MEASUREMENT OF ALMAMATER SUIT SUPPLY CHAIN PERFORMANCE IN SACIKA COOPERATIVE USING SCOR

Zahra Fikri Ayu Nirwana[1*], Aruga Yudish Firmansyah[1], Syifa Nur Fadhilah[1], M. Yoka Fathoni[1]

[1]Information System, Institut Teknologi Telkom Purwokerto

email: *20103147@ittelkom-pwt.ac.id

Abstract: SACIKA Cooperative, as a student cooperative at the Telkom Institute of Technology Purwokerto, provides almamater suit procurement services. Currently, the process of procuring and ordering almamater suits is faced with several obstacles, which results in students as customers feeling disadvantaged during the ordering process. Therefore, it is necessary to evaluate the performance of the supply chain at the SACIKA Cooperative in order to improve efficiency and suitability in the procurement of alma mater suits. This study aims to assess the performance of the alma mater suit supply chain at the SACIKA Cooperative using the SCOR Matrix. This type of research is descriptive quantitative, with data collection conducted through interviews and observations. Supply chain performance measurement is carried out using four attributes and matrices, namely Reliability with Perfect Order Fulfillment (POF), Responsiveness with Order Fulfillment Cycle Time (OFCT) Matrix, Agility with Cost of Goods Sold (COGS), and Assets with Cash-to-Cash Cycle Time (CTCCT) Matrix. The results showed the performance value of each matrix, namely POF of 96.47%, OFCT 1 day, COGS 92.94%, and CTCCT 8 days.

Keywords: SCOR matrix; supply chain management; supply chain flow patterns

Abstrak: Koperasi SACIKA, sebagai koperasi mahasiswa di lingkungan Institut Teknologi Telkom Purwokerto, menyediakan layanan pengadaan jas almamater. Saat ini, proses pengadaan dan pemesanan jas almamater dihadapi beberapa kendala, yang mengakibatkan mahasiswa sebagai pelanggan merasa dirugikan selama proses pemesanan. Oleh karena itu, perlu dilakukan evaluasi terhadap kinerja rantai pasok di Koperasi SACIKA guna meningkatkan efisiensi dan kesesuaian dalam pengadaan jas almamater. Penelitian ini bertujuan untuk menilai kinerja rantai pasok jas almamater di Koperasi SACIKA menggunakan Matriks SCOR. Jenis penelitian ini bersifat deskriptif kuantitatif, dengan pengumpulan data dilakukan melalui wawancara dan observasi. Pengukuran kinerja rantai pasok dilakukan dengan menggunakan empat atribut dan matriks, yaitu Reliability with Perfect Order Fulfillment (POF), Responsiveness with Order Fulfillment Cycle Time (OFCT) Matrix, Agility with Cost of Goods Sold (COGS), dan Assets with Cash-to-Cash Cycle Time (CTCCT) Matrix. Hasil penelitian menunjukkan nilai performansi masing-masing matriks, yaitu POF sebesar 96,47%, OFCT 1 hari, COGS 92,94%, dan CTCCT 8 hari.

Kata kunci: matriks SCOR; manajemen rantai pasok; pola aliran rantai pasok

INTRODUCTION

Satria cipta karya cooperative or known as Sacika cooperative is a student cooperative located at Telkom Institute of Technology Purwokerto, Banyumas, Central Java. Cooperative comes from the Latin terms "cooperativus", "cooperative"

(in English), or "cooperatief" (in Dutch). In the Indonesian context, these terms refer to collaboration, cooperation, or joint work [1]. Like a student coopera tive, Sacika cooperative provides various kinds of needs of Telkom Institute of Technology Purwokerto students. This cooperative sells a variety of needs, such as stationery, merchandise and others.

Resources involved must be accurate and skilled in distributing goods to end consumers. [2]. Supply Chain Management is the integration of interre lated business processes between internal and external aspects of the company, starting from suppliers to consumers [3]. Without a supply chain network, comp any operations cannot run normally [4]. Therefore, it is necessary to measure the performance of Supply chain cooperative sacika Telkom Institute of Technology Purwokerto using the SCOR (Supply Chain Operation Reference) method.

The SCOR method is one of many approaches to measuring supply chain performance. Implementing Supply Chain Management helps reduce inven tory costs, including storage, ordering, and shortage costs. [5]. For example, SCOR can organize and supervise shipping and procurement calculations by considering capital and profit aspects [6]. The SCOR model is superior to other models because it is able to identify problems from the internal and external activities of a business [7]. This method has six processes, namely plan, source, make, deliver, return, and enable [8]. There are 5 attributes which are reliabi lity, responsiveness, agility, cost, and asset management [9]. 6 The process is level 1 of the SCOR method itself[10]. Despite its simplicity, SCOR has proven to be an effective tool for supply chain description, analysis, and improvement [11]. Therefore, researchers conducted

research on measuring the performance of the Supply chain using this method has been done [9], [10] ,[12].

Research [13] It highlights the significance of maintaining and measuri ng performance to thrive in dynamic and competitive business environments. The study identified fifteen metrics across three performance attributes: five for reliability, nine for responsiveness, and one for cost. The overall performance score is 72.73, aiding in maintaining and enhancing business performance.

