UKS31143

by Rahul Sharma

General metrics

25,234	3,384	239	13 min 32 sec	26 min 1 sec
characters	words	sentences	reading time	speaking time

Score

86

This text scores better than 86% of all texts checked by Grammarly

Writing Issues

125		125
Issues left	Critical	Advanced

Unique Words

26%

unique words

Measures vocabulary diversity by calculating the percentage of words used only once in your document

Rare Words

43%

rare words

Measures depth of vocabulary by identifying words that are not among the 5,000 most common English words.

Word Length

Measures average word length

5.2

characters per word

Sentence Length

Measures average sentence length

14.2

words per sentence

UKS31143

2

Module Assessment – BMG814 The Digital Landscape

Assignment 1 - Case Study on E-Supply Chains

Table of Contents

1.0 Introduction

This report addresses the given four questions related to the area of modern supply chain management systems. In answering the questions, the report will consider real-world technological developments, changes and developments that are interlinked with the scope of the questions. This ensures the answers will be grounded in factual developments as well as sound theoretical knowledge, both of which will be represented through correct citations.

2.0 The Future of E-Supply Chains

2.1 Overview of the supply chain of the Future

The supply chains in the present day have become capable of more than a back-office function. This is evidenced in the developments at companies like Tesla, which has created a competitive market advantage for itself through vertical integration of supply chain systems. This creates control and ownership over production stages such as electric vehicle batteries, which are highly valuable to the firm's market growth (Naor, Coman and Wiznizer, 2021). Tesla also has an integrated retail sales channel that is linked to its supply chain system, allowing it to sell vehicles directly to buyers (Rassweiler and Brinley, 2014). This instance underlines the development of contemporary organisations and supply chain systems towards the future, as these developments at Tesla allow it to engage more quickly with customers and gather feedback directly as well (Wang et al., 2019). These functions at Tesla are fulfilled through the various technologies represented under the framework of Industry 4.0, which includes 9 different technologies such as artificial intelligence and cloud computing (Ortt, Stolwijk and Punter, 2020). In the long term, companies that develop matured expertise in using these technologies will become capable of meeting Industry 5.0 as a concept which is "primarily designed to enhance customer satisfaction" (Maddikunta et al., 2021). Through this preface, the topic of the question will now be addressed.

2.2 Delivering exact orders to customers at a location and time of their choice

Firstly, the exact order specifications of customers will be created on-demand using big data analytics to fulfil their needs promptly (Seyedan and Mafakheri, 2020). This will be achieved by using technologies for rapid production such as 3D printing, through which different consumer requirements can be fulfilled with precision (Jandyal et al., 2022). 3D printing is already capable of creating houses at a commercial scale (Garcia, 2023), and advancements in this technology will empower supply chains to create fully customised solutions for buyers.

Secondly, the use of digital technologies like machine learning will be incorporated across micro-segments of consumers to determine their buying habits, interests and other points of relevance (Ullah et al., 2023). This will allow the supply chain network to be agile and ready to launch new products, make changes as required and facilitate rapid delivery of consumer products (Oliveira-Dias, Maqueira Marín and Moyano-Fuentes, 2022). Present developments in companies such as Zara are already practising such strategies; Zara manufactures small lots of fashion products in a batching process that uses machine learning and data analytics of Zara stores to segment consumer markets locally (Nikolopoulos, 2022). This allows Zara to supply individual stores with the items that are in particular demand at that region or locality, presenting a real-world case where such technologies will develop further to increase supply chain responsiveness.

Thirdly, the location and time of delivery will be attended by developing connected cities with retail sector participation (World Economic Forum, 2020). This will ensure retail strategies such as dark stores can be equipped in cities, allowing for rapid delivery-only servicing of customer locations (Shapiro, 2022). Furthermore, the method of delivery itself can become more mobile through the use of drone technology for delivering to the end-user (Chen, Leon and Ractham, 2022). This ensures challenges of location or time are met satisfactorily, as the barriers of distance or location can be bypassed through drone-based delivery services.

