Global Business and Management Research: An International Journal
Vol. 16, No. 4s (2024)

Effects of big data analytics on supply chain visibility and supply chain high adaptability on mass customization capabilities

Yajing Lu
School of Management, Universiti Sains Malaysia, Malaysia
Email: luyajing@student. usm.my

Noorliza Karia *
School of Management, Universiti Sains Malaysia, Malaysia
Email: noorliza@usm.my

Meijing Song
School of Management, Universiti Sains Malaysia, Malaysia
Email: songmeijing@student.usm.my

** Corresponding Author*

Abstract
Purpose: This paper aims to address demand uncertainty and present a conceptual model regarding the influencing factors of mass customization capabilities in small and medium-sized production companies.
Design/methodology/approach: Based on previous studies, this study examines how supply chain visibility, big data analytics, and high adaptability improve small and medium-sized businesses' capacity for mass customization.
Findings: This paper identifies a relationship between big data analytics, supply chain visibility, high adaptability, and mass customization capabilities.
Research limitations/implications: This paper has limitations as it only presents a framework. Data validation can be conducted using surveys or other methods in future work.
Practical implications: This paper provides a way to enhance the large-scale customization capabilities of small and medium-sized businesses.
Originality/value: The purpose of this study is to pinpoint a measure for improving small and medium-sized businesses' capacity for mass customization. The role of big data analytics, supply chain visibility, and high adaptability in improving mass customization capabilities is also emphasized.

Keywords: Big Data Analytics (BDA), Supply Chain Visibility (SCV), Supply Chain High Adaptability (SCHA), Mass Customization Capabilities (MCC)

Introduction

Mass customization (MC) is a commercial tactic that utilizes big data analytics (BDA) to provide tailored solutions efficiently and promptly aligning with distinct customer demands. This approach enhances supply chain visibility (SCV) and adaptability, effectively addressing uncertainties with a strong emphasis on the central role of the customer. Nevertheless, in recent years, small and medium-sized enterprises (SMEs) efforts to deploy mass customization (MC) have encountered a number of roadblocks. These challenges include a limited grasp of existing system reforms, inadequate supplier support as pointed out by Ullah (2020), a deficiency in

cross-functional management personnel, insufficient management support, and a shortage of information technology (IT), as emphasized by Jain et al. (2021). Clearly, SMEs have not yet reached the degree of mass customization capabilities (MCC) necessary to satisfy contemporary market demands. Therefore, businesses must harness the power of the BDA and strengthen their collaboration within the supply chain to guarantee the precise delivery of products and services to their customers. Simultaneously, supply chain collaboration demands both SCV and swift responsiveness, essential elements for delivering exceptional value to supply chain associates as well as the company itself. The supply chain's openness is a requirement of the SCV since it makes it easier to depict changes in supply and demand. At the same time, the supply chain needs to be able to react quickly in order to maintain customer service standards.

Theoretical Background

In the pursuit of bolstering the MCC of the SMEs, the organizational prerequisites for the MC take center stage. In the current business environment, the MC has become an important capability for businesses of all sizes (Taps et al., 2016). It enables businesses to effectively respond to diverse customer demands and gain a competitive advantage in the supply chain (Wu et al., 2016; Murat Kristal et al., 2010). However, for the SMEs, achieving this capability faces numerous obstacles.

Some studies suggest that SMEs encounter various difficulties when implementing MC, such as a lack of understanding of changes to existing systems, insufficient supplier support (Ullah, 2020), a shortage of multifunctional managers, inadequate management support, and limited information technology (Jain et al., 2021).

Investigating the factors that enhance the MCC of the SMEs is crucial in the academic field, as it provides insights into the specific challenges these enterprises face when adapting to modern business models. From a practical perspective, addressing these issues can help the SMEs improve operational efficiency and their ability to meet diverse customer needs. The main research question of this study explores the impact of the BDA, SCV and SCHA on enhancing the MCC of SMEs.

