



A proposed conceptual framework of supply chain operations reference (SCOR) model in Indonesian industries: a literature review



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Abstract

This article uses the approach of a literature review study sourced from previous research and relevant to this research, namely the Supply Chain Operations Reference model. The phenomenon is that previous studies have not reviewed the Supply Chain Operations Reference (SCOR) model as an interesting thing to study in collaboration with other methods in a structured way. This study aims to give a proposed framework of the SCOR model as a reference for detailed information related to the SCOR model in Indonesia's retail, manufacturing, and service industries. The results of the paper are the year of publication for the 50 articles reviewed consists of 2018-2021 for the country of Indonesia. The research object consists of 3 objects, namely the retail, manufacturing, and service industries. Most supply chain performance levels in Indonesia are in a good category. Most of the research variables majority of the five variables often used in the SCOR model: plan, source, make, deliver, and return. The performance attribute priority that needs to be improved is the reliability attribute. The method used by previous research is 17 methods. This method can be used as an illustration to see how the SCOR model can collaborate with other methods. The paper's conclusion is the research proposed framework regarding the application of the SCOR model that can be collaborated with other methods.

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Keywords:

*Framework;
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INTRODUCTION

Currently, corporates must have the ability to compete in similar industries so that they can grab market share and obtain profits. Competition is viewed from how corporates implement processes in producing products or services that are better, faster, and cheaper than their competitors. The way to increase the corporate's competitiveness is through integrating the corporate's supply chain activities [1].

A supply chain is a network of corporates that work together to create and deliver a product to the end user. The corporate usually consists of suppliers, manufacturers,

distributors, and supporting corporates such as logistics service corporates [2].

Corporations must think creatively in implementing competitive strategies by producing higher quality and cheaper goods or services. Supply chain performance measurement must be implemented to increase competitiveness supply chain performance measurement is a corporate performance measurement system that can help monitor the applications of Supply Chain Management (SCM) so that they run well [3].

The government makes regulations, namely Law No. 3 the year in 2014, about the industry's obligation to make plans for using natural resources, starting from product design,

production processes, waste treatment, and optimization of product waste. Therefore, sustainable Supply Chain Management (SSCM) must be applied based on existing regulations and demand levels. SSCM integrates sustainable environmental, financial and social aspects in the supply chain [4].

The Supply Chain Operations Reference (SCOR) method measures the performance of a corporate's supply chain. SCOR splits the supply chain process becomes five processes, namely the planning process (plan), procurement process (source), production process (make), delivery process (delivery), and return process (return) [3]. The SCOR model consists of five performance attributes: reliability, responsiveness, agility, cost, and asset management [5].

This article uses the approach of a literature review study sourced from previous research and relevant to this research, namely the Supply Chain Operations Reference model. This article can be used as a reference to find further research gaps. The Systematic Literature Review in this article was conducted to identify the development of the SCOR (Supply Chain Operations Reference) model in the retail, manufacturing, and service industries in Indonesia.

The phenomenon is that previous studies have not reviewed the SCOR model as an interesting thing to study in collaboration with other methods in a structured way. This research is interesting and important because it proposed a framework for the SCOR model that collaborated with various methods. The proposed framework of the SCOR model is a reference framework as a management strategy to guide researchers and practitioners in ranging from methods of measuring company supply chain performance to determining improvement strategies. So, This study aims to give a proposed framework of the SCOR model as a reference for detailed information related to the SCOR model in Indonesia's retail, manufacturing, and service industries.

METHOD

This article uses a literature review study approach to identify the development of the Supply Chain Operations Reference (SCOR) model in the retail, manufacturing, and service industries in Indonesia. Materials and methods contain the number of articles to be reviewed, sources of literature review, the steps of Systematic Literature Review (SLR) used in this literature review, and the process of making the

SCOR model. The following are the material and methods of this research.

The paper search was based on Google Scholar searches and found 50 articles relevant to implementing the SCOR model in the Indonesian industry. Finally, 50 articles were selected. The 50 articles conducted a literature review study from previous research on the SCOR model to find gaps in future research. The steps of the research methodology to create a conceptual framework for the proposed SCOR model can be seen in Figure 1.

