

Supply Chain Performance During Pandemic COVID-19: A Systematic Literature Review

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Abstract: After going through the COVID pandemic, supply chain management is required to advance performance. A literature review is carried out to find the actual current conditions and ideas for possible improvements. Root cause and knowledge, potential problems that will occur, and ideas for improvement are the main focus that needs to be designed to accelerate post-pandemic supply chain performance improvements. This research is using systematic literature review using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis). PRISMA uses four steps: identification, screening, eligibility, and included. The literature review uses an online database using Google Scholar. To access the data from Google Scholar, use Publish or Perish System and VOSviewer system. Based on 100 journals that have information related to supply chain performance during and after the pandemic, it can be concluded that ten categories are most relevant to the topics discussed. Integration between parts of supply chain management is considered very important to improve supply chain performance. This is related to the weakening of several factors due to not being able to work optimally. This condition makes it possible to carry out simulations using certain software to get a picture of the future condition of the company, especially regarding supply chain performance.

1. INTRODUCTION

The COVID-19 pandemic has had an impact on the supply chain systems of countries in the world, particularly related to the regulation of the movement of goods. Since 2020, many company has to decline its business as the impact of the pandemic. The decline in demand also results in a decrease in the value of the economy which will directly impact on the decline in investment, labor growth, and supply chain. Most of the company must re-configuring resource to achieve better performance during the pandemic [1].

In addition, during the COVID-19 pandemic, most people around the world are focused on how to survive with limited resources. This also indirectly affects people's consumption patterns and the level of product demand in the market. This unstable condition has a significant impact on the performance of the supply chain system [2]. In an emergency, profit and responsiveness are nonlinear and positively correlated [3].

Supply chain is defined as the collaboration among primary and secondary stakeholders to achieve goals [4]. Primary stakeholders are actively involved in main process in supply chain while secondary stakeholders assist primary stakeholders in achieving goals. Since there are many stakeholders in supply chain, the supply chain performance are potentially complicated to achieved goals [5]. To improve the supply chain, strategies are applied to

many sectors including stakeholders coordination and collaboration [6].

For instance, the application of the Green Supply Chain system to an automotive company in China has helped the company evaluate its performance. Increasing awareness of the impact of carbon emissions from the combustion process is the main focus in implementing green supply chains in companies. Improvement of the company's system increases the company's performance from time to time so that continuous improvements need to be made to make the company able to survive in the automotive industry. The simulation results illustrate that for the process of implementing supply chain performance improvements through the implementation of a green supply chain system, scenarios of future conditions must be considered. In addition, companies must also consider the impact of the corona virus on the product development process at the company [7].

One of the solutions offered by a company in responding to the need to improve supply chain performance is to implement a digitalization system. When implementing a digitalization system, it helps companies accelerate improvements in the company's supply chain performance. The importance of improvements to the company's operational system, the technology used, the applications used, and decision-making innovations are the keys to which the implementation will be reviewed. The data used in the evaluation process will use actual and

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real data so as to minimize the potential for time bias in the process of improvement and decision making.

In general, there are many factors that will influence the assessment of supply chain performance. Factors such as Technology Enablers, Financial Resources Required, Ease of Operation and Capabilities are indicators that need to be considered [8]. Ref. [9] define some attributes to assess supply chain performance, including responsiveness, asset, agility, and cost. In other research related to covid 19 effect, [10] found that three factor that has significant impact, including demand, supply and logistic. Further, [2] found that logistic performance have significant impact to supply chain during pandemic covid-19.

Based on the current conditions and the need for acceleration to improve supply chain performance, a literature review is carried out to find the actual current conditions and ideas for possible improvements. Knowledge of the causes of problems, potential problems that will occur and ideas for improvement are the main focus that needs to be found to ccelerate post-pandemic supply chain performance improvements.

2. METHOD

This reasearch is using systematic literature review using PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) which is introduced by [11]. PRISMA uses 4 steps, there are identification, screening, eligibility and include. The literature review is use online database using Google Scholar. To access the data from Google Scholar is use Publish or Perish System and VOSviewer system.

This research uses the data from 2021-2022 for 100 journals that has information related on the supply chain performance during pandemic COVID-19. The data will be review and selected only that has information related on the supply chain performance, especially during pandemic COVID-19. Further, the analysis quantitative analysis is also provided using VOSViewer to provide potential research.

