Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

JOURNAL ECONOMICS BUSINESS

Development *of E-Logistics* in Expedition Services During the Covid-19 Pandemic: A Qualitative Study

Zamharil[1*], Vina Gabriella Saragih[2]
[1]Undergraduate Management Student, Faculty of Economics and Business, Universitas Terbuka
[2]Faculty of Economics, Universitas Negeri Medan
*Corresponding author e-mail: 043384926@ecampus.ut.ac.id

Abstract: The COVID-19 pandemic has triggered the acceleration of digital transformation in the logistics and expedition services sector in Indonesia. The author's goal in this study is to qualitatively examine how expedition service companies adopt and develop e-logistics during the pandemic, as well as the effect on the efficiency of expedition services and the impact felt by customers. Research data was obtained through interviews with logistics industry players, field observations, and documentation studies from various official reports and scientific journals. This study concludes the development of sustainable and interdependent e-logistics between industry players, the government, and service users, as well as on the improvement of technology and human resource competence.

Keywords: COVID-19, Digital transformation, E-logistics, Logistics

INTRODUCTION

The COVID-19 pandemic has had a tremendous impact on the limitations of mobilization access for all audiences, forcing the adoption of digital technology to minimize in-person interaction. During uncertainty, what is certain is change. So that businesses that want to survive and grow in the pandemic era must be quickly adaptive to run their work to keep running efficiently. This change has two sides for entrepreneur. Entrepreneur who has previously adopted digital before, they have advantages and rapid adaptation. On the other hand, for entrepreneur who are not ready to face the digital era, it is a challenge. Digitizing business processes, using collaborative software, and implementing *e-logistics* in *e-commerce* is one of the critical steps to meet the crisis during the pandemic. Shopping trends have undergone significant changes in the pandemic era. *E-commerce* is no longer just an alternative, but a necessity. From this need arises efforts to maximize the best service from business actors for customers so that the business can continue to run effectively.

In addition to the adaptation made by entrepreneurs, adaptation also occurs for consumers. Major changes in consumer behavior and business operations, including in the expedition service sector. Mobility restrictions and a surge in online shopping have made expedition companies have to adapt quickly through digital transformation. This research aims to understand how shipping companies in Indonesia are adopting digital technology during the pandemic, as well as the challenges and impacts felt. Digitalization in the logistics industry is increasingly strategically important for businesses because it has an impact on industry paradigms, business models, and limitations (Barrett et al., 2015; Cichosz, 2018). Currently, more companies are allocating resources to exploit digital opportunities that have the potential to transform society, the economy, and organizations (Cichosz, 2018; Hribernik et al., 2020; Mikl et al, 2020b). Companies are driving digitalization as a force of change, not only between institutions, organizations and companies but

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

also as an opportunity to create entirely new products and services (Loebbecke & Picot, 2015; Herold et al., 2021).

According to Kayikci (2018), logistics digitalization allows for round-the-clock transparency from suppliers to customers or in other words there must be transparency along the supply chain. In addition, logistics must gain a greater vision to meet the requirements of industry 4.0 in a sustainable manner in terms of using the right technologies and increasing vertical and horizontal integration among supply chain partners (Raza et al., 2020). This is also a challenge for companies to digitize logistics services or what is later known as e-logistics (Kadłubek & Grabara, 2015). E-logistics is expected to accelerate the information process of material or product movements, information flow, cash flow, and information flow of logistics documents (Raza et al., 2020). Humans and technology are two things that cannot be separated. Especially during the pandemic, technology has become more often used in daily activities. This is because the pandemic has created a barrier wall for humans to interact with other humans in everything. The most popular activity that people do during the pandemic is shopping virtually. They will use e-commerce applications to buy their products such as Shoppe, Lazada, and Alibaba.

With the phenomenon of online shopping, freight forwarding services are increasingly developing to meet the demand of consumers who shop online by providing ordering services without being limited by country borders. The logistics and expedition sectors are the sectors that have been most impacted during the pandemic. Social restrictions and changes in people's consumption patterns have driven a significant increase in digital transactions and demand for goods delivery. This condition forces business actors to adopt *e-logistics*, which is the application of information technology in the logistics system to increase service efficiency and speed. This study aims to understand how expedition service companies in Indonesia are adapting to the challenges of the pandemic through the adoption of digital technology, as well as its impact on operational systems and customer satisfaction. The COVID-19 pandemic has brought significant changes in various sectors, including the logistics and expedition industries. Social restrictions and increased online shopping activities have led to a surge in demand for freight forwarding services, forcing shipping companies to adapt quickly.