The steps of Systematic Literature Review (SLR) were used in this literature review. The process flow of SLR is shown in Figure 1. The complete methodology of this study follows six steps that include collecting relevant SCOR models and reading relevant articles (The SCOR model-based). Classifying articles becomes the chart, map of the future research framework, and systematic review of the SCOR model. The process of making the SCOR model can be seen in Figure 2.

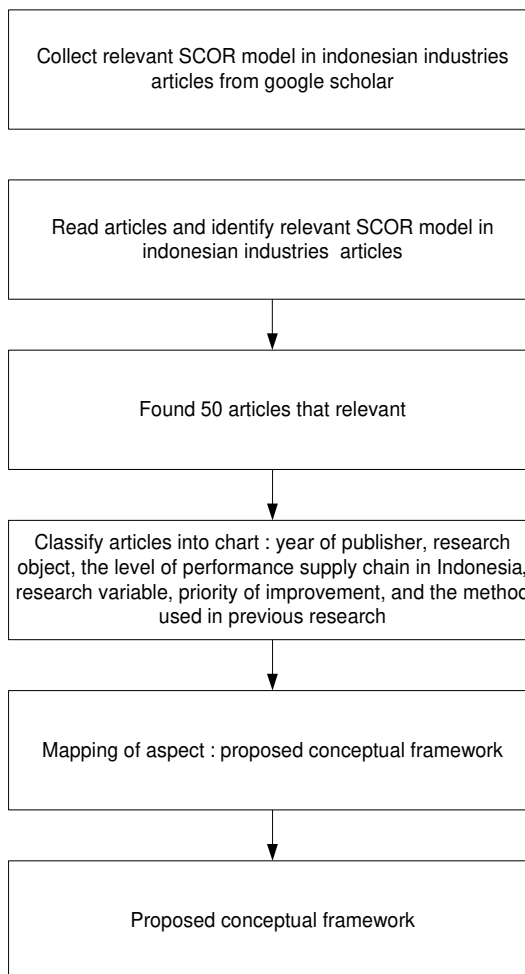


Figure 1. Step by Step of Research Methodology

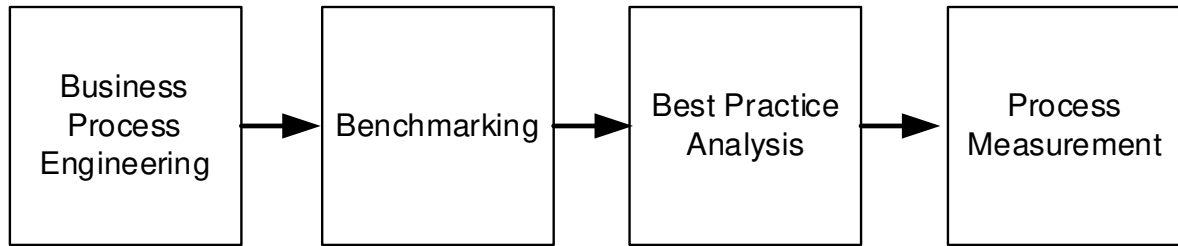


Figure 2. Process of Making SCOR Model

Making SCOR models integrate the well-known concepts of business process reengineering, benchmarking, and process measurement into a cross-functional framework. Business process engineering essentially captures complex processes happening now and is defined as the desired process. Benchmarking activities to get operational performance data from similar companies and internal targets are then determined based on the best-in-class performance. Best practice analysis chooses the best way to get the expected performance. Then added, one element is the goal of the three elements. Process measurement serves to measure, control and improve supply processes chain.

RESULTS AND DISCUSSION

The Systematic Literature Review in this article was conducted to identify the development of the SCOR (Supply Chain Operations Reference) model in Indonesia's retail, manufacturing, and service industries. In this Table 1, each manuscript has been analyzed using different factors like paper identity, research object, and result.

Now, The SCOR (Supply Chain Operations Reference) model is widely used across corporates in retail, manufacturing, and services industries in Indonesia. The SCOR model systematically analyzes their supply chain performance, improves communication among members in the supply chain, and designs better supply chain networks. The mapping Project of SCOR can be seen in Table 1.

