Research on the Impact of Digital Transformation on Corporate ESG - A Case Study of Jingdong Logistics

Zhengyang Liu *

The High School Attached to Northeast Normal University, Changchun, China

* Corresponding Author Email: oscar_liu@Hsannu.com

Abstract. The purpose of this research is to analyze the impact that digital transformation has on the environmental, social, and governance (ESG) elements of businesses by using Jingdong Logistics as a case study. Jingdong Logistics' environmental, social, and governance (ESG) indicators have been impacted both directly and indirectly by the digital transformation that the company has undergone, as indicated by the study of data changes and measures taken both before and after the transition. This digital transition has led to huge reductions in greenhouse gas emissions, which is good news for the environment; but, it also creates challenges in terms of energy consumption requirements. Although there has been an increase in the number of training hours and a drop in the number of workplace injuries, there has been an increase in the number of full-time employees, while there has been an increase in employee turnover. Even though there was an increase in the number of vendors, anti-corruption incidents decreased. Regarding the governance side of things, improvements were made to data security and transparency. According to the findings of the inquiry, digital transformation had a positive impact on the environmental, social, and governance (ESG) of Jingdong Logistics; nevertheless, it also brought up new challenges that call for continued attention and growth.

Keywords: Digital transformation; ESG; JD Logistics.

1. Introduction

1.1. Research Background

Companies need to go digital to stay competitive in the world economy of today. This changes how a business talks to people outside of it. We need to find a mix between being socially responsible and being economically efficient if we want to have long-term growth. Digitization has made things more efficient and created new business possibilities. However, problems like keeping data safe and teaching employees how to use new technologies will arise at the same time. This effort is becoming more important as the need for long-term growth grows around the world. JD Logistics is a top company that offers excellent services, has advantages in technology and management, and helps with long-term growth. Protection of the environment, workers, and communities in the area are also affected. We can see how ESG and changes in technology are connected by looking closely at these effects. Other businesses can use what they find to help the growth of the industry in the long run. We need to do a thorough study of how digital innovations change businesses' ICT priorities so that we can come up with theories that support long-term growth and give useful advice.

1.2. Literature Review

1.2.1. A study of the environmental impacts of digital transformation

Liu et al. discovered that going digital has a big effect on how environmentally friendly manufacturing companies are, which can successfully lower the amount of pollution they put into the air [1]. They put this conclusion to the test in several different ways to make sure it was true. Xu came to the conclusion that going digital in an enterprise can greatly improve both the performance of green technology innovation and green management innovation [2]. Going digital in an enterprise can improve two aspects of green innovation performance by making it easier to get money and making internal control better. However, there isn't a big difference between the two when it comes to promoting green technology innovation performance. Wang et al. concluded that getting heavily

polluting businesses to go digital faster can boost the level of green technological innovation and information sharing, which in turn improves ESG performance [3]. This gives Chinese businesses some ideas on how to reach sustainable growth in the digital economy and the national implementation of the "dual-carbon" goal. Yang et al. concluded that manufacturing companies' pollution levels drop greatly when they go digital [4]. Every additional unit of digitalization can cut the amount of pollution that industrial companies put into the air by 27.7%. The environmental effects of digitizing manufacturing are very different depending on the business and the region. Digitizing manufacturing hurts company pollution emissions. This is achieved through front-end control, which increases productivity and changes the way energy is used, and back-end management, which improves the ability to treat pollution.

1.2.2. Study of the impact of digital transformation on society

They point out that enterprises create value by meeting social and customer needs and fulfilling their social responsibilities. The study of Ni et al. shows that digital transformation contributes to the growth of enterprises and has a great publicity effect, especially for leading enterprises [5]. The study of Chen and Zhao found through empirical tests that digital transformation can inspire enterprises to take more social responsibility [6]. Hongjun Xiao et al. emphasized that the digital transformation of enterprises can greatly enhance their social responsibility capabilities, thereby improving their social responsibility performance [7]. Xin et al. argued that digital transformation helps to improve the willingness and ability of enterprises to fulfill social responsibility, and increases their social responsibility performance through improving management mechanisms, optimizing production methods, strengthening external relationships, etc [8].

