, 15(1), 21. https://doi.org/10.3390/jrfm15010021

Usai, A., Fiano, F., Petruzzelli, A. M., Paoloni, P., Briamonte, M. F., & Orlando, B. (2021). Unveiling the impact of the adoption of digital technologies on firms' innovation performance. *Journal of Business Research*, 133, 327-336. https://doi.org/10.1016/j.jbusres.2021.04.035

Vaska, S., Massaro, M., Bagarotto, E., & Mas, F. (2021). The digital transformation of business model innovation: a structured literature review. *Frontiers in Psychology*, 11, 1-18. https://doi.org/10.3389/fpsyg.2020.539363

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems, 28*(2), 118–144. https://doi.org/10.1016/j.jsis.2019.01.003

Vigren, O., Kadefors, A., & Eriksson, K. (2022). Digitalization, innovation capabilities and absorptive capacity in the Swedish real estate ecosystem. *Facilities*, 40(15/16), 89-106. https://doi.org/10.1108/f-07-2020-0083

Wang, C. L. & Ahmed, P. K. (2004). The development and validation of the organisational innovativeness construct using confirmatory factor analysis. *European Journal of Innovation Management*, 7(4), 303–313. https://doi.org/10.1108/14601060410565056

Wang, C. L. & Ahmed, P. K. (2007). Dynamic capabilities: A review and research agenda. *International Journal of Management Reviews*, 9(1), 31–51. https://doi.org/10.1111/j.1468-2370.2007.00201.x

Wang, D. & Chen, S. (2013). Does intellectual capital matter? high-performance work systems and bilateral innovative capabilities. *International Journal of Manpower*, 34(8), 861-879. https://doi.org/10.1108/ijm-07-2013-0167

Wang, H., Feng, J., Zhang, H. & Li, X.J. (2020). The effect of Digital Transformation Strategy on Performance: The Moderating Role of Cognitive Conflict. *International Journal of Conflict Management*, 31(3), 441-462. https://doi.org/10.1108/IJCMA-09-2019-0166

Wang, S., Ghadge, A., & Aktas, E. (2024). Digital transformation in food supply chains: an implementation framework. *Supply Chain Management: An International Journal*, 29(2), 328-350. https://doi.org/10.1108/scm-09-2023-0463

Wang, S., Li, X., Li, Z., & Ye, Y. (2023). The effects of government support on enterprises' digital transformation: evidence from China. *Managerial and Decision Economics*, 44(5), 2520-2539. https://doi.org/10.1002/mde.3831

Warner, K.S.R. & Wäger, M. (2019). Building dynamic capabilities for digital transformation: an ongoing process of strategic renewal. *Long Range Planning*, 52(3), 326-349. https://doi.org/10.1016/j.lrp.2018.12.001

Wilden, R., Gudergan, S. P., Nielsen, B. B. & Lings, I. (2013). Dynamic Capabilities and Performance: Strategy, Structure and Environment, *Long Range Planning*, 46(1/2), 72-96. https://doi.org/10.1016/j.lrp.2012.12.001

Wu, W., Wang, H., Lu, L., Ma, G., & Gao, X. (2023). How firms cope with social crisis: the mediating role of digital transformation as a strategic response to the covid-19 pandemic. *Plos One*, 18(4), e0282854. https://doi.org/10.1371/journal.pone.0282854

Yang, C. (2016). Leveraging logistics learning capability to enable logistics service capabilities and performance for international distribution center operators in taiwan. The *International Journal of Logistics Management*, 27(2), 284-308. https://doi.org/10.1108/ijlm-09-2014-0157

Yang, Y., & Yee, R. W. (2022). The effect of process digitalization initiative on firm performance: A dynamic capability development perspective. *International Journal of Production Economics,* 254, 108654. https://doi.org/10.1016/j.ijpe.2022.108654

Yıldız, B. & Çiğdem, Ş. (2022). Digital transformation in logistics: lights-out logistics. *Financial and Economic Issues in Emerging Markets*, 343-366. https://doi.org/10.58830/ozgur.pub1.c41

Yu, F., Zhang, Q., & Jiang, D. (2023). The impact of regional environmental regulations on digital transformation of energy companies: the moderating role of the top management team. *Managerial and Decision Economics*, 44(6), 3152-3165. https://doi.org/10.1002/mde.3868

Zhou, H., Wang, Q., Wang, L., Zhao, X. & Feng, G. (2023). Digitalization and third-party logistics performance: Exploring the roles of customer collaboration and government support. *International Journal of Physical Distribution & Logistics Management*, 53(4), 467-488. https://doi.org/10.1108/IJPDLM-12-2021-0532

Zott, C. (2003). Dynamic capabilities and the emergence of intraindustry differential firm performance: Insights from a simulation study. *Strategic Management Journal*, 24(2), 97–125. https://doi.org/10.1002/smj.288