Based on the Resource-Based View (RBV), this study considers the BDA as a key resource for effectively enhancing the MCC. When combined with specific business operations, it can develop different capabilities, enabling the SMEs to improve the MCC and enhance the performance. According to the Dynamic Capabilities Theory (DCT), enterprises must possess adaptability and learning capabilities to respond to the ever-changing market environment and challenges posed by competitors. This study focuses on the ability to achieve information sharing through visualization techniques, enhancing innovation capabilities, and meeting customer needs with high adaptability, thereby increasing the competitiveness of the SMEs in the supply chain.

In Figure 1, the theoretical model is displayed, where supply chain high adaptability is the abbreviation of SCHA and big data analytics is the abbreviation for BDA.

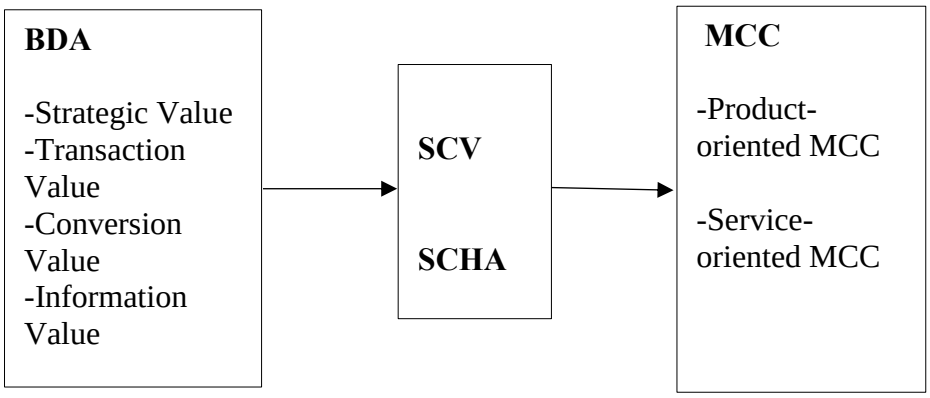

Figure 1: Research Framework

Firstly, it assumes that a company's MCC is directly impacted by two key organizational practices: the SCV and SCHA. The foundational components of the proposed model structure are demonstrated as follows, including the definitions of various constructs, the core principles connecting them, and the hypotheses generated from this.

Big Data Analytics

The rapid pace of globalization, digitization, knowledge sharing, information dissemination, and increased competition have unquestionably reshaped business models (Bouwman et al., 2018).

Nowadays, big data is widely recognized as one of the foundational elements of technology. With the exception of huge corporations, the SMEs are actively looking into ways to improve production efficiency and competitive position in the market. (Song et al., 2022; Ghobakhloo et al., 2012).

This provides SMEs with additional business benefits and possibilities that have the potential to generate exceptional company value. (Raguseo and Vitari, 2018), including values for strategy, transactions, change, and information. Decision factors of the BDA from environmental, technological, and organizational perspectives validated by Youssef et al. (2022), Maroufkhani and Tseng et al. (2020), as well as Maroufkhani and Wan Ismail et al. (2020). Compatibility, complexity, organizational preparation, and top management support are critical considerations, according to Maroufkhani and Iranmanesh et al. (2021). The big data by the SMEs is expected to reduce production costs (Saleem et al. ,2020). Furthermore, the BDA is expected to enhance various aspects including financial performance, operational performance, and market performance among others (Saleem et al., 2020; Maroufkhani et al., 2020). The BDA significantly improves the knowledge capabilities of the SMEs through enhancing data governance, management, and business strategies. This technology facilitates the digitization of processes and internal workings, leading to increased efficacy and efficiency. Furthermore, it plays a crucial part in reshaping business models and guaranteeing long-term business sustainability (Akpan et al., 2020; Coleman et al., 2016; Mangla et al., 2021).