3.0 Supply Chain 2040

3.1 Overview of the Global Supply Chain Challenges

The globalisation of business activities has increased the complexity of global trade, as firms become capable of outsourcing with greater ease. The growth of digital technology has also increased supply-side globalisation as it makes it easier to maintain real-time awareness and communications with various supply chain network partners (Hu and Haddud, 2017). However, it also increases the reliance on supply chain partners, as business operations are threatened when supply chains are affected at a macro scale. This was evidenced during the pandemic in 2020, which destabilised global supply chain systems and created awareness of the vulnerability of relying on overseas suppliers (Moosavi, Fathollahi-Fard and Dulebenets, 2022). This development led to other changes in the geopolitical context; for instance, semiconductor manufacturing is monopolised by Asian manufacturers like Taiwan's TSMC and others in Japan and China (Crawford et al., 2021). To counter this, the EU passed the European Chips Act to stimulate semiconductor manufacturing and reduce reliance on global suppliers (Kaur, 2022). These challenges present unique problems to global nations as outsourcing remains a cost-effective option across different industries. However, the disruption of global supply chain systems and monopolistic practices creates new challenges for global supply chain systems. Therefore, these challenges are ongoing and require innovative solutions, which will be discussed in the topic's context of digital technologies.

3.2 Supply chain risk management with predictive analysis

Predictive analysis uses data to determine patterns of risk behaviour based on historical records. The digitisation of supply chain activities provides ample data for forming effective data-driven patterns, which can be used as a reference for future indicators (Punia and Shankar, 2022). Through this awareness, any vulnerabilities in supply chain performance can be accounted for across different contexts. For instance, inventory management becomes more resilient as pattern-driven forecasting can allow for timely manufacturing to meet the immediate needs of consumers (Punia and Shankar, 2022). Logistics providers can anticipate potential blockages in traffic across roadways and seaways and plan accordingly to become secure against such potential disruptions (Seyedan and Mafakheri, 2020). Last-mile delivery services in particular benefit strongly from reduced risk through predictive analysis, as actions such as route optimisation and robotics ensure last-mile services are more sustainable and secure against risks.

3.3 Supply chain risk management with artificial intelligence

Artificial intelligence (AI) can be similarly used in a predictive capacity to mitigate risks in supply chain networks. Through AI, big data analysis becomes faster owing to the faster quantification of data patterns from AI technology (Dauvergne, 2020). This increases awareness of potential disruptive factors in supply chain networks, such as weather changes that can affect a particular region. AI can also analyse fast data from social media platforms to assess the objective impact of a disaster, incident or natural occurrence in any given area (Dauvergne, 2020). Through this fast data analysis, a greater level of supply chain awareness ensures any changes to business plans can be made in tandem with real-time developments (Bazzaz Abkenar et al., 2020). The increased transparency from both big data and fast data analysis increases the potential for automated interventions to be performed for addressing such disruptions (Deiva Ganesh and Kalpana, 2022).

4.0 8 Trends in Supply Chains

4.1 Overview of Sustainability in supply chain systems

Reusing and recycling have become key determinants of sustainability in a supply chain system. The emphasis on these qualities of sustainability has developed recently, owing to the global Net Zero 2050 directive (Marteau, Chater and Garnett, 2021). Under this, participating countries such as the UK, US and EU nations are committed to reducing net carbon emissions to a level of zero or carbon-neutral emissions (Marteau, Chater and Garnett, 2021). Therefore, reducing the carbon footprint from supply-side activities becomes imperative to accelerate the development of supply-chain sustainability, through which greater value-chain sustainability in businesses and society develops as well. The need to practise sustainability in this manner has been reflected in real-world practices by various companies. For instance, Zara recycles discarded apparel items delivered by customers in-store towards reusing their materials in the next batch of production (Abano, 2020). Tesla actively recycles precious metals from old electric vehicles, leading to a high level of recovery of precious metals like nickel, cobalt and iron (Crider, 2022). Future supply chain management towards incorporating key sustainability needs can be illustrated through the following subsections.

4.2 Incorporating reverse flows in future supply chains

Reverse flows in supply chain systems refer to the process of accepting product returns from customers, based on various reasons such as returning a defective product. The reverse flow allows companies to retain customers for the long term, as such a reverse flow creates customer retention through their satisfaction in being able to return unwanted products. Using artificial intelligence, the returns process across different products can be streamlined (Schlüter et al., 2021). This ensures time is utilised efficiently in sending returned products for repairs if needed, and to be sold as refurbished goods. This returns activity also has scope for recycling, as some returns will be incapable of being refurbished due to damage beyond repair. For instance, an apparel item may be torn beyond acceptable standards for reselling through refurbishment. Such items can be fast-tracked towards recycling to generate valuable raw material through such processing (Schlüter et al., 2021). The use of artificial intelligence will accelerate the efficiency and performance of reverse flows in these ways. The use of RFID tags in the returns processes improves the efficiency of reverse flows by allowing real-time tracing of returned items that are tagged with RFID numbers (Lee and Chan, 2009). In the future, token-based blockchain systems such as Ethereum will be widely used to create total transparency and sustainable supply chain system performance (Vadgama and Tasca, 2021).