According to research by Saragih et al. (2020), massive social restrictions (PSBB) caused disruptions in the supply chain, but on the other hand, the e-commerce sector experienced rapid growth during the pandemic. Logistics digitalization is the key to facing these challenges. Purbasari et al. (2023) in their literature review stated that the digitization of logistics through transportation management systems (TMS), electronic data exchange (EDI), and warehouse management systems (WMS) can improve the efficiency and effectiveness of expedition services. In Indonesia, expedition companies such as JNE and SiCepat have experienced a significant increase in shipping volume. Arroffi et al. (2022) found that electronic tracking services (e-tracking) and delivery timeliness had a positive effect on customer satisfaction during the pandemic. In addition, Murti et al. (2020) highlighted the importance of information technology and economic digitalization in supporting the transportation and logistics sector in Indonesia during the COVID-19 pandemic. This digital transformation has had many impacts on operational

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

performance, one of which is in hygienic logistics management. During the pandemic, hygiene is upheld in accordance with the health protocols that apply in every stage of delivery

Through a qualitative approach, this study aims to explore how shipping companies in Indonesia implemented e-logistics during the COVID-19 pandemic, as well as its impact on operations and customer satisfaction. Different from previous research that used a quantitative approach, this study examines the development of e-logistics during the COVID-19 pandemic in Indonesia through a qualitative approach by highlighting the perspectives of field actors. The focus on medium-scale expedition companies also provides insights that have not been studied much before. This research has several elements of novelty that distinguish it from previous studies, as follows This study differentiates itself from extant literature through several critical methodological and contextual approaches. In contrast to the preponderance of prior research, which has predominantly been quantitative in nature, this investigation adopts a descriptive qualitative approach. This methodological choice was employed to provide a more profound understanding of the internal dynamics within expeditionary companies during the process of e-logistics adoption amidst the COVID-19 pandemic. Furthermore, this inquiry shifts the analytical focus away from the customer perspectives or system data commonly utilized in preceding studies, instead privileging the experiences and perceptions of internal stakeholders such as operational managers, couriers, and technical staff. This approach thereby provides direct insight into the digital transformation process at the operational level. The scope of the research is specifically delimited to medium- and small-scale expedition enterprises, a segment frequently overlooked in prior scholarship despite facing unique challenges related to human resources, technology, and infrastructure. Significantly, this analysis transcends immediate pandemic responses to examine post-pandemic sustainability, evaluating the viability and long-term operational integration of the implemented digital systems once the crisis has abated.

The primary objective underpinning this investigation is to identify and categorize the specific forms of digital transformation undertaken by expedition service companies in response to the exigencies of the COVID-19 pandemic. Furthermore, this study aims to critically analyse the multidimensional challenges encountered by these enterprises during the complex digitalization process. Concurrently, the research endeavours to evaluate the impact of such digital transformation upon operational efficiency and customer service quality during the crisis period.

The anticipated contributions of this research encompass both theoretical and practical domains. Theoretically, the findings aim to enrich scholarly discourse surrounding digital transformation within the logistics sector, particularly within crisis contexts, and serve as a foundational reference for subsequent research concerning the digitalization of expedition services. Practically, this study endeavours to provide strategic insights regarding best practices in executing digital transformation for expedition service enterprises. Furthermore, it is expected that this research will offer valuable input for policymakers and logistics industry stakeholders in designing digitalization policies responsive to emergency situations, while simultaneously enhancing public understanding regarding changes in expedition services and their implications for consumer experiences.

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

METHOD

This research adopts a descriptive qualitative methodological approach to investigate the subject matter. To establish a robust empirical foundation, data collection was executed through the triangulation of multiple gathering techniques. Primary qualitative insights were derived from in-depth interviews conducted with key resource persons representing prominent expeditionary firms, specifically including stakeholders from JNE, SiCepat, and J&T Express. Complementing these stakeholder perspectives, direct field observations were undertaken to examine real-time operational activities within warehouse facilities and throughout the delivery logistics chain. Furthermore, the study integrated documentary analysis of secondary data sources, comprising internal corporate reports, aggregated expedition delivery datasets, and relevant industry publication.