Table 1. Mapping Project of SCOR

No	Paper Identity	Research Object	Result
1.	Kusrini et al. [6]	in a Retail in Indonesia	Halal indicators consist of 22 valid performance metrics. Supply chain performance is included in the excellent category (91.4). The corporate still has to make improvements, especially in terms of flexibility and reliability.
2.	Hasibuan et al. [3]	PT. Shamrock Manufacturing Corpora	The indicator consists of 12 valid performance metrics. Supply chain performance of PT. Shamrock Manufacturing Corpora is included in the good category (50-100). Attribute responsiveness (0.649) is a priority for improvement because it has the highest weight.
3.	E. Kusrini et al. [7]	A Leather SME	The indicator consists of 48 valid performance metrics. The supply chain performance of this corporate is in the average category (54.29). The agility attribute is a priority for improvement because it has the performance lowest value attribute (9,09).
4.	Waaly et al., [8]	A Leather Tanning Industry	The indicator consists of 8 valid performance metrics. This corporate's supply chain performance is marginal (44.37). The responsiveness attribute is a priority improvement because it has the highest weight value (0.257).
5.	Saputra et al., [9]	at Table Tennis Table Manufacturer	The indicator consists of 21 valid performance metrics. The corporate's supply chain performance is in a good category (72.09). The cost attribute is a priority for improvement because it has the lowest attribute performance value (6.93).
6.	Pulansari & Putri, [10]	Steel Corporate	The indicator consists of 16 valid performance metrics. The corporate's supply chain performance is average (67.73). The reliability attribute becomes a priority for improvement because of the value of its own lowest normalization (38).
7.	Rakhman et al., [11]	Automotive corporate	The indicator consists of 9 valid performance metrics. The supply chain performance of this corporate is in a good category (76). The cost attribute is a priority for improvement because it has the highest weight value (71).
8.	Wulandari et al., [12]	Producer of Catfish Frozen Food	The indicator consists of 19 valid performance metrics. The corporate's supply chain performance is in the excellent category (91.24). The asset management attribute is a priority for improvement because it has the lowest attribute performance value (0.033).
9.	Djatna et al., [13]	Palm Oil Industry	The indicator consists of 18 valid performance metrics. This corporate's supply chain performance is categorized as poor (64). The agility attribute becomes improvement priority because it has the lowest weight value lowest (4).
10.	Kusrini et al.,	In	The indicator consists of 28 valid performance metrics. The corporate's supply chain