1.2.3. A study of the impact of digital transformation on corporate governance

Wei et al. discovered that going digital makes corporate governance much better [9]. They also did robustness tests using instrumental factors, the Heckman two-stage method, sample grouping regression, and other methods, but their results were mostly the same. It has been found that implementing digital transformation greatly lowers the degree of information asymmetry. It has also been found that lowering the difference in the amount of information available makes it easier for businesses to improve their corporate governance. This shows that unequal access to information is linked to both digital transformation and the level of corporate governance. Li et al. thought that businesses could improve their financial performance by going digital, using financial big data for better analysis, and combining and analyzing data to make businesses more profitable [10]. The author Ping thought that digital change is a big part of making businesses more productive overall [11]. When it comes to the structure of vertical relationships, the effects of digital transformation are different depending on things like firm size, ownership type, and amount of innovation. Because of these changes, the company's supply chain works better as a whole, which makes the company more productive. Jin et al. said that the level of digital transformation was higher when there was better company governance [12].

1.3. Objective

Literature review and case study methods are used in this study to look into how digital change has affected the company's ESG (environmental, social, and governance). Based on the theory, social responsibility reports, operational data, and other relevant information about the case companies were gathered in order to look into how the effects worked and finally come to a conclusion.

2. Jingdong Logistics Digital Transformation Case Introduction

2.1. Introduction to Jingdong Logistics

Jingdong Logistics is the logistics arm of Jingdong Group. It was formed in 2007 and is now one of China's top integrated logistics service providers. Its business includes things like transport, storage,

delivery, supply chain management, and more. It delivers all over the country and offers different delivery choices, like same-day delivery, next-day delivery, and so on. It has advanced storage facilities and an intelligent management system, so it can offer custom storage options. It wants to improve supply chain management services, such as planning, buying, distributing, managing stockpiles, and more. The idea behind the service is to keep coming up with new ways to help customers succeed in business, improve the level of service, and push the limits of logistics services.

2.2. Motivation for the Digital Transformation of Jingdong Logistics

Jingdong Logistics uses a smart, collaborative logistics network and technology to give customers integrated supply chain logistics services. At its core, the company uses warehouse management data, and algorithms to drive operational automation, management digitalization, and decision intelligence to fix issues like low inventory turnover, high operating costs, and slow inventory turnover. The digitization of information and the creation of a platform for information and data have made it possible for transportation information to be shared in real-time, which has improved the customer experience. Plan for business before the change, Jingdong Logistics used the useless "people looking for things" picking method, which made picking less efficient and costlier.

2.3. Jingdong Logistics' Digital Transformation Changes

2.3.1. Information Digital Transformation

Jingdong Logistics has made its operations more efficient by making decisions based on data and using smart warehouse systems to improve order handling, supply chain management, and delivery routes. To cut down on costs and delivery times, algorithms improve the design of transportation networks and the planning of delivery routes. Digital technology improves the user experience by letting them watch logistics in real time, choose their delivery times, and talk to smart customer service systems. It keeps improving its service model by adding cross-border logistics, delivery within the same city, cold chain logistics, and other services to reach new customers. It is constantly working to improve technology and works with tech companies and universities to encourage the growth and use of logistics technology and make the company more competitive.

2.3.2. Digital transformation of business models

Jingdong Logistics fixed the issue of slow picking by putting in place a sophisticated order management system that enables automated order processing and real-time tracking. This made the processing faster and more accurate. Adding automated tools and smart warehouse management systems has made warehouse work faster and more accurate. Through algorithms, the design and planning of the delivery network have been optimized. This has cut costs, shortened the time it takes to deliver goods, and made the process more efficient and satisfying. Digital technologies like real-time logistics tracking, flexible delivery time choices, and smart customer service systems can make the user experience better. Added more cross-border logistics services and used big data technology to make inventory management, demand forecasts, and transportation planning more accurate and efficient. Added smart logistics equipment to automate and smarten up processes to make them safer and more efficient.