The main instrument of data collection is a semi-structured interview designed to explore in depth the experiences, perceptions, and challenges experienced by internal actors in the expedition service industry related to the implementation of e-logistics systems during the COVID-19 pandemic. The interview instrument was prepared based on a literature review and research objectives that focused on aspects of digital technology development, operational impacts, implementation constraints, and the sustainability of post-pandemic e-logistics use. Semi-structured interviews were chosen because they provide flexibility for researchers to explore respondents' answers in more depth, while maintaining a focus on the main themes to be researched. The interview questions covered five main areas, namely: (1) the development and implementation of e-logistics technology in the company, (2) the impact and benefits of e-logistics systems on operations and customer service, (3) the challenges and obstacles faced during the adoption process, (4) views related to the sustainability of the use of technology after the pandemic, and (5) the suggestions and expectations of industry players regarding the development of e-logistics.

Interviews were conducted with several key informants consisting of operational managers, couriers, and technical staff at small and medium-scale expedition companies. The interview process is carried out face-to-face and online with a duration of between 30 to 60 minutes to ensure that the data collected is rich and valid. All interviews were recorded with respondents' consent and then transcribed verbatim as the basis for thematic qualitative analysis. The use of this semi-structured interview instrument is expected to provide a comprehensive picture of the digital transformation in expedition services during the pandemic, as well as reveal aspects that have not been touched by previous quantitative research.

RESULTS AND DISCUSSION

The COVID-19 pandemic has become a momentum to accelerate the digitalization of the logistics sector in Indonesia. Shipping companies are faced with the challenge of a surge in shipments due to the increase in e-commerce transactions, which according to Bank Indonesia data reached more than Rp533 trillion in 2023. This situation encourages companies such as JNE,

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

J&T Express, and SiCepat to develop digital systems, strengthen technology infrastructure, and adjust their operational models quickly. The author conducted research for approximately one month with several sources related to this research. This study uses purposive sampling techniques to select informants. This technique allows researchers to select informants who are consciously considered relevant, knowledgeable, and have direct experience related to e-logistics developments during the pandemic.

The criteria for selecting informants are from national expedition companies that are active during the COVID-19 pandemic, have at least 2 years of experience in the field of operations, logistics IT, or expedition management, are directly involved in the logistics or e-logistics digitization process, are willing to be interviewed and provide in-depth data. A total of 8 informants from 5 expedition companies were selected, including: J&T Express, JNE, SiCepat, AnterAja, and Pos Indonesia. They consist of operations, IT staff, HRD, and warehouse managers who provide a holistic perspective on the transformation of the digital logistics system during the pandemic The results of the interview with J&T Express Operations Manager show that the company immediately implemented a real-time tracking system and cloud-based warehouse management to maintain transparency and service efficiency. This move was confirmed by his statement that the customer tracking dashboard system was developed to suppress complaints that increased during the height of the pandemic. The same thing was also conveyed by the head of JNE's technology division, who said that the company began to use machine learning to predict a surge in shipment volume based on daily transaction patterns. This technology serves as a decision-making tool in fleet allocation and distribution management.

The criteria for selecting informants are from national expedition companies that are active during the COVID-19 pandemic, have at least 2 years of experience in the field of operations, logistics IT, or expedition management, are directly involved in the logistics or e-logistics digitization process, are willing to be interviewed and provide in-depth data. A total of 8 informants from 5 expedition companies were selected, including: J&T Express, JNE, SiCepat, AnterAja, and Pos Indonesia. They consist of operations, IT staff, HRD, and warehouse managers who provide a holistic perspective on the transformation of the digital logistics system during the pandemic The results of the interview with J&T Express Operations Manager show that the company immediately implemented a real-time tracking system and cloud-based warehouse management to maintain transparency and service efficiency. This move was confirmed by his statement that the customer tracking dashboard system was developed to suppress complaints that increased during the height of the pandemic. The same thing was also conveyed by the head of JNE's technology division, who said that the company began to use machine learning to predict a surge in shipment volume based on daily transaction patterns. This technology serves as a decision-making tool in fleet allocation and distribution management.