No	Paper Identity	Research Object	Result
	[14]	Supermarket	performance is in a good category (80.64). The responsiveness attribute is a priority improvement because it has a normalized value lowest (50).
11.	Ranggadara & Sfenrianto, [15]	A Fashion Trade Business	The indicator consists of 10 valid performance metrics. The corporate's supply chain performance is in the average category (62.61). The asset management attribute is a priority for improvement because it has the lowest attribute performance value (0.067).
12.	Effendi et al., [16]	Sugar industries	The indicator consists of 17 valid performance metrics. The corporate's supply chain performance is in the average category (56.12) the waste management attribute is a priority for improvement.
13.	Novar et al., [17]	Indonesian Bureau of Logistics	The indicator consists of 17 metrics valid performance. The corporate's supply chain performance is in the average category Industry marginal category (67.56). The reliability attribute becomes a priority for improvement because it has the highest weight value (0.593).
14.	Sutoni et al., [18]	PT. BRS	The indicator consists of 32 valid performance metrics. The supply chain performance of this corporate is in the good category (80.48). The reliability attribute becomes a priority for improvement because it has the lowest attribute performance value (5.42).
15.	Kusrini et al., [19]	SME Producing Sports Clothes	The indicator consists of 27 valid performance metrics. The corporate's supply chain performance is in a good category (77.89). the cost attribute is a priority for improvement because it has the lowest attribute performance value (40).
16.	Fauziah et al., [20]	Food and beverage corporates	The indicator consists of 15 metrics of valid performance. The corporate's supply chain performance is in a good category (72.73). The responsiveness attribute is a priority improvement because it has the lowest attribute performance value (70.78).
17.	Immawan & Nugraha, [21]	Oil and gas upstream industry	The indicator consists of 17 metrics valid performance. The corporate's supply chain performance is in a good category. The reliability attribute is a priority for improvement.
18.	Anham et al., [22]	The Maintenance Repair and Overhaul (MRO) Industry	The indicator consists of 35 valid performance metrics. The corporate's supply chain performance is in a good category (89.23). The agility attribute becomes a priority for improvement because it has the highest weight value (0.363).
19.	Yuniaristanto et al., [23]	The Lithium Battery Factory	The indicator consists of 26 valid performance metrics. The corporate's supply chain performance is average (65.13). The responsiveness (50) and agility (50) attributes to become a priority for improvement because it has the lowest attribute performance value.
20.	Sudrajat et al., [24]	Manufacturers of coated and painted steel	The indicator consists of 28 valid performance metrics. The corporate's supply chain performance is in a good category (88.14). The responsiveness attribute becomes a priority for improvement because it has the lowest attribute performance value (57).
21.	Makkarenn et al., [25]	Palm Sugar Industry	The indicator consists of 19 valid performance metrics. The corporate's supply chain performance is in the marginal category (46). the flexibility attribute becomes a priority for improvement because it has the highest weight value (0.194).
22.	Hasibuan & Dzikrillah, [2]	Indonesia Chemical Industry	The indicator consists of 28 valid performance metrics. The supply chain performance of this corporate is in the good category (60-80). responsiveness attribute becomes a priority for improvement because it has the lowest attribute performance value (37).
23.	Defrizal et al., [26]	Rice Milling Unit	The indicator consists of 9 valid performance metrics. The corporate's supply chain performance is in the average category (64). The reliability attribute becomes a priority for improvement because it has the highest weight value (0.99).
24.	Alfaliansyah & Maswadi, [27]	The Coconut Industry	The indicator consists of 6 valid performance metrics. The corporate's supply chain performance is in the average category (64). The reliability attribute becomes a priority for improvement.
25.	Handayani & Setyatama, [28]	Green Avenue Apartments of East Bekasi	The indicator consists of 17 valid performance metrics. The corporate's supply chain performance is in a good category (75.44). The reliability attribute becomes a priority for improvement.
26.	Maulidah et al., [29]	Potato Agro-Industry	The indicator consists of 18 valid performance metrics. The corporate's supply chain performance is average (55.7). Asset management attributes are a priority for improvement.
27.	Desparita et al., [30]	Large Scale Rice Refineries	The indicator consists of 19 metrics valid performance. The corporate's supply chain performance is average (53.95). The cost attribute is a priority improvement because it has the lowest attribute performance value (4.10).
28.	Wahyuni et al., [31]	Tempeh crackers	The indicator consists of 15 metrics valid performance. The corporate's supply chain performance is in the marginal category (45.94). The reliability attribute is a priority

