Proceedings of the 7th International Conference on Economic Management and Green Development
DOI: 10.54254/2754-1169/32/20231591

Information Sharing Facilitates Sustainable Business Operations: Case Analysis of Tesla's Supply Chain

Jiashuo Xu[1,†], and Xueyan Zhao[2,a,*,†]

[1]*College of Physics and Optoelectronic Engineering, Shenzhen University, Shenzhen, China, 518060*
[2]*School of Management Science and Real Estate, Chongqing University, Chongqing, China, 400044*
a. 20216002@stu.cqu.edu.cn
**corresponding author*
[†]*These authors contributed equally.*

Abstract: In the era of rapid economic development, the degree of digitization directly impacts the company's future development. Because of digital transformation, information sharing plays an important role in improving the operational effectiveness of enterprises. In addition to the impact of digitization on the company's future development, the issue of sustainability has also become increasingly important in recent years. Sustainable supply chain practices have been widely recognized as a key factor for the long-term success of companies. This paper details the role of information sharing for the sustainability of all parts of the business, using Tesla's supply chain as an example. At the same time, some feasible suggestions are made for other enterprises in the digital transformation stage concerning production, sales, and after-sales.

Keywords: enterprise, information sharing, supply chain system

1. Introduction

With the rapid development of information technology, the international market faces various challenges on many fronts, including international politics, the economy, and transportation. Enterprises need to develop a sustainable development path where opportunities and risks coexist in the market environment. Studies have shown that digital transformation has a positive effect on enterprise innovation, and more and more enterprises are adopting digital transformation. Digital transformation has also greatly enhanced the market competitiveness of enterprises and contributed significantly to sustainable operations [1]. Meanwhile, information sharing, as one of the main outcomes of digital transformation, is important in developing enterprise operations. However, there is very little literature that systematically provides an integrated analysis of the role of information sharing in a firm's supply chain. Therefore, using the successful digital transformation of Tesla as an example, this paper uses case studies and other research methods to explain the beneficial effects of information sharing systematically and macroscopically on a company's sustainable operation and make relevant recommendations.

A large body of literature identifies digital transformation as a current market trend and a catalyst for business growth. As a beneficial effect of digital transformation for the enterprise supply chain,

DOI: 10.54254/2754-1169/32/20231591

information sharing also plays a significant promoting effect. Many studies have detailed the role of information sharing in a particular operational management aspect within an enterprise, such as reducing the impact of the bullwhip effect [2], establishing good supply chain partnerships, and thus improving the performance of the enterprise [3], establishing IT-based financial shared services to promote standardization and integration of financial operations [4], and synergizing with supply chain management techniques to optimize the resource allocation of products [5]. However, there needs to be more literature that integrates all aspects of the role of information sharing on the front-end, middle-end, and back-end of the business in systematic research analysis. Therefore, this article will take Tesla's successful digital transformation as an example and use a macro perspective to analyze the effects of information sharing on various operational aspects of enterprises and how to promote the sustainable development of enterprises.

Using the successful digital transformation of Tesla as an example, this article will systematically and macroscopically explain the beneficial effects of information sharing on sustainable business operations from the front-end, middle-end, and back-end and make recommendations for the company's future development. Tesla Motors is not just a company that makes cars, it is committed to building a complete energy ecosystem and accelerating the world's transition to sustainable energy. Since its establishment in 2003, Tesla has gradually shifted from a traditional operating model to one closely linked to the Internet [6]. At the same time, Tesla focuses on sharing and exchanging information to drive the company's growth and innovation better. Within Tesla, employees can share and communicate information in various ways, including through internal social networks, email, and video conferencing. In addition, Tesla encourages employees to participate in multiple internal training and seminars to better understand the company's business and technology [7].

Tesla is committed to combining digital information with high-end technology, responding to the actual needs of its customers through rigorous algorithms, and providing them with better service based on the information gathered. At the same time, Tesla has taken measures to protect the security of customer data, including the use of encryption technology and security protocols to protect the transmission and storage of data. Tesla uses the DTC marketing model to establish a direct communication relationship with its customers, allowing the company to operate better. Tesla has chosen not to sell through third-party dealers but to sell its cars directly through its shops, strengthening its brand image and customer loyalty and providing potential customers with a unique in-store experience.

The benefits of information sharing have made Tesla the undisputed leader in new energy vehicles in recent years, with a much higher gross margin per vehicle than other similar vehicles. Tesla is one of the world's most valuable companies and one of the most beneficial car manufacturers as of 2023. Tesla has always maintained a steady trend, and as it expands its global operations, it will continue to systematically refine its complex supply chain to fulfill its mission better. This paper will demonstrate the positive role of information sharing in the three aspects of Tesla's operations and conclude with recommendations.