Supply Chain Visibility

Currently, the 'SCV' has gained prominence within the domain of supply chain administration. However, various scholars put forth different definitions and interpretations based on their research perspectives, resulting in conceptual diversity (Roy et al., 2021; Kalaiarasan et al., 2022; Wei et al., 2010). Another widely accepted perspective regards the SCV as an organizational capability based on Barratt and Oke's (2007) research. According to the

resource-based view, 'the degree to which supply chain participants obtain or exchange information that is deemed essential to their own operational activities and is characterized by mutual benefits' is the definition of the supply chain value, or SCV. This definition emphasizes increasing visibility by enhancing the availability of information. Through case studies, it discovers that the deployment of a specific set of resources and mechanisms can enhance the SCV and operational performance. Furthermore, Barratt et al. (2007) noted that visibility displays distinct characteristics in different strategic relationships. The SCV is regarded as fostering a range of capabilities to tackle issues and challenges within the supply chain system, ultimately leading to economic and sustainable performance.

The achievement of visibility helps alleviate coordination and communication pressures among organizations, thus enhancing operational efficiency and planning effectiveness (Swift et al., 2019).

Supply Chain High Adaptability

Hu and Ma (2020) introduced the concept of the SCHA. It pertains to a supply chain's requirement to encompass adaptable responsiveness for rapid changes, efficient low-cost functionality, and flexible capabilities to adjust to evolving supply chain management priorities. To effectively address the uncertainty in supply and demand, businesses need to establish a responsive supply chain that can swiftly respond to short-term fluctuations originating from both the supply and demand sides. To reduce costs, businesses need to build an efficient supply chain to ensure the smooth and cost-effective operation of the supply chain. Additionally, companies must have a flexible supply chain that can quickly shift the focus of supply chain management when market structures change to adapt to significant changes in the business environment. Clearly, traditional supply chains often struggle to possess all these characteristics simultaneously, making them less adaptable to the current business environment. In this paper, core enterprises within the supply chain need to leverage various technologies of the digital age to build highly adaptable supply chains with new features to avoid becoming obsolete in the era.

Mass Customization Capabilities

From the perspective of the SMEs, the MC is a business strategy aimed at economically meeting customers' unique needs with affordability and timeliness (Ullah and Narain, 2020). Adopting the MC is seen as a means of reducing environmental uncertainty by providing clients with unique goods and services and changing the company into a customer-centric one. (Trentin et al., 2019; Suzić et al., 2018). The MCC is the capacity of the SMEs to deliver personalized goods or services at a larger scale and increased speed compared to mass manufacturing. Consequently, it has become a crucial element impacting competitive advantage in unpredictable and fiercely competitive marketplaces (Qi et al., 2020) and represented a fundamental capability for adapting to unpredictable market conditions (Taps et al., 2016). Enterprises with the MCC have a competitive advantage in supply chain competition (Wu et al., 2016; Murat Kristal et al., 2010). Obviously, the MCC require businesses to accurately identify customer demands and order quantities. This enables a company's supply chain to respond to diverse customer needs consistently and swiftly, allowing for the design, production, and delivery of large batches of differentiated products or services at prices, costs, delivery schedules, and quality levels comparable to those of mass production. This should be achieved without excess inventory or sales losses, ultimately satisfying specific customer requirements. The MCC suggests that the successful MC systems should have the capacity to respond to customization demands, operate efficiently, and adapt to changing requirements effectively.

SCV plays a crucial role in the BDA and MCC

SCV is facilitated through the real-time exchange of information, enhancing collaborative supply chain practices and strengthening the MCC in turn. To achieve this goal, organizations must promote deep customer engagement and ensure that customer-specific demand information can be accurately and swiftly communicated internally within the organization. Therefore, organizations need to prioritize the establishment of strong customer relationships to attain demand visibility. This emphasizes the significance of Information Processing Theory(IPT) in the MC (Shi et al., 2022). Meanwhile, the research conducted by Sandrin et al. (2018) also highlighted that the full attention to the BDA might not be garnered unless MCC are enhanced. They argue that achieving a competitive advantage is a necessary condition for businesses, and this is contingent upon the support of the SCV and substantial improvement in the MCC. In the realm of supply chain, the BDA plays a paramount role in enhancing both the SCV and MCC.

To achieve customer demand visibility, information should be filtered and processed into a high-quality format that can circulate within the organization to meet the organization's needs. This can be typically achieved through techniques such as data extraction and cleaning (Jimenez-Marquez et al., 2019). Enhancing demand visibility helps businesses consistently acquire and maintain valuable customer demand information. By presenting demand information in a clear and standardized manner within the system, different departments can swiftly access, process, and leverage this information to make informed decisions.