In terms of operations, the head of SiCepat warehouse in Bekasi stated that the volume of shipments increased almost three times during the peak of the pandemic, from 5,000 to 15,000 packages per day. To address this, the company extended working hours, recruited additional couriers, and opened alternative distribution lines. However, this condition also causes congestion

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

at transit points and delivery delays, as revealed by a freelance courier partner who often experiences queues of up to two hours when dropping off goods. These problems show the limitations of infrastructure and system coordination when demand spikes unexpectedly. From the customer's perspective, there is an increase in expectations for the speed and security of expedition services. Consumers are starting to demand accurate tracking features, contactless delivery, and fast customer service responses. An active user of the expedition service stated that he prefers a shipping service that provides contactless services and has a clear tracking app. These expectations strengthen the position of a technologically responsive expedition company.

Meanwhile, from the company's internal side, challenges also come from the readiness of human resources. The Head of HRD JNE in the Greater Jakarta region revealed that not all employees are ready with the new digital system, especially in the operational part of the warehouse. Therefore, the company held intensive training for two months so that the transition to a digital work system could run optimally. The limitation of digital literacy is one of the obstacles in e-logistics optimization, even though companies have adopted advanced technology. Almost all informants stated that the pandemic was the main trigger for the acceleration of digitalization, especially in goods tracking systems, fleet management, and warehouse automation. One of the informants from J&T mentioned "We already have a tracking system, but the pandemic forced all digital features to be directly integrated into customer and courier partner applications, without any lag. The initiatives that emerged during the pandemic are web and mobile based real-time tracking apps, internal dashboard for warehouse and courier workload monitoring, automatic notification system to customers (via WhatsApp and SMS gateway), Web- and mobile-based real-time tracking apps, internal dashboard for warehouse and courier workload monitoring, and automatic notification system to customers via whatsapp and gateway messager

Informants from SiCepat and AnterAja explained that strategic partnerships with e-commerce are the key to operational efficiency. The API (Application Programming Interface) feature speeds up the synchronization of order data, making the delivery process faster, more accurate, and trackable by both parties. *"We integrate our system with marketplaces. Now, receipt inputs, estimated time, and customer complaints can all appear directly on the partner dashboard."* – Informant, SiCepat Technology Division. In general, the results of these findings show that the adoption of e-logistics not only has an impact on operational efficiency, but also affects changes in work structures, consumption patterns, and the logistics services ecosystem at large. Initiatives such as the National Logistic Ecosystem (NLE) and customs digitalization have also encouraged the realization of a more integrated and efficient supply chain. However, to realize a sustainable e-logistics system, support from all stakeholders is needed, ranging from companies, governments, to the community using expedition services.

a. Forms of Digital Transformation Carried Out

The results of interviews with informants from several expedition companies show that the COVID-19 pandemic has become a momentum for accelerating digital transformation. Companies such as JNE, SiCepat and Ninja Xpress are adopting various technologies to respond to the surge

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

in demand and limitations of physical interaction (Westerman, G., Bonnet, D., & McAfee, A. 2011). Some forms of digital transformation were found. The digital transformation landscape within the sector is characterized by several key technological implementations aimed at enhancing visibility and operational efficiency. This includes the adoption of real-time tracking systems integrated through mobile applications, providing automated notifications to customers. Concurrently, operational workflows have been modernized through the digitization of the delivery and package pick-up process, supported by the development of comprehensive delivery management systems. To optimize customer interactions, AI-based chatbots have been deployed to respond quickly and efficiently to inquiries. Furthermore, significant investments have been made in warehouse infrastructure automation, specifically through the utilization of barcode and robotics technology for package sorting within large logistics hubs. This transformation not only improves efficiency but also reduces reliance on risky manual interactions during the pandemic.

b. Challenges in the Digital Transformation Process

Notwithstanding the significant benefits derived from digital transformation, shipping companies encounter substantial hurdles in its implementation. A primary impediment is workforce readiness, as many employees, particularly field personnel, lack familiarity with digital systems, thereby necessitating continuous training initiatives and a distinct shift in organizational culture. Furthermore, geographical disparities in digital infrastructure pose significant challenges; insufficient internet connectivity and technological support in remote areas or regions outside major hubs, such as Java, hinder the ubiquitous deployment of new technologies. Financial constraints also present a formidable barrier, especially for small and medium-sized enterprises (SMEs), given the high initial capital investment required for advanced solutions like warehouse automation and artificial intelligence. Finally, the transition to digital platforms concomitantly increases vulnerabilities regarding data and system security, heightening the risk of cyberattacks as burgeoning volumes of customer data and transactions migrate to cloud-based or application-based environments.

c. The Impact of Digital Transformation on Performance and Services

In general, digital transformation has a positive impact on operations and customer service. First, is to increased efficiency. The delivery process becomes faster and more organized with an automated tracking system. Secondly is to increased customer satisfaction. Customers feel safer and more comfortable because they can monitor the status of their packages in real-time and get more responsive customer service. Lastly, for adaptation to the pandemic. Digital transformation helps companies continue to serve customers with contactless delivery protocols. However, this impact is not evenly distributed. Large companies tend to be more prepared and adaptive, while small companies or disadvantaged areas face limited resources.