2. Case Study

2.1. The Role of Information Sharing on the Front-End Production of Enterprise

Information sharing has an optimized effect on the front-end cost control as well as quality control of the company. Tesla Inc. collects and precisely traces data for full-scale monitoring and management of all products in its super factories. This data is then accurately transferred to the production information system and shared with the relevant departments and employees. At the same time, decision-makers can adjust and improve the front-end production of the enterprise the

DOI: 10.54254/2754-1169/32/20231591

first time. The timely decision-making brought about by such information sharing can significantly improve the ability of the production department to deal with market risks. On this basis, production-oriented enterprises can find the generality of the production process in a large amount of data. At the same time, pre-purchase and adjust the raw materials required for production, thereby reducing procurement costs. The data collection of raw material manufacturers and information sharing can facilitate decision-makers to select reliable sellers with high-quality products. The results of multiple comparisons can directly affect the company to obtain high-quality products at low cost. In addition, Tesla has adopted a technology called the "digital twin system", which can compare the data on the actual production line with the virtual model to improve production efficiency and quality further. It can be concluded that information sharing can optimize front-end production, improve the ability to deal with risks when the bullwhip effect is transmitted to manufacturers, and at the same time, facilitate the procurement of raw materials, improve economic benefits, and promote sustainable operations.

2.2. The Importance of Information Sharing for the Mid-Tier Sales Chain of the Enterprise

Information sharing in the Mid-Sales Segment of the business plays an undertaking role in the operations of the business. A digital sales chain facilitates the collection of customer sales information, such as their specific needs, budgets, and expected delivery times. By accurately analyzing and sharing sales information, companies can help understand customer needs and opinions, target adjustments and promotions to product pricing and whom they sell to, provide better customer service promptly, find the right markets, quickly grasp market opportunities, and create opportunities for sales growth. In addition, enterprises can realize advanced production and transportation of goods through information analysis, thus reducing storage costs, transportation time, and expenses and further optimizing the sales chain.

Information sharing and information transparency can help enterprises grasp real-time information changes in the supply chain, improve the efficiency of logistics and inventory control, and avoid problems such as order stagnation. A digital sales platform also facilitates enterprises to summarize and analyze the results of sales information. Sales are the core of the business operation, and changes in sales data can directly reflect the operation of the enterprise. This result-oriented approach can forecast market demand and sales trends with relative accuracy, provide reconciliation information for the production and after-sales ends, avoid problems such as large amounts of idle output and inventory, reduce the impact of the bullwhip effect, and facilitate the normal operation of the supply chain [8]. Therefore, the importance of information sharing to the mid-end sales circle of an enterprise is reflected in the requirements for front-end products and guidance for back-end sales.

2.3. Information Sharing for the Improvement of Enterprise Back-End After-Sales Service

The addition of information sharing can significantly improve the added value of products and increase the profitability of companies, especially after-sales services. Tesla, for example, collects the driving data of every Tesla car sold to provide a better service experience in the after-sales phase. On the one hand, when the customer sends the vehicle to the factory for maintenance, the factory can analyze the cause of the car’s damage quickly through the collected driving data and provide the optimal repair plan to meet the customer’s repair needs greatest extent. On the other hand, by recording and analyzing drivers' driving habits, testing the car's performance, and modifying it according to the individual needs of customers, Tesla can optimize and upgrade the products of different customer groups and improve customers’ awareness of the brand. Recognition and satisfaction, and then enhance the sustainable competitiveness of enterprises.

DOI: 10.54254/2754-1169/32/20231591

Tesla has also adopted a unique and efficient internal and external management model. Internally, problems reported by customers enter the information sharing system, which provides direction and guidance for the production side to improve the development of the next generation of products, thus better completing the product renewal. The new, more targeted products produced can stand out and attract more potential customers [9]. Externally, through the customer-oriented services provided by information sharing, customers build lasting trust in the brand, and voluntarily promote the company, accumulating a good reputation in the industry for the company. As a result, the company has obtained some loyal customers and thus has a strong reputation in the entire new energy vehicle industry.

Enterprises can parallel optimize their internal and external operation structures by sharing information. It can not only promote two-way improvement and rapid development of after-sales service but also enhance the service value of enterprise products more efficiently and help the sustainable development of enterprises.

3. Suggestion

3.1. Suggestions for Tesla

Through the above analysis, our group demonstrates that information sharing positively affects an enterprise's overall supply chain optimization and sustainable operations. Based on this, we will focus on various supply chain stages in Tesla and other manufacturing enterprises and offer suggestions, respectively. For Tesla, there are four pieces of advice on its supply chain optimization.

First, increase supplier diversity: Tesla should try to find more suppliers to reduce its dependence on a single supplier and thus reduce potential supply shortages and stagnation issues.

Second, set up a more robust supply chain risk management system: Tesla should establish a complete supply chain risk management system to make information sharing more accessible so that potential supply chain problems can be identified and resolved in time, thus avoiding production disruptions and product quality issues.

Third, strengthen the cooperation with suppliers: Tesla should build a closer partnership with suppliers, including the joint development of production plans and optimization of production processes, to enhance the efficiency and flexibility of the supply chain.

Fourth, improve supply chain transparency: Tesla should improve transparency in its supply chain, including providing more information and data to suppliers and consumers better to understand the problems and opportunities in the supply chain [10].