SCHA plays a significant role in the BDA and MCC

High adaptability in the supply chain implies that businesses can flexibly meet personalized demands, achieve cost-effective manufacturing, and adapt to shifting supply chain priorities. This enhances the MCC in turn. To achieve this goal, organizations must gain a deep understanding of customer demand data, analyze customer preferences, and implement mass production strategies to adapt to evolving customer demands and the uncertain supply chain environment. Therefore, organizations must acquire and analyze data in real-time to assist in achieving high adaptability. Kim et al. (2014) observed that concerning market responsiveness, coordination among supply chain partners was vital for an organization's competitive advantage. This facilitates flexible assembly operations and enhances collaboration efficiency among suppliers. Che et al. (2012) argued that effectively harnessing an organization's core capabilities and resource integration to address order fluctuations and sustain manufacturing capacity requires efficiently providing customers with a variety of personalized products. Lu et al. (2012) suggested that to improve an enterprise's manufacturing system's responsiveness to the market, it is essential to have efficient and accurate work-hour standards, particularly in the context of the MC. Research by Nawanir et al. (2020) found that enterprises with higher flexibility could attain high adaptability by adjusting production levels and coordinating production systems when responding to changes in customer demands for various product combinations. They believed that supply chain responsiveness, efficiency, and flexibility could all assist enterprises in achieving the MC, enhancing their competitiveness consequently. They also believed that supply chain responsiveness, efficiency, and flexibility could all help enterprises achieve the MC, thereby enhancing competitiveness. These factors collectively constitute the elements of the SCHA, enabling businesses to excel in rapidly changing market environments.

To achieve high adaptability in the supply chain, organizations need to leverage the support of innovative technologies. By utilizing data technology, it is possible to predict the market and sense market trends more accurately, enabling the provision of superior goods and services to the target market (Gupta et al., 2020). Enhancing the responsiveness, productivity, and

flexibility of the supply chain aids in the efficient utilization of data, ultimately resulting in improved customer satisfaction.

For organizations that have integrated data-driven decision-making into their corporate culture, the entire workforce has developed a sensitivity to data over the long term of working with data. As a result, they are more likely to embrace and leverage the rich information that big data provides to support decision-making, rather than relying solely on past experiences (Yu et al., 2018). However, for the SMEs, not all resources may be readily accessible. Nevertheless, the big data can assist organizations in continuously analyzing the operational activities of customers and suppliers, thereby driving and improving internal decision-making and planning within the organization (Wei et al., 2010). Given the reality, the SMEs should embrace the BDA to enhance the SCV and fortify the MCC. Akter et al. (2016) and Wamba et al. (2020) also argued that the application of the big data can enhance the accuracy of demand forecasting for businesses.

Methods

This study will subsequently focus on Chinese technology-oriented SMEs as its research subjects. These technology-oriented SMEs typically offer high-tech products or services, making them well-positioned to achieve MC. Using a questionnaire survey method to collect relevant data will provide validation of the aforementioned relationships.

Discussion and Conclusion

The research in this paper indicates that there is a relationship between the BDA, SCV, SCHA, and MCC. This relationship is facilitated through the adoption of innovative big data technologies to mitigate knowledge and information opacity among supply chain partners, enhance responsiveness and efficiency between downstream and upstream, and adapt to changes swiftly in demand. In alignment with the viewpoint of Organizational Information Processing Theory (OIPT), Sheng et al. (2021) described the relationship between the BDA and MCC as an information processing capability-capability relationship. This relationship aids in the swift adaptation to market demands and the acquisition of a benefit over competitors (Galbraith, 1974; Srinivasan and Swink, 2018). From this perspective, the MCC can be seen as an internally focused capability within the organization, while the SCV and SCHA are externally focused capabilities. The expansion of internal capacities is driven by changes in the external technological environment. A traditional production model organization can also operate within a visible and highly adaptable supply chain system. However, it is crucial for an organization that practices the MC, data visibility and an efficient supply chain. This further affirms the role of the SCV and SCHA in MCC, as they address the needs of organizations confronting rapidly and changing market demands.