4.3 Incorporating circular logistics in future supply chains

The circular supply chain is a framework for total sustainability that sees products being reused or recycled to generate raw materials for use in the value-chain operations. In this system, companies can collaborate with consumers to co-creating sustainable value through their participation in the returns processes of reverse flows (Hazen et al., 2020). The circular flow framework will be particularly beneficial for industries such as the fast fashion apparel industry, which generates waste materials and discarded apparel items that hold the potential for total sustainability. The circular economy therefore will continue to reuse materials from product recycling until it is degraded beyond reuse, allowing them to be sustainably disposed of outside of the loop (Alonso-Muñoz et al., 2022). This will reduce the unsustainable quality of business operations across diverse industries such as the fast fashion industry as well as the oil and gas industry. Recycled aviation fuel is another practice that will be highly valuable in creating sustainability and improving the environmental impact of global aviation developments, and companies such as Ryanair have begun incorporating such sustainably sourced aviation fuel (Barke et al., 2022).

5.0 Solving issues of delivery and returns in supply chain systems

5.1 Solving last-mile delivery issues with supply chain technology

Technologies can optimise and simplify the performance of last-mile delivery activities. Through technologies such as IoT, last-mile delivery vehicles can be monitored and tracked to make changes to traffic or weather issues (ctl.mit.edu, 2016). The use of artificial intelligence and machine learning technologies is significant in this context, as these technologies allow for analysis of route efficiency which increases the performance of real-world last mile activities. The use of electric vehicles in the future will also improve last-mile delivery services, as increasing technological developments aim to provide a greater level of mileage from a single charge (Automotive News Europe, 2022). This in turn reduces the driver's need to stop for refuelling during deliveries, reducing a further point of inefficiency from last-mile delivery services (Automotive News Europe, 2022). Customers can also make delivery scheduling for options such as customised delivery times and in-person pick up instead of delivery to their premises. Automating these functions reduces the last-mile length between the despatch of the goods and delivery to the end-user. The aforementioned instances such as blockchain tracing are also applicable here, and other technologies like IoT allow the customer to track their deliveries in real-time to their satisfaction (Vadgama and Tasca, 2021). Through these data analytics and customer-centric approaches, last-mile deliveries become empowered to leave a positive impression of customer satisfaction caused by offering them a higher degree of customised delivery services.

5.2 Solving product returns issues with supply chain technology

Product returns issues have developed further in recent years owing to the growth of digital commerce shopping channels. As e-commerce creates a physical distance between the customer and the product, the customer is unable to try the product or view it in person before making the purchase decision. This results in a higher degree of product returners for products purchased across e-commerce, compared to in-store purchases. Therefore, the growing issue can be solved by tagging the products with digital tokens which allows them to be traced across the returns journey. This ensures wastage does not occur, such as unaccounted loss during the return transit. Technological platforms such as Returns Management Systems will automate many return functions, thereby increasing the efficiency of the returns processes (Muduli et al., 2023). Ultimately, using digital technology will create a frictionless return experience that will enhance customer satisfaction, leading to customer loyalty and improved business performance for the firm.

6.0 Conclusion

The report addressed each of the topic questions through the scope of digital technologies that are available today, as well as future frameworks such as Industry 5.0. By citing instances from real-world companies like Zara and Tesla, the theoretical discussion in the report was grounded in factual observation of real-world companies.

References

Abano, J. (2020). Uniqlo joins Zara, H&M in tackling garment waste problem. [online] Inside Retail. Available at: https://insideretail.asia/2020/10/06/uniqlo-joins-zara-hm-in-tackling-garment-waste-problem/ [Accessed 6 Apr. 2023].

Alonso-Muñoz, S., González-Sánchez, R., Siligardi, C. and García-Muiña, F.E. (2022). Analysis of the Textile Supply Chain from a Circularity Perspective: A

Case Study. Eurasian Studies in Business and Economics, [online] 21, pp.213–234. doi:https://doi.org/10.1007/978-3-030-94036-2_12.

Automotive News Europe (2022). Why million mile batteries are the future for EVs. [online] Automotive News Europe. Available at: https://europe.autonews.com/guest-columnist/why-million-mile-batteries-are-future-evs [Accessed 6 Apr. 2023].

Barke, A., Bley, T., Thies, C., Weckenborg, C. and Spengler, T.S. (2022). Are Sustainable Aviation Fuels a Viable Option for Decarbonizing Air Transport in Europe? An Environmental and Economic Sustainability Assessment. Applied Sciences, [online] 12(2), p.597. doi:https://doi.org/10.3390/app12020597.