No	Paper Identity	Research Object	Result
29.	Suseno & Sulistyowati, [32]	Produces batteries	improvement because it has the lowest normalized value (0). The indicator consists of 9 metrics valid performance. The corporate's supply chain performance is average (69.18). The asset management attribute is a priority improvement because it has the lowest attribute performance value (2.18).
30.	Anthara & Damayanti, [33]	The shoe industry	The indicator consists of 13 valid performance metrics. The supply chain performance of this corporate is in a good category (75). The asset management attribute is a priority for improvement because it has the lowest attribute performance value.
31.	Susanto et al., [34]	A Batik Corporate	The indicator consists of 25 metrics of valid performance. The corporate's supply chain performance is average (69.98). The reliability attribute is a priority improvement because it has the lowest attribute performance value.
32.	Miharja et al., [35]	Borondong Industry SMEs	The indicator consists of 12 metrics valid performance. The corporate's supply chain performance is in the average category. The asset management attribute is a priority improvement because it has the lowest attribute performance value.
33.	Raga et al., [36]	Pharmaceutica l Corporate	The indicator consists of 51 metrics valid performance. The corporate's supply chain performance is in the excellent category (96.51). The cost attribute is a priority improvement because it has the lowest attribute performance value (25).
34.	Dianawati & Zamzamy, [37]	Automotive corporates	The indicator consists of 29 metrics valid performance. The corporate's supply chain performance is in the average category (82.14). The reliability attribute is a priority improvement.
35.	Kodrat et al., [38]	Passion fruit agro-industry	The indicator consists of 9 metrics valid performance. The corporate's supply chain performance is in the average category (78.69). The reliability attribute is a priority improvement because it has the highest weight value (0.38).
36.	Prasetyaning sih et al., [39]	A Plastic Corporate	The indicator consists of 28 metrics valid performance. The corporate's supply chain performance is in the average category (68.23). The reliability attribute is a priority improvement because it has the lowest attribute performance value (0).
37.	Afianto et al., [40]	The Soybean Agroindustry	The indicator consists of 7 metrics valid performance. The corporate's supply chain performance is in a good category (85.67). The cost attribute is a priority improvement because it has the highest weight value (0.286).
38.	Putridewi et al., [41]	the Cement Industry	The indicator consists of 18 metrics valid performance. The corporate's supply chain performance is in a good category (77). The reliability attribute is a priority improvement because it has the lowest attribute performance value (-1.93).
39.	Ramadheena et al., [42]	At SME Tosuka Coffee	The indicator consists of 24 valid performance metrics. The corporate's supply chain performance is in a good category (86.24). Asset management attributes are a priority for improvement because they have attribute performance values lowest (4).
40.	Henry & Nusraningrum, [43]		The indicator consists of 13 metrics valid performance. The corporate's supply chain performance is average (67.95). The reliability attribute is a priority improvement because it has the lowest attribute performance value (8.92).
41.	Suryaningrat et al., [44]	Ribbed Smoke Sheet Industry	The indicator consists of 24 metrics valid performance. The corporate's supply chain performance is in a good category (72.03). The reliability and flexibility attribute is a priority improvement because it has the lowest attribute performance value (9.67).
42.	Wibowo et al., [45]	Building construction project	The indicator consists of 4 metrics valid performance. The corporate's supply chain performance is in the marginal category (49). The reliability and responsiveness attribute is a priority improvement because it has the lowest attribute performance value.
43.	Kuswandi et al., [46]	Leather Tanning Industry	The indicator consists of 13 metrics valid performance. The corporate's supply chain performance is in a good category (80.09). The cost attribute is a priority improvement because it has the lowest attribute performance value (11).
44.	Taptajani et al., [47]	Business Red Press	The indicator consists of 12 metrics valid performance. The corporate's supply chain performance is in a good category (74). The asset management attribute is a priority improvement because it has the lowest attribute performance value (60).
45.	Nuraina et al., [48]	a dairy farmer cooperative	The indicator consists of 9 metrics valid performance. The corporate's supply chain performance is in the excellent category (98.94). The responsiveness attribute is a priority improvement because it has the lowest attribute performance value (11.73).
46.	Permata et al., [49]	Oil Palm Biomass	The indicator consists of 13 metrics valid performance. The corporate's supply chain performance is in the average category (67.83). The reliability attribute is a priority improvement because it has the lowest attribute performance value (41.4).
47.	Adriant et al., [50]	Defense Corporate	The indicator consists of 19 metrics valid performance. The corporate's supply chain performance is in a good category (86.54). The reliability attribute is a priority improvement.
48.	Husna et al., [51]	the Skipjack Tuna fishing industry	The indicator consists of 18 valid performance metrics. The corporate's supply chain performance is average (64.2). The cost attribute is a priority for improvement.
49.	Kusrini et al., [52]	Sugar Corporate	The indicator consists of 45 metrics valid performance. The corporate's supply chain performance is in a good category (70.94). The asset management attribute is a

No	Paper Identity	Research Object	Result
50.	Asrol et al., [53]	Sugarcane Agroindustry	priority improvement. The indicator consists of 14 metrics valid performance. The corporate's supply chain performance is in a good category (79.01). The asset management attribute is a priority improvement because it has the highest weight value (1.26).

The year of publication for the 50 articles reviewed consists of 2018-2021 for Indonesia. The research consists of 3 objects: the retail, manufacturing, and service industries. Most supply chain performance levels in Indonesia are in a good category. The research variables consist of 28, with most of the five variables often used in the SCOR model: plan, source, make, deliver, and return. The performance attribute priority that needs to be improved is the reliability attribute. The method used by previous research is 17 methods consisting of Supply Chain Operations Reference (SCOR), AHP (Analytical Hierarchy Process), KPI (Key Performance Indicator), TLS (Traffic Light System), GSCM (Green Supply Chain Management), Fuzzy AHP, Lean Supply Chain, DMAIC, OMAX, SSCM (Sustainable Supply Chain Management), System Dynamics Modeling, Dematel, ANP (Analytical Network Process, IPA (Importance Performance Analysis), Fuzzy HOR, and OWA (Ordered Weighted Average). This method can be used as an illustration to see how the SCOR model can collaborate with other methods.