3.2. Suggestions for Manufacturing Enterprises

As for other manufacturing enterprises like Tesla, here are several suggestions for our group.

For the front end of the supply chain, our group recommends that enterprises bring in information management systems, such as ERP and SCM systems, and create a shared platform. As a result, the ingredients information, the production status of products, and the completion status of orders can be shared in real-time. Related research shows that ERP system plays a significant role in financial management, performance commission, procurement management, order management, and inventory management. And information sharing is one of the most representative effects of an ERP system, and this can help enterprises optimize the structure of their supply chain and enhance information communication [11].

Our group recommends that enterprises build online sales platforms and allow reservations and orders for the sales segment. This can improve the vertical integration of the supply chain and decrease the cost of intermediaries. At the same time, this will effectively reduce the distortion of information caused by the time difference and also benefits enterprises in better understanding and

DOI: 10.54254/2754-1169/32/20231591

analyzing customer requirements. Consequently, it will be able to inform the warehouse to stock and ship promptly and also promote the rational distribution of resources. On the one hand, this initiative will reduce costs; on the other hand, this will also make it easier to win customers' favor by meeting their needs in time so that it can promote the sustainable development of enterprises.

For after-sales sessions, our group recommends that enterprises act according to their capacity. There is no doubt that Tesla has a unique advantage in the after-sales stage. Intelligent networks and sensors mean better car experience and information collection and represent higher research costs and capabilities. Based on this phenomenon, our team suggests that enterprises should do what they can do, but they can't disregard product updates and iterations just because of high costs. As all competitive advantages are temporary, the decline in profits due to research is also temporary. Therefore, we can maintain sustainable business operations only through continuous innovation and improvement.

4. Conclusion

Our study aims to discuss the beneficial effects of information sharing on front-end production, middle-end sales, and back-end after-sales. This impact is diverse in different sections, and the sharing and transfer of information in one department usually benefit another. For example, production information can guide the procurement of raw materials, optimize the process of production, and improve the quality of products; the middle-end sales information can guide production, improve after-sales services, and increase sales; the back end after-sales information can also help improve outcomes, optimize service and improve sales. Each link interacts with the other to form a benign closed loop so that the value of data can be fully utilized, and the benefits of information sharing will be maximal. At the same time, this paper also provides specific recommendations for different segments, such as bringing in relevant information systems, permitting part of customers to reserve, and measuring efforts to achieve digital transformation.

In the future, enterprises will be faced with more demanding challenges. With a systematic understanding of the benefits of information sharing for supply chain integration, it is still necessary for enterprises to develop a series of executable rules and regulations to fully safeguard the use of information sharing because of digital transformation. The full benefit of information sharing can enhance enterprises' competitiveness and promote sustainable development. Consequently, our group recommends that enterprises strengthen their cooperation with suppliers, improve the transparency of the supply chain and establish a complete supply chain management system so that enterprises can discover and deal with potential problems promptly and avoid production interruptions and product quality problems. While enhancing communication and cooperation with customers to improve customer satisfaction and loyalty, thus becoming the pillar of sustainable business development.

References

[1] *Li, R., Rao, J., Wan, L.: The digital economy, enterprise digital transformation, and enterprise innovation: MDE. Managerial and Decision Economics 43(7), 2875-2886 (2022).*

[2] *Chen, Y.: Analysis of the causes of supply chain bullwhip effect and its crack. Small and medium-sized enterprise management and technology 666(11), 149-151(2021).*

[3] *Ye, F., Li, Y., Zhang, H.: A study on the relationship between the factors influencing information sharing, information sharing degree and enterprise operation performance in the supply chain. Journal of Management 6(06), 743-750 (2009).*

[4] *Feng, S.: Study on the optimization of operation management of financial shared services in HR companies. Chongqing University, (2021).*

[5] *Liu, Y., Yin, F., Fu, X.: Analysis of information sharing mechanism in green supply chain management operation of food industry. Anhui Agricultural Science 39(14), 8805-8808 (2011).*

DOI: 10.54254/2754-1169/32/20231591

[6] *Han, F:. Analysis of strategic positioning and profitability model of Tesla Inc. Beijing University of Posts and Telecommunications, (2018).*
[7] *Wang, D., Cui, Z.: Open collaboration and independent innovation: Tesla open source and strategic opportunities for China's electric vehicle industry. Comparative Economic and Social Systems 179(03), 1-10 (2015).*
[8] *Abraham, A., Dutta, P., Mandal, J. K., Bhattacharya, A., Dutta, S.: Emerging technologies in data mining and information security. Proceedings of IEMIS-2018, (2018).*
[9] *Yue Yunfan. Research on business model innovation of new energy automobile industry. Huazhong University of Science and Technology, (2016).*
[10] *Zhou, H., Benton, C.: Supply chain practice and information sharing. Journal of Operations Management 25(6),1348-1365 (2007).*
[11] *Lee, H., Whang, S.: Information Sharing in a Supply Chain. International Journal of Technology Management 1(3-4), 79-93 (2000).*