Theoretical Implications

In most cases, it is expected that the conceptual model proposed in this paper provides insightful information for scholars and practitioners, unveiling the potential advantages of data capabilities and supply chain competencies frameworks in the context of the MCC.

Limitations and Suggestions for Future Research

However, this paper does not take empirical analysis. In future research, we intend to collect relevant data of the SMEs to accurately validate and support the viewpoints and models proposed in this paper. Besides, we will provide a more comprehensive and reliable foundation for our study to reinforce and solidify the theoretical framework, which will make a more

impactful contribution on the field of the SMEs through meticulous data collection and analysis.

Acknowledgement

We wish to extend our heartfelt gratitude once more to the reviewers and editors for their unwavering dedication. We appreciate their persistence in meticulously revising this document, tirelessly contributing to its eventual refinement.

References

Akpan, I. J., Udoh, E. A. P., & Adebisi, B. (2020). Small business awareness and adoption of state-of-the-art technologies in emerging and developing markets, and lessons from the COVID-19 pandemic. *Journal of Small Business & Entrepreneurship*, *34*(2), 1-18. https://doi.org/10.1080/08276331.2020.1820185

Akter, S., Wamba, S. F., Gunasekaran, A., Dubey, R., & Childe, S. J. (2016). How to improve firm performance using big data analytics capability and business strategy alignment? *International Journal of Production Economics*, *182*(1), 113-131. https://doi.org/10.1016/j.ijpe.2016.08.018

Barratt, M., & Oke, A. (2007). Antecedents of supply chain visibility in retail supply chains: A resource-based theory perspective. *Journal of Operations Management*, *25*(6), 1217-1233. https://doi.org/10.1016/j.jom.2007.01.003

Bouwman, H., Nikou, S., Molina-Castillo, F. J., & de Reuver, M. (2018). The impact of digitalization on business models. *Digital Policy, Regulation and Governance*, *20*(2), 105-124. https://doi.org/10.1108/dprg-07-2017-0039

Che, J. H., Zeng, Q., & Zhang, S. Y. (2012). Study on cloud-based service platform for mass customization. *Advanced Materials Research*, 479-481, 98-101. https://doi.org/10.4028/www.scientific.net/amr.479-481.98

Coleman, S., Göb, R., Manco, G., Pievatolo, A., Tort-Martorell, X., & Reis, M. S. (2016). How can SMEs benefit from big data? challenges and a path forward. *Quality and Reliability Engineering International*, *32*(6), 2151-2164. https://doi.org/10.1002/qre.2008

Galbraith, J. R. (1974). Organization design: An information processing View. *Interfaces*, *4*(3), 28-36. https://doi.org/10.1287/inte.4.3.28

Ghobakhloo, M., Hong, T. S., Sabouri, M. S., & Zulkifli, N. (2012). Strategies for successful information technology adoption in small and medium-sized enterprises. *Information*, *3*(1), 36-67. https://doi.org/10.3390/info3010036

Gupta, S., Drave, V. A., Dwivedi, Y. K., Baabdullah, A. M., & Ismagilova, E. (2020). Achieving superior organizational performance via big data predictive analytics: A dynamic capability view. *Industrial Marketing Management*, 90(1). https://doi.org/10.1016/j.indmarman.2019.11.009

Hu, H., & Ma, S. (2020). Empirical study on the impact of market sensing, alignment and innovation on supply chain high-adaptability. *Chinese Journal of Management.*, *17*(1), 131-138. doi:10.3969/i.issn.1672-884x.2020.01.015

Jain, P., Garg, S., & Kansal, G. (2021). A TISM approach for the analysis of enablers in implementing mass customization in Indian manufacturing Units. *Production Planning & Control*, 1-16. https://doi.org/10.1080/09537287.2021.1900616