The application of the SCOR model based on literature review studies in previous studies showed varying results. All industries can find out the description of supply chain performance categories in Indonesia and know the performance attributes that are the priority for improvement as a step to carry out strategies. Improvement strategies can be used to improve supply chain management performance in the corporate.

Figure 3, Figure 4, Figure 5, Figure 6, Figure 7 and Figure 8 are the results of a review of 50 articles in a graphic form that consist year of the publisher, research object, the level of performance supply chain in Indonesia, research variable, a priority of improvement, and the method used in previous research. After reviewing 50 research articles, the results were obtained in the form of a SCOR model that can be collaborated with other methods in a structured way, starting from measuring the company's supply chain performance to determining improvement strategies. In addition, this study found a gap that can be used for further research, as seen in Figure 9. The research gap is a proposed conceptual framework of the SCOR model that can be

collaborated with other methods such as with Sustainable Supply Chain Management methods, Key Performance Indicators, Analytical Hierarchy Process, Traffic Light System, and Lean Supply Chain.

All methods for measuring company supply chain performance determine improvement strategies. The SCOR model can collaborate with SSCM (Sustainable Supply Chain Management). SSCM is the integration of sustainable financial, environmental and social aspects of an organization's achievements through its business processes to improve its economic performance and supply chain [54][55].