3. RESULT AND DISCUSSION

3.1. Article analysis and subject

Based on 100 journals that have information related to supply chain performance during the pandemic and after the pandemic, it can be concluded that 10 categories are most relevant to the topics discussed. The process of filtering the data that best fits this research can be seen in Figure 1. Subject area of this study is shown by Table 1.

The following is a visualization map showing in detail the author keyword term co-occurrence network based on title and abstract fields (Full Counting) is shown by Figure 2.

The vosviewer analysis showed that performance and covid subject has strong relationship. Supply chain analysis also provides a compliment as the subject of

performance during covid-19. The complete analysis will also be provided in the next section.

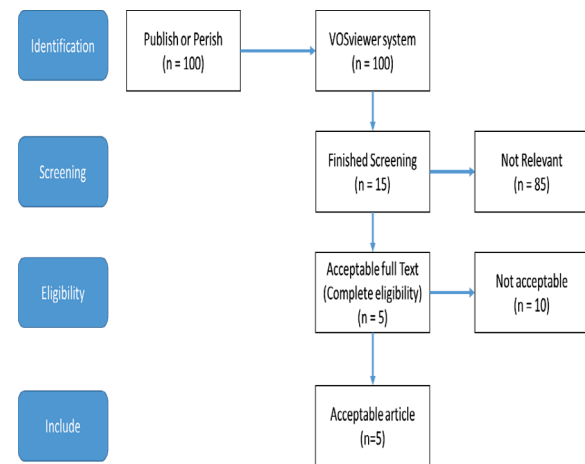


Fig. 1. Flow of Systematic Review using PRISMA Method

Table 1. Subject Area

No	Subject Area	Occurance	Relevance
1	Post Covid	10	2,030
2	Covid	127	1,970
3	Performance	99	1,380
4	Supply Chain Management	38	0,980
5	Operational Performance	11	0,830
6	Supply Chain	71	0,800
7	Pandemic	46	0,630
8	Supply Chain Performance	36	0,600
9	Effect	21	0,410
10	Era	8	0,370

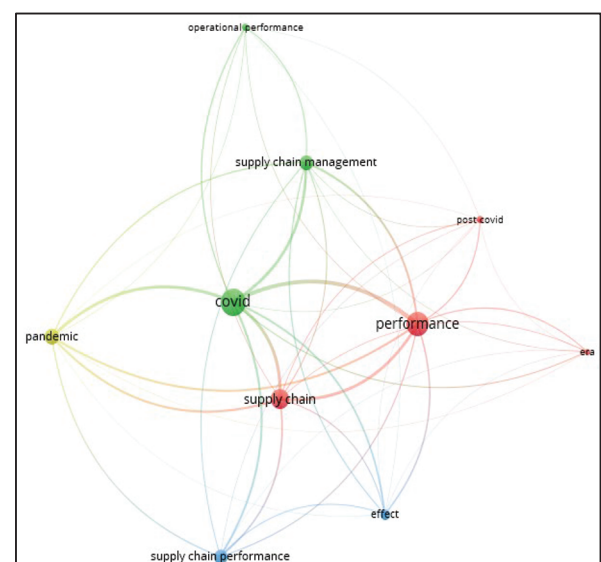


Fig. 2. Criteria that Related on The Reserach

3.2 Potential result for supply chain performance

While the challenges of dealing with conditions during COVID have been overcome by several companies, it is necessary to prepare in the future to deal with post-pandemic conditions. Potential conditions in the future

demand that careful preparation be made and be able to answer the company's needs properly. Preparations being made at this time can be in the form of a simulation of scenarios that might occur in the future through certain studies [6].