Bazzaz Abkenar, S., Haghi Kashani, M., Mahdipour, E. and Mahdi Jameii, S. (2020). Big data analytics meets social media: A systematic review of techniques, open issues, and future directions. Telematics and Informatics, [online] 57, p.101517. doi:https://doi.org/10.1016/j.tele.2020.101517.

Chen, C., Leon, S. and Ractham, P. (2022). Will customers adopt last-mile drone delivery services? An analysis of drone delivery in the emerging market economy. Cogent Business & Management, [online] 9(1). doi:https://doi.org/10.1080/23311975.2022.2074340.

Crawford, A., Dillard, J., Fouquet, H. and Reynolds, I. (2021). The World Is Dangerously Dependent on Taiwan for Semiconductors. Bloomberg.com. [online] 25 Jan. Available at: https://www.bloomberg.com/news/features/2021-01-25/the-world-is-dangerously-dependent-on-taiwan-for-semiconductors [Accessed 6 Apr. 2023].

Crider, J. (2022). Tesla's Recycled Batteries: Almost 92% Reuse Of Raw Materials. [online] CleanTechnica. Available at: https://cleantechnica.com/2022/05/08/teslas-recycled-batteries-almost-92-reuse-of-raw-materials/ [Accessed 6 Apr. 2023].

ctl.mit.edu (2016). MIT Team Uses Big Data, IoT to Speed Up 'Last Mile' Deliveries. [online] ctl.mit.edu. Available at: https://ctl.mit.edu/news/mit-team-uses-big-data-iot-speed-last-mile-deliveries [Accessed 6 Apr. 2023].

Dauvergne, P. (2020). Is artificial intelligence greening global supply chains? Exposing the political economy of environmental costs. Review of International Political Economy, [online] 29(3), pp.1–23. doi:https://doi.org/10.1080/09692290.2020.1814381.

Deiva Ganesh, A. and Kalpana, P. (2022). Future of artificial intelligence and its influence on supply chain risk management – A systematic review. Computers & Industrial Engineering, [online] 169, p.108206. doi:https://doi.org/10.1016/j.cie.2022.108206.

Garcia, E. (2023). 3D printing reaches new heights with two-story home. Reuters. [online] 12 Jan. Available at: https://www.reuters.com/technology/3d-printing-reaches-new-heights-with-two-story-home-2023-01-12/ [Accessed 6 Apr. 2023].

Hazen, B.T., Russo, I., Confente, I. and Pellathy, D. (2020). Supply chain management for circular economy: conceptual framework and research agenda. The International Journal of Logistics Management, [online] 32(2). doi:https://doi.org/10.1108/ijlm-12-2019-0332.

Hu, J. and Haddud, A. (2017). Exploring the Impact of Globalization and Technology on Supply Chain Management. International Journal of Operations Research and Information Systems, [online] 8(4), pp.1–22. doi:https://doi.org/10.4018/ijoris.2017100101.

Jandyal, A., Chaturvedi, I., Wazir, I., Raina, A. and Ul Haq, M.I. (2022). 3D printing – A review of processes, materials and applications in industry 4.0. Sustainable Operations and Computers, [online] 3, pp.33–42. doi:https://doi.org/10.1016/j.susoc.2021.09.004.

Kaur, D. (2022). The €43 Billion EU Chips Act gets green light. [online] TechHQ. Available at: https://techhq.com/2022/11/the-e43-billion-eu-chips-act-gets-green-light-from-european-nations-whats-next/ [Accessed 6 Apr. 2023].

Lee, C.K.M. and Chan, T.M. (2009). Development of RFID-based Reverse Logistics System. Expert Systems with Applications, [online] 36(5), pp.9299–9307. doi:https://doi.org/10.1016/j.eswa.2008.12.002.

Maddikunta, P.K.R., Pham, Q.-V., B, P., Deepa, N., Dev, K., Gadekallu, T.R., Ruby, R. and Liyanage, M. (2021). Industry 5.0: A survey on enabling technologies and potential applications. Journal of Industrial Information Integration, [online] 26, p.100257. doi:https://doi.org/10.1016/j.jii.2021.100257.

Marteau, T.M., Chater, N. and Garnett, E.E. (2021). Changing behaviour for net zero 2050. BMJ, [online] 375. doi:https://doi.org/10.1136/bmj.n2293.