2.3.3. Supply chain digital transformation

Because people are buying more things and technology is getting better, the supply chain will change from push to pull and the business trend will change from B2C to C2B. Smart production, networked collaboration, personalized customization, and service growth will be possible with new models and business forms. A new trend in the logistics business is to build an intelligent and mutually beneficial industrial supply chain platform. This is part of the trend of connecting industries. There is a full supply chain service and a supply chain technology platform on the supply chain business platform. The full supply chain service opens up the supply chain from the source to the customer and offers bundled supply chain services. To boost supply chain business and data center building and make things run more smoothly, the supply chain technology platform uses technologies like

robotics, AI, 5G, and big data. As technologies like AI, big data, cloud computing, and robots improve, they will have a big impact on all parts of logistics. These changes will lower costs, make things more efficient, and help guide upstream manufacturing to give customers a better service experience.

2.4. The Effectiveness of Digital Transformation of Jingdong Logistics

Jingdong Logistics continued to grow quickly in 2022. The company made a total of RMB137.4 billion, which is 31.2% more than the previous year. The Shake Shack e-commerce website had more than 20,000 merchants as of December 31, 2022. Outside customers brought in RMB89.1 billion, which is 50.8% more than the previous year and makes up 65% of all income. The combined supply chain was able to cut costs and work more efficiently after BOAC normalized its operations. The company kept making more money, and its non-IFRS net profit reached almost RMB870 million. Integrated supply chain customers brought in a total of 77.4 billion yuan, with 79,928 foreign customers bringing in an average of 360,000 yuan. Other users brought in RMB60 billion, which is 78.3% more than the same time last year. A lot of smart express trucks were used, and the number of delivery units rose by more than 260% from one year to the next. Second, delivery times were cut down from an average of three days before the change to just two days, which made service faster and more efficient. The average shipping cost per order went down from 20 yuan before the transformation to 15 yuan after the transformation. This was made possible by improving the design of the logistics network and planning of the distribution routes. Also, users are much happier with the quality of the service now than they were before the transformation; the rate went from 4.0 to 4.5.

3. Analysis of the Impact of Jingdong Logistics Digital Transformation on ESG

3.1. Environment

For example, Table 1 shows that since the company went digital, its ESG data has changed a lot in several areas. First, direct greenhouse gas emissions went down from 236,729 tons in 2021 to 148,600 tons in 2022. On the other hand, indirect greenhouse gas emissions from energy went up from 205,743 tons to 792,000 tons. Second, the amount of water used went down from 4,198,769 tons in 2021 to 3,156,000 tons in 2022, but the total amount of packaging used for manufactured goods went up from 222,023 tons to 556,000 tons. This shows that the company has made some progress in lowering direct emissions, but it may still have trouble lowering energy use. This could mean that the business has made better use of its resources to some extent, but it also means that it has to deal with more packaging. Finally, the amount of gasoline used went up a lot; in 2022, it was 86,172,000 liters, up from 1,823,838 liters in 2021. This may show that the company is growing in the traffic and transportation field, but it needs to pay more attention to how it affects the environment. Together, Kiel has made some progress since going digital when it comes to the environment, using resources wisely, and using less energy. But it also faces new problems and needs to keep trying to find a balance to reach its sustainability goals.

Table 1. Changes in environmental data before and after the digitalization of Jingdong Logistics.

Indicator name	2021 Target	2022 Target	work unit	change ratio%
Direct greenhouse gas emissions	236,729	148,600	ton	-37%
Indirect greenhouse gas emissions from energy	205,743	792,000	ton	+285%
water consumption	4,198,769	3,156,000	ton	-25%
Total amount of packaging used for manufactured goods	222,023	556,000	ton	+150%
Gasoline consumption	1,823,838	86,172,000	ton	+4625%

3.2. Society and Governance

After going digital, Jingdong Logistics' ESG data shows several changes (Table 2). First, the number of full-time workers rose from 310,448 in 2021 to 390,029 in 2022, showing that the company is hiring more people. The general employee turnover rate went up from 8% to 19%, though, so the

company may need to pay more attention to management and worker retention. The average training time for a male employee went up to 15 hours, and the average training time for a female employee went up to 19 hours. This shows that the company has improved the training it gives to its employees. Also, the number of lost work days due to accidents went down a little, to 51,586 days. This may be because the company is better at managing safety. The number of safety drills also went up a lot, to 3,542. This shows that the company is putting a lot of effort into making people aware of safety issues and getting them ready for emergencies. In particular, the number of workers fired or punished for bad behavior dropped from 180 to 178 after the switch to digital, which shows that anti-corruption management is working. Finally, the number of wholesalers grew a lot, to 15,517, which shows that the company's business and supply chain are growing. Overall, Jingdong Logistics has made some progress in managing employees, training them in safety, and fighting corruption since going digital. However, it now faces new problems that need constant attention and growth.