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

d. Theory-Based Analysis

These findings support the theory of Digital Transformation according to Westerman et al. (2011), which states that digitalization is not only about technology adoption, but also changes in the way we work, organizational culture, and added value to customers. In addition, the concept of Organizational Readiness for Change is also relevant, because the company's internal readiness is a key factor in the success of transformation. The findings in this study are in line with the results of a study conducted by Vial (2019), which states that digital transformation includes fundamental changes in the way organizations operate and deliver value to customers. In the context of expedition services, digital transformation is not only limited to the use of technology, but also touches on aspects of work culture, process flows, and relationships between companies and consumers.

The PwC Indonesia study (2021) also supports the findings that the COVID-19 pandemic has encouraged the acceleration of digitalization in the logistics and expedition sectors. In the report, it was stated that 67% of logistics industry players in Indonesia acknowledged the increase in investment in the digital technology sector as a direct response to the pandemic. In addition, Westerman et al. (2011) said that organizations that succeed in digital transformation are those that not only focus on technology, but also on developing human resources capabilities and digital leadership. These findings are strengthened in this study, where human resource readiness is one of the main challenges faced by expedition companies, especially in the use of new systems and adaptation to digital workflows.

On the other hand, a study by McKinsey & Company (2020) shows that companies with high rates of digital adoption tend to show better business resilience during the pandemic. This is also seen in the large companies in the study (such as Ninja Xpress and SiCepat), which recover faster from operational disruption due to their well-established digital infrastructure. During the COVID-19 pandemic, there was a sharp spike in the use of *e-commerce services* in Indonesia. According to a report by Google, Temasek, and Bain & Company (2021), the value of Indonesia's digital economy grew from USD 47 billion in 2020 to USD 70 billion in 2021, largely contributed by the *e-commerce* sector. This growth has a direct impact on the volume of shipments by expedition service companies.

Data from the Indonesian Logistics Association (ALI) shows that shipping volumes increased by 40% in 2020, forcing expedition companies to adapt immediately. One of the most obvious forms of adaptation is the development of mobile apps and real-time package tracking systems by almost all major companies such as J&T, SiCepat and Ninja Xpress.

Some other important facts relevant to digital transformation in expeditions:

1. SiCepat launched a sorting center automation system that can process up to 500 thousand packages per day, utilizing AI and robotics technology (SiCepat 2021).
2. Ninja Xpress developed a data-driven digital platform to help MSMEs monitor shipments,

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

leveraging API integration and interactive dashboards (Kompas.com, 2021).
3. JNE increased server capacity and tracking systems during the pandemic to deal with an increase in data traffic of up to 60% of normal conditions (JNE Annual Report, 2021).

These facts reinforce the research findings that expedition companies are not only implementing technology as an emergency response but revolutionizing systems and processes across the board. The data and reports above show that digital transformation is no longer an option, but a necessity in maintaining the sustainability of the expedition business during the pandemic. The fact that companies are developing automation systems, AI-based tracking, and integration platforms shows an increasingly high level of digital maturity. However, not all companies can access this technology equally. Medium and small companies (local logistics) still face financial and technical barriers, as also revealed by one of the informants of this study, who mentioned that "our internet access and human resources are still limited, especially outside of big cities."

One of the important findings of this study is the emergence of inequality in e-logistics adoption capabilities between large expedition companies and MSME actors engaged in the local logistics sector or small delivery service providers. Informants from large companies such as JNE, J&T, and SiCepat mentioned that before the pandemic, they already had digital infrastructure (servers, cloud, mobile applications), internal IT teams and budgets for system development, direct partnerships with large e-commerce platforms. For example, AnterAja reports that their system allows real-time tracking down to the courier level, while JNE has implemented an AI-based warehouse dashboard for daily shipment load management.