Moosavi, J., Fathollahi-Fard, A.M. and Dulebenets, M.A. (2022). Supply chain disruption during the COVID-19 pandemic: Recognizing potential disruption management strategies. International Journal of Disaster Risk Reduction, [online] 75, p.102983. doi:https://doi.org/10.1016/j.ijdrr.2022.102983.

Muduli, K., Luthra, S., Garza-Reyes, J.A. and Huisingh, D. (2023). Application of blockchain technology for addressing reverse logistics challenges: current status and future opportunities. Supply Chain Forum: An International Journal, [online] 24(1), pp.1–6. doi:https://doi.org/10.1080/16258312.2023.2165279.

Naor, M., Coman, A. and Wiznizer, A. (2021). Vertically Integrated Supply Chain of Batteries, Electric Vehicles, and Charging Infrastructure: A Review of Three Milestone Projects from Theory of Constraints Perspective. Sustainability, [online] 13(7), p.3632. doi:https://doi.org/10.3390/su13073632.

Nikolopoulos, S. (2022). H&M, Zara, Fast Fashion Turn to Artificial Intelligence to Transform the Supply Chain. [online] www.thomasnet.com. Available at:

https://www.thomasnet.com/insights/zara-h-m-fast-fashion-ai-supply-chain/ [Accessed 6 Apr. 2023].

Oliveira-Dias, D. de, Maqueira Marín, J.M. and Moyano-Fuentes, J. (2022). Lean and agile supply chain strategies: the role of mature and emerging information technologies. The International Journal of Logistics Management, [online] 33(5), pp.221–243. doi:https://doi.org/10.1108/ijlm-05-2022-0235.

Ortt, R., Stolwijk, C. and Punter, M. (2020). Implementing Industry 4.0: assessing the current state. Journal of Manufacturing Technology Management, [online] 31(5). doi:https://doi.org/10.1108/jmtm-07-2020-0284.

Punia, S. and Shankar, S. (2022). Predictive analytics for demand forecasting: A deep learning-based decision support system. Knowledge-Based Systems, [online] 258. doi:https://doi.org/10.1016/j.knosys.2022.109956.

Rassweiler, A. and Brinley, S. (2014). Sharing insights elevates their impact. [online] S&P Global. Available at: https://www.spglobal.com/mobility/en/research-analysis/q14-tesla-motors-a-case-study-in-disruptive-innovation.html [Accessed 6 Apr. 2023].

Schlüter, M., Lickert, H., Schweitzer, K., Bilge, P., Briese, C., Dietrich, F. and Krüger, J. (2021). AI-enhanced Identification, Inspection and Sorting for Reverse Logistics in Remanufacturing. Procedia CIRP, [online] 98, pp.300–305. doi:https://doi.org/10.1016/j.procir.2021.01.107.

Seyedan, M. and Mafakheri, F. (2020). Predictive big data analytics for supply chain demand forecasting: methods, applications, and research opportunities. Journal of Big Data, [online] 7(1). doi:https://doi.org/10.1186/s40537-020-00329-2.

Seyedan, M. and Mafakheri, F. (2020). Predictive big data analytics for supply chain demand forecasting: methods, applications, and research opportunities.

Journal of Big Data, [online] 7(1). doi:https://doi.org/10.1186/s40537-020-00329-2.

Shapiro, A. (2022). Platform urbanism in a pandemic: Dark stores, ghost kitchens, and the logistical-urban frontier. Journal of Consumer Culture, [online] 23(1). doi:https://doi.org/10.1177/14695405211069983.

Ullah, A., Mohmand, M.I., Hussain, H., Johar, S., Khan, I., Ahmad, S., Mahmoud, H.A. and Huda, S. (2023). Customer Analysis Using Machine Learning-Based Classification Algorithms for Effective Segmentation Using Recency, Frequency, Monetary, and Time. Sensors, [online] 23(6), p.3180. doi:https://doi.org/10.3390/s23063180.

Vadgama, N. and Tasca, P. (2021). An Analysis of Blockchain Adoption in Supply Chains Between 2010 and 2020. Frontiers in Blockchain, [online] 4. doi:https://doi.org/10.3389/fbloc.2021.610476.

Wang, X., Leng, M., Song, J., Luo, C. and Hui, S. (2019). Managing a supply chain under the impact of customer reviews: A two-period game analysis. European Journal of Operational Research, [online] 277(2), pp.454–468. doi:https://doi.org/10.1016/j.ejor.2019.02.033.

World Economic Forum (2020). The Future of the Last-Mile Ecosystem. [online] World Economic Forum. Available at: https://www.weforum.org/reports/the-future-of-the-last-mile-ecosystem/ [Accessed 6 Apr. 2023].