Table 2. Changes in data on social and governance aspects before and after the digital turnaround of Jingdong Logistics.

Indicator name	2021 Target	2022 Target	work unit	change ratio%
Number of full-time employees	310,448	390,029	man	+26%
Total staff turnover ratio	8	19	percentage	+138%
Average number of hours of training per male employee	11	15	hourly	+36%
Average number of hours of training per female employee	18	19	hourly	+6%
Number of working days lost due to work-related injuries	53,227	51,586	day	-3%
Number of security drills	1,573	3542	time	+125%
Number of incidents in which employees were dismissed or disciplined for corruption	180	178	number	-1%
Number of suppliers	4,903	15,517	number	+216%

4. Conclusion

The move to digital has had a clear and direct effect on Jingdong Logistics' ESG metrics: In terms of the environment, even though greenhouse gas emissions have gone down, energy use has gone up, so people need to pay attention to how they use energy more efficiently. In terms of society, the number of workers has gone up, but so has the turnover rate. To keep workers, training hours need to be increased. In terms of governance, digital transformation has made data safer and more open.

Logistics network optimization, intelligent route planning, and freight bundling are some of the projects that have successfully cut down on pollution and resource use, improved the efficiency and openness of the supply chain, and pushed for social inclusion and long-term economic growth. In answer to the above, the report suggests improving overall ESG performance by better monitoring and managing energy use, making the most of employee training and retention, and always making supply chain management better.

References

[1] LIU Hongduo, CHEN Zhaoyong, CHEN Xiaoshan. A study on the environmental performance of digital transformation - micro evidence from listed companies in China's manufacturing industry [J]. Social Science, 2023(5):126-137.

[2] Xu Mengyue. Research on the impact of digital transformation on green innovation performance of heavily polluting enterprises [J]. Modern Business, 2024(03):53-57.

[3] J. Wang, Z. Hong, Z. Han, Q. Duan et al. The impact of digital transformation of heavy polluting enterprises on their ESG performance and the mechanism of its role [J]. Science and Technology Management Research, 2024, 44(01):192-205.

[4] Yang Laike, Yan Ke. Impact of digital transformation on pollution emission of Chinese manufacturing enterprises - A three-dimensional panel data analysis based on micro level [J]. Resource Science, 2023, 45(08):1481-1496.

[5] NI Kejin, LIU Xiuyan. Digital transformation and enterprise growth: Theoretical logic and Chinese practice [J]. Economic Management, 2021, 43(12): 79-97.

[6] ZHAO Chenyu. Research on the impact of digital transformation on corporate social responsibility [J]. Contemporary Economic Science, 2022, 44(02): 109-116.

[7] XIAO Hongjun, YANG Zhen, LIU Meiyu. The social responsibility promotion effect of corporate digitalization: a test of internal and external dual paths [J]. Economic Management, 2021, 43(11):52-69.

[8] Hao, Tan Weijie, Zhang Wenbo. Does Digital Transformation Enhance Corporate Social Responsibility Fulfillment? [J]. Western Forum, 2022, 32(03):63-80.

[9] WEI Yicheng, LIU Xiaoyu, HE Fan. Research on Digital Transformation and Corporate Governance Level-Empirical Evidence from A-share Main Board Listed Companies [J]. Financial Development Research, 2022(03):18-25.

[10] Li Jing. Research on the impact of digital transformation on corporate financial performance [J]. Frontiers of International Accounting, 2023, 12(2):184-194.

[11] Li P, Zhao X. The impact of digital transformation on corporate supply chain management: Evidence from listed companies [J]. Finance Research Letters, 2024, 60: 104890.

[12] Jin W, Wang QY, Wu LD. Corporate governance level and digital transformation: evidence from listed companies [J]. Economic Issues, 2024(03):30-37.