Logistics MSME actors who were interviewed additionally (through observations on local delivery partners and regional relations) experienced several obstacles, namely not having their own digital applications, still using manual methods (WhatsApp, paper recording, Excel), relying on marketplaces or aggregators (such as GrabExpress or GoSend) for service exposure. Some actors are not even able to update the tracking service due to limited funds and the absence of a development team. On the other hand, logistics MSME actors who were interviewed additionally (through observations on local delivery partners and regional relations) experienced several obstacles, namely not having their own digital applications, still using manual methods (WhatsApp, paper recording, Excel), relying on marketplaces or aggregators (such as GrabExpress or GoSend) for service exposure. Some actors are not even able to update the tracking service due to limited funds and the absence of a development team. This leads to delays in information to customers, lowering consumer confidence. *"We participate in online delivery services, but the system is not ours. If there is a problem, we can only wait for a center or a third-party application".* Local expedition service owner, Bandung. Large shipping companies generally have a technology infrastructure, competent human resources, and a thoroughly integrated system. On the other hand, Micro, Small, and Medium Enterprises (MSMEs) tend to rely on third-party services and experience limitations in terms of innovation and digital efficiency.

To provide a clearer picture, Table 1 is showing a comparison of digital features used by MSMEs and large companies in the context of e-logistics:

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

Table 1. Digital Features used by MSMEs and Larger Companies of E-Logistics

Digital Aspects/Features	MSMEs	Large Companies
Online Booking Platform	Generally using third-party platforms (Shopee, Tokopedia)	Have your own platform/application with an integrated system
Tracking	Simple tracking based on receipt numbers	Real-time tracking with GPS and automatic notifications
Warehouse System Integration (WMS)	Manual/semi-digital (Excel, Google Sheets)	Using Warehouse Management System (WMS)
Digital Payment System	Limited to bank transfers and e-wallets	Integrated with payment gateway and internal accounting system
Use of Big Data/AI	Minimal or no	Used for demand prediction, delivery routes, etc.
Digital Customer Service	WhatsApp, social media	Automated chatbots, digital call centers, data-driven CRM
Automatic Packaging & Labeling	Manual	Automated through machine and barcode system
Access to Technology Infrastructure	Limited, depending on logistics partner	Have a data center/cloud, self-contained IT infrastructure
Technological Innovation Capacity	Limited due to cost and human resources	High due to internal research and development support
System Scalability	Not always ready for a surge in orders	Ready for major expansion and high demand

The inequality in e-logistics adoption creates a significant gap between large and small actors. If it is not intervened through training, technology subsidies, or inclusive logistics platforms, MSMEs will be further left behind. This research emphasizes that e-logistics not only has an impact on the internal efficiency of companies, but also on the structure of the national logistics market.

CONCLUSIONS AND RECOMMENDATIONS

This research aims to elucidate how expedition service enterprises in Indonesia navigated digital transformation amidst the COVID-19 pandemic, concurrently identifying associated challenges and their impacts on services and operations. Based on a qualitative study utilizing in-depth interviews and documentary analysis, findings indicate that digital transformation within the shipping sector accelerated rapidly during the pandemic. This acceleration was impelled by the urgent exigency for contactless services, surging online shopping volumes, and shifts in consumer behavior. In response, expedition firms proactively developed mobile applications, real-time tracking systems, warehouse automation, and technology-based customer services. However, this transformation process encountered primary impediments, including limitations in digital infrastructure within specific regions, human resource (HR) readiness, internal resistance to change, and substantial investment requirements—challenges that were more acute for small and medium-sized enterprises compared to larger corporations.

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

Notwithstanding these hurdles, digital transformation demonstrated positive impacts on operational efficiency and customer service quality. Firms capable of swift adaptation experienced enhanced service speed, customer satisfaction, and business resilience amidst the crisis. Overall, the pandemic functioned as a catalyst, accelerating digitalization within the expedition service sector. Nevertheless, the success of such transformation is highly contingent upon organizational readiness, leadership, and adequate digital infrastructure support, thereby necessitating synergistic collaboration among the government, industry stakeholders, and technology providers to fortify the digital foundation of Indonesia's logistics sector.

Looking ahead, enterprises need to develop long-term strategies to strengthen e-logistics, oriented towards enhancing technological capabilities and developing digital human capital. Furthermore, interline data integration and user-friendly customer interface platforms should be designated as top priorities to maintain customer loyalty. Concurrently, the government is expected to expand the scope of support for the digitalization of the logistics sector, particularly for Micro, Small, and Medium Enterprises (MSMEs) and smaller expedition actors. The acceleration of digital infrastructure development in disadvantaged regions and the strengthening of national logistics platforms must be continued to ensure that the benefits of digital transformation are realized equitably across the sector.