Table 2. Literature Review

No.	Researcher	Result
1	Rajeev et al. [12]	This study observed 5 countries with heterogeneous characteristics, namely China, USA, Sierra Leone, Germany and Nepal. The results showed that there was a decrease in supply chain performance. In general, the cause of the decline in supply disruption performance is because policy makers are trying to find effective ways to solve health problems due to the virus. The process of improvement from the health side directly affects the movement of the economy in a country due to difficulties in carrying out certain activities. The results of the research by carrying out the simulation process show that there is an economic increase of 14.4% after the improvement of the performance of the state supply disorder system is carried out. Therefore, in the future, countries need to consider supply chain aspects in making decisions because it will have a significant impact on a country's economy.
2	Siagian et al. [13]	Restrictions on movement during the COVID 19 pandemic caused many companies, especially in the manufacturing sector, to be disrupted. This is due to difficulties in space, changes in government regulations in the logistics sector and changes in the public demand system. Therefore, an irrational improvement effort is needed to help manufacturing companies in Indonesia to recover from the current conditions. This study covers supply chain integration on business performance through supply chain resilience, supply chain flexibility, and innovation systems in Indonesian manufacturing. Data collection was carried out by distributing questionnaires to 470 respondents. The results of the study show that integration between all parts of the supply chain plays a very important role in accelerating efforts to improve supply chain performance.
3	Joshi et al. [14]	Changes in the condition of the supply chain system during the COVID 19 pandemic will directly impact the company's supply chain system from a financial perspective. The worst impact of this condition can result in the closure of the company. Prevention needs to be done to keep the company in a stable condition and able to bounce back after the COVID 19 pandemic. The use of the structural equation modeling (SEM) method as an analytical tool for current conditions is expected to be a tool for monitoring supply chain conditions and evaluating company supply chain performance. The results of the study show that policy coordination, continuous improvement, integration in dealing with all kinds of situations and the ability to bounce back from problems carried out by the practice of Sustainable Supply Chain Management (SSCMP) will have a very significant impact on a company's dynamic capabilities (DC).
4	Rozhkov et al. [15]	During the COVID 19 pandemic there was a change in the company's operational system. In this study, simulations will be carried out on three levels in the supply chain system, namely the integration between the dynamics during COVID 19, the supply chain scheme and the company's operational system, especially in the product storage system in the warehouse. The simulation model is determined based on the analytical model and real algorithm data used by the company in managing the company's supply chain system. The results of the study indicate that it is necessary to improve the management decision-making system, especially regarding inventory withdrawals in the warehouse. The simulation model shows the need to increase the amount of product inventory in the warehouse so that the company is able to meet fluctuating consumer demand. Increasing the number of products in the warehouse is also a solution that can be implemented by the company in the long term.
5	Li et al. [16]	One of the essential findings of this study was that IS and SCC positively mediated the effect of IT on SCP significantly. Based on these findings, the research gap among unifying IT, SCC, IS, and SCP in a single research model is answered. The presence of information technology in business enables companies to share information quickly and in real-time. IT also encourages companies to collaborate between supply chain partners, which eventually increases SCP. These findings provide practitioners with insight into the importance of IT, IS, and SCC in the pursuit of superior SCP.

A systematic review is the study of clearly constructed questions, using systematic and explicit methods to identify, select and critically evaluate relevant studies and collect and analyses data from selected studies [7]. Some of the references used in this study can be seen in Table 2.

3.3 Further potential research

The use of the PRISMA method allows researchers to review several journals that are directly related to the topic being studied, such as performance supply chain management. The PRISMA method can be supported by the use of software such as Publish or Perish, VOSviewer and Mendeley. The three softwares help in filtering journals that are relevant to the research being carried out. In addition, the software is able to show the performance keywords that appear most often in previous journals.

In this study, based on previously existing journals, it can be seen that the difficulty of shipping or distributing products between countries has a significant impact on corporate chaos performance. In addition, the cessation of several activities in certain countries resulted in a buildup of products in the producer area.

Integration between parts of supply chain management is considered very important to improve supply chain performance. This is related to the weakening of several parts due to not being able to work optimally. This condition makes it possible to carry out simulations using certain software to get a picture of the future condition of the company, especially with regard to supply chain performance. Moreover, another potential research in supply chain during pandemic is on how to evaluate the supply chain performance since it found many barriers. As found by [17], it needs to provide a system to counter barriers in supply chain performance.

4. CONCLUSION

The results obtained from this study are as follows:

- a. The results of the identification of current supply chain performance conditions indicate low supply chain performance conditions. This is the impact of the COVID-19 pandemic which has disrupted product distribution in several areas.
- b. The use of simulation software can help decision makers to see estimates of the company's condition in the future.
- c. To keep the company's condition optimal, the company needs to improve from the company's IT side so that the information owned by the company is integrated and facilitates decision making.