Jimenez-Marquez, J. L., Gonzalez-Carrasco, I., Lopez-Cuadrado, J. L., & Ruiz-Mezcua, B. (2019). Towards a big data framework for analyzing social media content. *International Journal of Information Management*, *44*, 1-12. https://doi.org/10.1016/j.ijinfomgt.2018.09.003

Kalaiarasan, R., Olhager, J., Agrawal, T. K., & Wiktorsson, M. (2022). The ABCDE of supply chain visibility: A systematic literature review and framework. International Journal of Production Economics, *248*, 108464. https://doi.org/10.1016/j.ijpe.2022.108464

Kim, B. (2014). Effective supply chain strategy to enhance firm's responsiveness: Empirical evidence from the BMW Leipzig plant. *International Journal of Services and Operations Management*, *18*(1), 21-37. https://doi.org/10.1504/ijsom.2014.060449

Liu, G. (Jason), Shah, R., & Schroeder, R. G. (2010). Managing demand and supply uncertainties to achieve mass customization ability. *Journal of Manufacturing Technology Management*, *21*(8), 990-1012. https://doi.org/10.1108/17410381011086801

Lu, X. (2012). *Research on the Method of Establishing Work Time Quotas for Product Family Parts in the MC Environment*.

Mangla, S. K., Raut, R., Narwane, V. S., Zhang, Z. (Justin), & priyadarshinee, P. (2020). Mediating effect of big data analytics on project performance of small and medium enterprises. *Journal of Enterprise Information Management(ahead-of-print)*. https://doi.org/10.1108/jeim-12-2019-0394

Maroufkhani, P., Iranmanesh, M., & Ghobakhloo, M. (2022). Determinants of big data analytics adoption in small and medium-sized enterprises (SMEs). *Industrial Management & Data Systems*, *123*(1), 278-301. https://doi.org/10.1108/imds-11-2021-0695

Maroufkhani, P., Tseng, M.-L., Iranmanesh, M., Ismail, W. K. W., & Khalid, H. (2020). Big data analytics adoption: Determinants and performances among small to medium-sized enterprises. *International Journal of Information Management*, *54*(1), 102190. https://doi.org/10.1016/j.ijinfomgt.2020.102190

Maroufkhani, P., Wan Ismail, W. K., & Ghobakhloo, M. (2020). Big data analytics adoption model for small and medium enterprises. *Journal of Science and Technology Policy Management* (*ahead-of-print)*. https://doi.org/10.1108/jstpm-02-2020-0018

Murat Kristal, M., Huang, X., & Schroeder, R. G. (2010). The effect of quality management on mass customization capability. *International Journal of Operations & Production Management*, *30*(9), 900-922. https://doi.org/10.1108/01443571011075047

Nawanir, G., Lim, K. T., Ramayah, T., Mahmud, F., Lee, K. L., & Maarof, M. G. (2020). Synergistic effect of lean practices on lead time reduction: Mediating role of manufacturing flexibility. *Benchmarking: An International Journal*, *27*(5), 1815-1842. https://doi.org/10.1108/bij-05-2019-0205

Qi, Y., Mao, Z., Zhang, M., & Guo, H. (2020). Manufacturing practices and servitization: The role of mass customization and product innovation capabilities. *International Journal of Production Economics*, *228*, 107747. https://doi.org/10.1016/j.ijpe.2020.107747

Raguseo, E., & Vitari, C. (2018). Investments in big data analytics and firm performance: An empirical investigation of direct and mediating effects. *International Journal of Production Research*, *56*(15), 5206-5221. https://doi.org/10.1080/00207543.2018.1427900

Roy, V. (2021). Contrasting supply chain traceability and supply chain visibility: Are they interchangeable? *The International Journal of Logistics Management(ahead-of-print)*. https://doi.org/10.1108/ijlm-05-2020-0214

Saleem, H., Li, Y., Ali, Z., Mehreen, A., & Mansoor, M. S. (2020). An empirical investigation on how big data analytics influence China SMEs performance: do product and process innovation matter? *Asia Pacific Business Review*, *26*(5), 537–562. https://doi.org/10.1080/13602381.2020.1759300