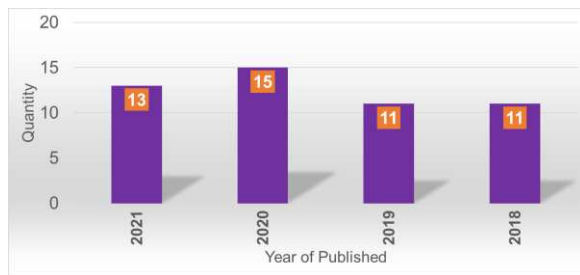


Figure 3. Year of Publisher

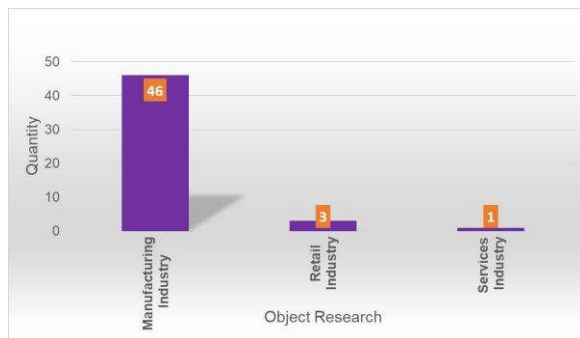


Figure 4. Research Object

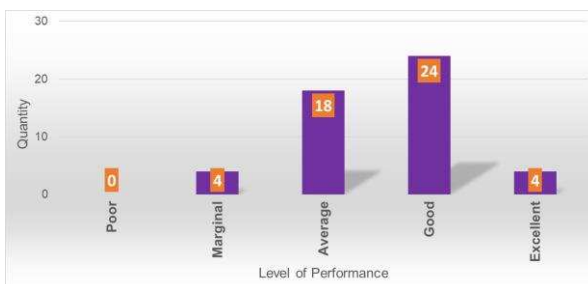


Figure 5. The Level of Performance Supply Chain in Indonesia

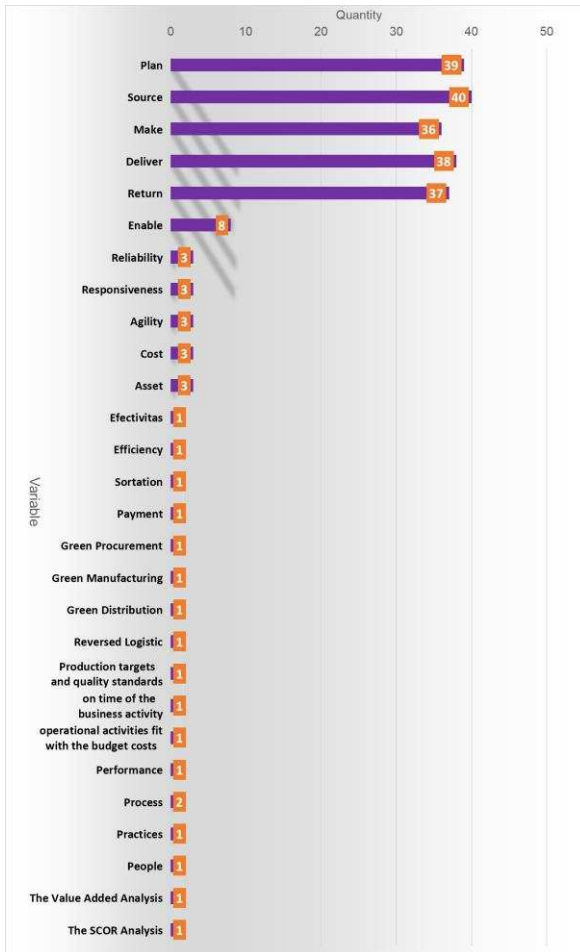


Figure 6. Research Variable

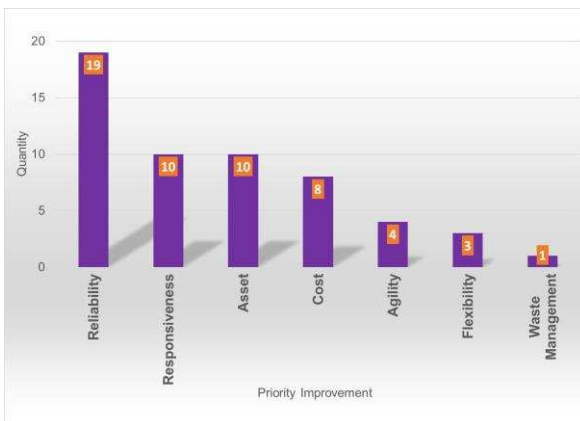


Figure 7. Priority of Improvement

Regulations and changes require the industry to implement aspects of SSCM (Sustainable Supply Chain Management). The application of SSCM requires determining the goals that the corporate wants to achieve for a sustainable supply chain.

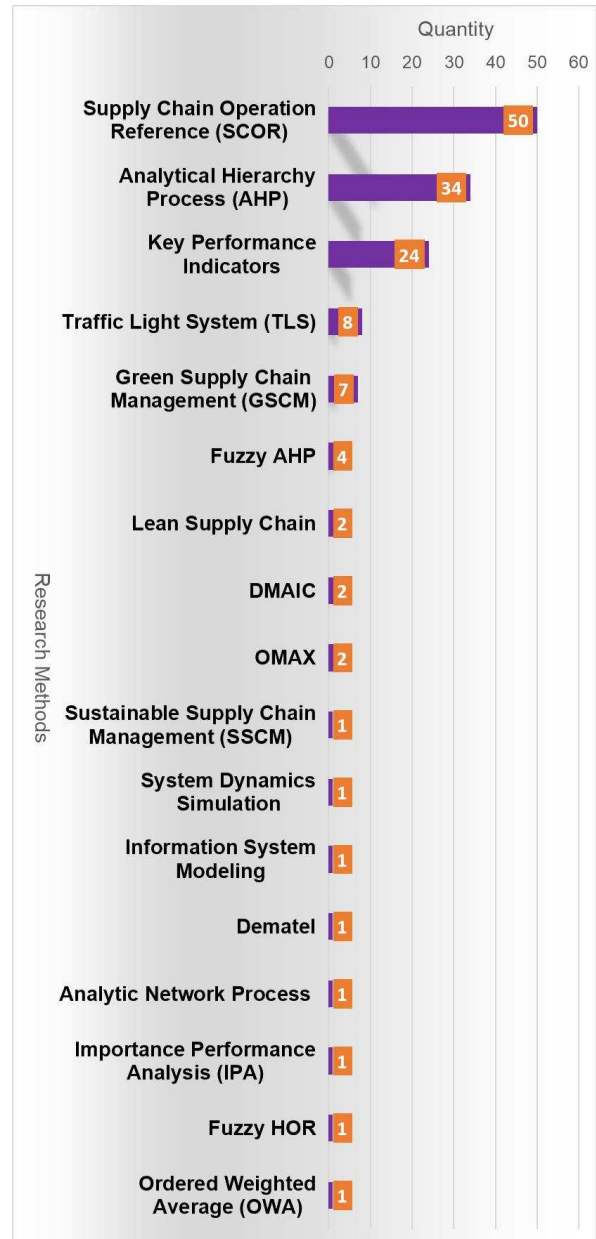


Figure 8. The Method Used in Previous Research

Stakeholders are tasked with determining the corporate's goals based on the corporate's needs. The SCOR model contains a mapping of three hierarchical levels (considering sustainability aspects), namely level 1 in the form of business processes, level two in the form of attributes, and level 3 in the form of metrics.