BIBLIOGRAPHY

Adamczewski, P. (2017). E-logistics as the ICT support in modern Polish organizations. *Chinese Business Review, 16*(8).

Berawi, M. A., Miraj, P., & Sari, M. (2020). The role of digital technologies in shaping sustainable and smarter cities. *CSID Journal of Infrastructure Development, 3*(1).

Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2002). *Supply chain logistics management* (International ed.). McGraw-Hill.

Brennen, S., & Kreiss, D. (2016). Digitalization and digitization. *Culture Digitally*.

Büyüközkan, G., Feyzioğlu, O., & Nebol, E. (2008). Selection of the strategic alliance partner in logistics value chain. *International Journal of Production Economics, 113*(1), 148–158.

Castells, M. (2010). The power of identity. *The information age: Economy, society, and culture* (Vol. 2). Wiley-Blackwell.

Chou, Y. C., Chuang, H. H. C., & Liang, T. P. (2022). Elaboration likelihood model, endogenous quality indicators, and online review helpfulness. *Decision Support Systems, 153*, 113683.

Cichosz, M. (2018). Digitalization and competitiveness in the logistics service industry. *E-Mentor, 77*(5), 73–82.

Dumanska, I., & Matviiets, O. (2021). E-logistics: Definitions, development, and conceptual framework. *Foreign Trade: Economics, Finance, Law, 115*(2), 44–55.

Erceg, A., & Sekuloska, J. D. (2019). E-logistics and e-SCM: How to increase

Page: 122-133
E-ISSN: 2721-298X
DOI: https://doi.org/10.33830/tjeb.v6i2

competitiveness.*Logforum, 15*(1), 83–93.

Frontoni, E., Rosetti, R., Paolanti, M., & Alves, A. C. (2020). HATS project for lean and smart global logistic: A shipping company case study. *Manufacturing Letters, 23*, 12–15.

Herold, D. M., Ćwiklicki, M., Pilch, K., & Mikl, J. (2021). The emergence and adoption of digitalization in the logistics and supply chain industry: An institutional perspective. *Journal of Enterprise Information Management, 34*(6), 1917–1938.

JNE. (2021). Company Annual Report 2021.

Korchagina, E., Kalinina, O., Burova, A., & Ostrovskaya, N. (2020). Main logistics digitalization features for business. *E3S Web of Conferences, 164*, 10023.

Lan, H., Ya, L. I., & Shuhua, W. (2016). Improvement of online food delivery service based on consumers' negative comments. *Canadian Social Science, 12*(5), 84–88.

Lei, H., Cui, Y., & Chiu, M. M. (2018). The relationship between teacher support and students' academic emotions: A meta-analysis. *Frontiers in Psychology, 8*, 2288.

Luhur Prianto, A., Wongsurawat, K., & Yama, A. (2020). Critically assessing the factors contributing toward e-logistics customer satisfaction by considering mediating role of information technology: A case study of Thailand food sector. *World Food Policy, 6*(1), 1– 24.

McKinsey & Company Indonesia. (2020). *How COVID-19 is reshaping Indonesia's digital economy*.

Mikl, J., Herold, D. M., Pilch, K., Ćwiklicki, M., & Kummer, S. (2021). Understanding disruptive technology transitions in the global logistics industry: The role of ecosystems. *Review of International Business and Strategy, 31*(1), 25–44

PwC Indonesia. (2021). *COVID-19: Accelerating digital transformation in logistics and supply chain*.

SiCepat Express. (2021). *Press release: Digitizing operational processes*.

Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems, 28*(2), 118–144.

Westerman, G., Bonnet, D., & McAfee, A. (2011). *Digital transformation: A roadmap for billion-dollar organizations*. MIT Center for Digital Business.

Wiranto, R., & Sanjaya, R. (2022). E-logistic optimization for MSME's to prepare the new normal era (conceptual framework). *Journal of Business and Technology, 2*(1), 42–49.

Woschank, M., Kaiblinger, A., & Miklautsch, P. (2021). Digitalization in industrial logistics: Contemporary evidence and future directions. *In Proceedings of the International Conference on Industrial Engineering and Operations Management* (pp. 1322–1333).