Sandrin, E., Trentin, A., & Forza, C. (2018). Leveraging high-involvement practices to develop mass customization capability: A contingent configurational perspective. *International*

Journal of Production Economics, *196*, 335-345. https://doi.org/10.1016/j.ijpe.2017.12.005

Sheng, H., Feng, T., Chen, L., & Chu, D. (2021). Responding to market turbulence by big data analytics and mass customization capability. *Industrial Management & Data Systems*, *121*(12), 2614-2636. https://doi.org/10.1108/imds-03-2021-0160

Shi, H. (2022). *A Study on the Effects of Dynamic Capabilities and Supply Chain Resilience on the Capability for Mass Customization.*

Song, J., Xia, S., Vrontis, D., Sukumar, A., Liao, B., Li, Q., Tian, K., & Yao, N. (2022). The Source of SMEs' Competitive Performance in COVID-19: Matching Big Data Analytics Capability to Business Models. *Information Systems Frontiers.* https://doi.org/10.1007/s10796-022-10287-0

Srinivasan, R., & Swink, M. (2018). An investigation of visibility and flexibility as complements to supply chain analytics: An organizational information processing theory perspective. *Production and Operations Management*, *27*(10), 1849-1867. https://doi.org/10.1111/poms.12746

Suzić, N., Forza, C., Trentin, A., & Anišić, Z. (2018). Implementation guidelines for mass customization: current characteristics and suggestions for improvement. *Production Planning & Control*, *29*(10), 856-871. https://doi.org/10.1080/09537287.2018.1485983

Swift, C., Guide, V. D. R., & Muthulingam, S. (2019). Does supply chain visibility affect operating performance? Evidence from conflict minerals disclosures. *Journal of Operations Management*, *65*(5), 406-429. https://doi.org/10.1002/joom.1021

Taps, S. B., Ditlev, T., & Nielsen, K. (2016). Mass customization in SMEs: Literature review and research directions. *Managing Complexity*, 195-203. https://doi.org/10.1007/978-3-319-29058-4_15

Trentin, A., Somià, T., Sandrin, E., & Forza, C. (2019). Operations managers' individual competencies for mass customization. *International Journal of Operations & Production Management(ahead-of-print)*. https://doi.org/10.1108/ijopm-10-2018-0592

Ullah, I., & Narain, R. (2020). Achieving mass customization capability: The roles of flexible manufacturing competence and workforce management practices. *Journal of Advances in Management Research(ahead-of-print)*. https://doi.org/10.1108/jamr-05-2020-0067

Wamba, S. F., Gunasekaran, A., Akter, S., & Dubey, R. (2020). The performance effects of big data analytics and supply chain ambidexterity: The moderating effect of environmental dynamism. *International Journal of Production Economics*, *222*, 107498. https://doi.org/10.1016/j.ijpe.2019.09.019

Wei, H. L., & Wang, E. T. (2010). The strategic value of supply chain visibility: Increasing the ability to reconfigure. *European Journal of Information Systems*, *19*(2), 238-249. https://doi.org/10.1057/ejis.2010.10

Wei, H.-L. (2010). The strategic value of supply chain visibility: Increasing the ability to reconfigure. *Strategic Direction*, *26*(9), 238-249. https://doi.org/10.1108/sd.2010.05626iad.003

Wu, Y., Sheng, Y., & Cai, N. (2016). Study on mass intelligent customization based on internet plus cases of Qingdao redcollar and foshan weishang furniture. *China Industrial Economics*, *4*, 127-143. doi:10.19581/j.cnki.ciejournal.2016.04.010

Youssef, M. A. E.-A., Eid, R., & Agag, G. (2022). Cross-national differences in big data analytics adoption in the retail industry. *Journal of Retailing and Consumer Services*, *64*, 102827. https://doi.org/10.1016/j.jretconser.2021.102827

Yu, W., Chavez, R., Jacobs, M. A., & Feng, M. (2018). Data-driven supply chain capabilities and performance: A resource-based view. *Transportation Research Part E: Logistics and Transportation Review*, *114*, 371-385. https://doi.org/10.1016/j.tre.2017.04.002