REFERENCES

- [1] M. M. Queiroz, S. F. Wamba, R. M. Branski,, *Supply chain resilience during the COVID-19: empirical evidence from an emerging economy*, Benchmarking **29**, 6, pp. 1999–2018. <https://doi.org/10.1108/BIJ-08-2021-0454/FULL/XML> (2022)
- [2] R. K. Goel, J. W. Saunoris, S. S. Goel, *Supply chain performance and economic growth: The impact of COVID-19 disruptions*, Journal of Policy Modeling **43**, 2, pp. 298–316. <https://doi.org/10.1016/J.JPOLMOD.2021.01.003>(2021)
- [3] W. Ran, Y. Hu, H. Fu, *Research on the Supply Chain Performance Evaluation Mechanism Based on Emergencies*, *Discrete Dynamics in Nature and Society* **2021**, <https://doi.org/10.1155/2021/6095221> (2021).
- [4] S. Chopra, P. Meindl, *Supply Chain Management: Strategy, Planning and Operation*, 5th ed. New York (US): Pearson, <https://doi.org/10.5772/633> (2013).
- [5] M. Asrol, M. Marimin, M. Machfud, *Supply chain performance measurement and improvement for sugarcane agro-industry*, International Journal of Supply Chain Management **6**, 3, pp. 8–21 <https://doi.org/10.22068/ijiepr.33.3.14> (2017)
- [6] M. Asrol M, M. Marimin, M. Machfud, M. Yani, *Method and approach mapping of fair and balanced risk and value-added distribution in supply chains: A review and future agenda*, International Journal of Supply Chain Management **7**, 5, pp. 74–95 (2018)
- [7] B. Jin, *Research on performance evaluation of green supply chain of automobile enterprises under the background of carbon peak and carbon neutralization*, Energy Reports **7**, pp. 594–604. <https://doi.org/10.1016/J.EGYR.2021.10.002> (2021)
- [8] T. S. Deepu, V. Ravi, *Supply chain digitalization: An integrated MCDM approach for inter-organizational information systems selection in an electronic supply chain*, International Journal of Information Management Data Insights **1**, 2, 100038, <https://doi.org/10.1016/J.JJIMEI.2021.100038> (2021)
- [9] APICS, *Supply Chain Operations Reference Model SCOR -Intro to V12*, Supply Chain Operations Management **24** (2017)
- [10] M. Grida, R. Mohamed, A. N. H. Zaied, *Evaluate the impact of COVID-19 prevention policies on supply chain aspects under uncertainty*, Transportation Research Interdisciplinary Perspectives **8**, 100240. <https://doi.org/10.1016/J.TRIP.2020.100240> (2020)
- [11] D. Moher, A. Liberati, J. Tetzlaff, D. G. Altman, D. Altman, ... P. Tugwell, *Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement*, PLoS Medicine **6**, 7 <https://doi.org/10.1371/journal.pmed.1000097> (2009)
- [12] A. Rajeev, R. K. Pati, S. S. Padhi, K. Govindan, *Evolution of sustainability in supply chain management: A literature review*, Journal of Cleaner Production **162**, pp. 299–314, <https://doi.org/10.1016/j.jclepro.2017.05.026> (2017)
- [13] H. Siagian, Z. J. H. Tarigan, F. Jie, *Supply Chain Integration Enables Resilience, Flexibility, and Innovation to Improve Business Performance in COVID-19 Era*, Sustainability **2021**, Vol. 13, Page 4669 **13**, 9, 4669. <https://doi.org/10.3390/SU13094669> (2021)
- [14] S. Joshi, M. Sharma, *Impact of sustainable supply chain management on performance of SMEs amidst COVID-19 pandemic: an Indian perspective*, International Journal of Logistics Economics and Globalisation **9**, 3, 248. <https://doi.org/10.1504/IJLEG.2022.120811> (2022)

- [15] M. Rozhkov, D. Ivanov, J. Blackhurst, A. Nair, *Adapting supply chain operations in anticipation of and during the COVID-19 pandemic*, Omega **110**, 102635.
<https://doi.org/10.1016/J.OMEGA.2022.102635> (2022)
- [16] N. Li, *The effects of information technology implementation on supply chain collaboration*, International Journal of Internet and Enterprise Management **4**, 2, pp. 118,
<https://doi.org/10.1504/IJIEEM.2006.010238> (2006)
- [17] N. Fares, J. Lloret, *Barriers to supply chain performance measurement during disruptions such as the COVID-19 pandemic*, International Journal of Quality and Reliability Management **40**, 5, pp. 1316–1342,
<https://doi.org/10.1108/IJQRM-03-2022-0095/FULL/XML> (2023)