The SCOR model produces a sustainable Key Performance Indicator (KPI) to monitor and measure the corporate's performance in sustainable applications. Sustainable KPIs are determined to measure the corporate's achievements in implementing sustainable supply chains.

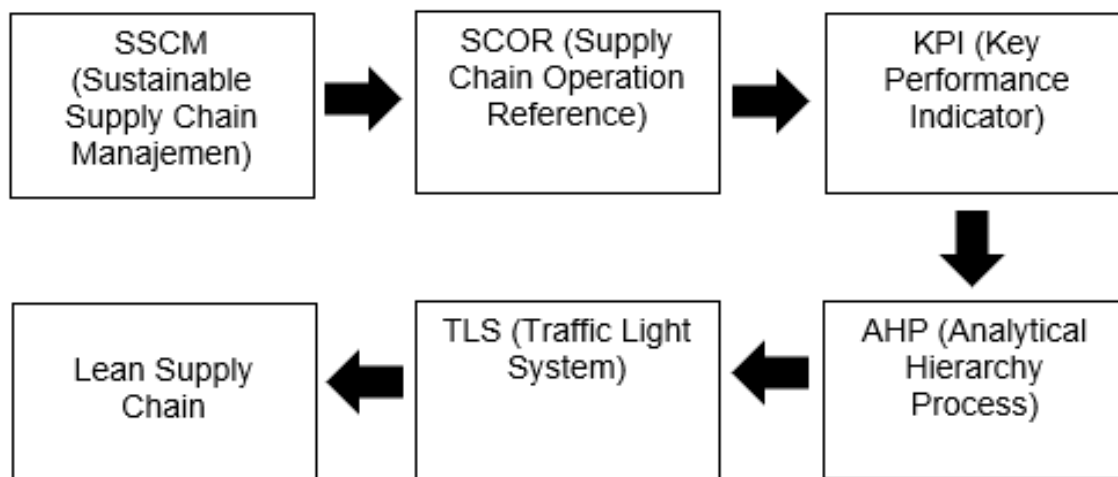


Figure 9. A Proposed Conceptual Framework

Ongoing KPIs are verified to determine Valid and invalid KPIs. A valid sustainable KPI is the KPI that will be used because it is relevant to the corporate's conditions. KPIs that can be applied in the industry are then weighted using the AHP (Analytical Hierarchy Process).

The weighting of KPIs is calculated using Snorm De Boer performance by normalizing each KPI. After knowing the corporate supply chain's performance, the Traffic Light System (TLS) is used to identify KPIs that need improvement. The Traffic Light System is green for results above 80 (>80), yellow for results between 60-79, and red for results below 60 (<60). Colored lights, the red flag, can be used as a benchmark for KPIs that need to be improved [24].

The proposed improvement strategy recommendations are based on Lean Supply Chain principles. Lean has been known as one of the most reliable business strategies in the industry because it provides significant advantages in the supply chain. Implementing Lean SCM in the industry impacts the system that can improve the company's performance to increase its competitiveness [22].

CONCLUSION

The Systematic Literature Review in this article was conducted to identify the development of the Supply Chain Operations Reference (SCOR) model in the retail, manufacturing, and service industries in Indonesia. The paper's conclusion is the research proposed framework regarding the application of the SCOR model that can be collaborated with other methods. The proposed framework is The SCOR model can collaborate with Sustainable Supply Chain Management (SSCM) methods, Key Performance Indicators (KPI), Analytical

Hierarchy Process (AHP), Traffic Light System (TLS), and Lean Supply Chain.

The application of the SCOR model based on a literature review study showed varying results. All industries can find out how big the corporate's supply chain performance is until they know the performance attributes that are priority improvements to improve supply chain performance in industries in Indonesia. So that the industrial implications of this research are the proposed framework of the SCOR model can be a reference frame as a management strategy to guide researchers and practitioners to use methods of measuring company supply chain performance to determine improvement strategies.

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