The investigation [14] the focus is on minimizing adjustments while meeti ng customer demands and service requi rements. Research shows an outstanding Perfect Order Fulfillment (POF) rate of 98.72%, indicating high efficiency. Additionally, Order Fulfillment Cycle Time (OFCT) has decreased to 8 days. Cost of Goods Sold is at 75%, represe nting a substantial portion of operational expenses.

The objective of this study [15] to comprehensively assess the supply chain management performance of port opera tors in Indonesia by utilizing the SCOR Model. The focus is on understanding and appropriately evaluating the proces ses involved in logistics business within the main ports of the country.

The research titled "Assessing Hal al Supply Chain Performance through Analytical Hierarchy Process (AHP) and Supply Chain Operations Reference (SCOR) 12.0 Approach: A Case Study" [16] explores the performance evaluation of the supply chain. The findings reveal that the supply chain performance of XYZ Supermarket from January to Ma rch 2021 reached an impressive 97.91%, indicating excellent performance.

Research Title: Evaluation of Perf ormance Utilizing the SCOR and AHP Methodologies Research Outcome: The

Conclusive Supply Chain Performance Score for PT. X is 80.54. This score is considered favorable, falling within the "good" category as final results ranging from 80 to 89 signify satisfactory perfor mance[17].

The enhancement in supply chain performance of a printing services comp any, as per the SCOR model, indicates that while the Make and Source metrics achieved high scores of 99.0 and 95.0 respectively, the delivery process scored the lowest at 80.0 in the performance measurement[18].

The implementation of a SCOR model-based meat supply chain performa nce measurement information system provides quick interpretation and under standing of supply chain performance across multiple dimensions such as reli ability, responsiveness, resilience, cost, and assets. Each metric is customized to meet the specific needs of individual stakeholders in the supply chain.[19].

Research on Performance Improv ement Strategies for Automotive Compan ies with the SCOR Model and Critical Performance Analysis shows that the average supply chain performance in 2019[20] was 82.14%, a "good" category, indicating a satisfactory level of performa nce.

Measuring and improving Supply Chain Network Performance through DEA and SCOR Models [21] showed that in some cases, DEA method yielded lower performance than SFA method. Average performance for DEA was 0.80, slightly lower than SFA's 0.82. Identi fication of indicator deficiencies and stage-wise improvements led to prog ressive efficiency enhancement. Overall average performance during dynamic peri od reached 0.90.

The purpose of this study is to assess the quality of the SuppIy chain process in the sacika cooperative, especially in the process of procuring alma mater suits, after knowing the supply chain process from the results of observations and interviews, a perform ance measurement of the cooperative supply chain will be carried out.

METHOD

The supply chain is a series of ongoing business processes, a series of processes that distribute production obje cts and services to customers. The series runs by taking into account the factors of timeliness, cost and quantity of goods. The consideration of choosing the ITTP sacika cooperative in the case study is that the ITTP sacika cooperative has a flow where a supply chain runs.

Methods the data collection method used in the research is descriptive quantitative. The purpose of using quantitative descriptive methods is the depiction or description of the facts owned by the field. Furthermore, data containing facts in the field were analyzed using the SuppIy Chain Operation Reference method or SCOR for short.

Image 1. Five main processes in the SCOR method

Image 1 displays the 5 processes of the SCOR method. The planning pro cess starts with identifying raw material requirements, planning production, and optimizing inventory. The second process is supplier source selection, followed by

the third process, Make, to process materials into products with strict quality management. Product delivery to campus cooperatives and inventory management in distribution warehouses are done in the fourth process, Deliver. The last process, Return, handles product defects or non-conformities by evaluating the causes of returns and improving the process.

Furthermore, the creation of a research flow chart is carried out, which aims to help facilitate the process of preparing the report by looking at the flow chart created. The following is a picture of the research flow diagram :
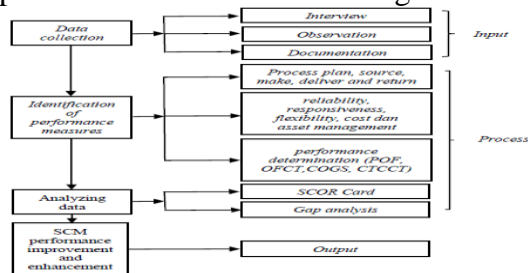

Image 2. Research Flow Chart

According to Image 2, it can be seen that the flow chart of research conducted at the Sacika ITTP Cooperative, namely in the context of data collection, the research uses interview techniques, observation, and documentation. Interviews were conducted with Sacika ITTP Cooperative staff at the DSP building on the 1st floor, while observations were made in the same area. Data collected through interviews includes problems when ordering and procuring alma mater and alma mater inventory. Performance measurement uses the SCOR model with level 1 matrix, namely plan, source, make, deliver, and return, and level 2 matrix, namely reliability, responsiveness, flexibility, cost, and assets. Parameters measured include POF, OFCT, COGS, and CTCCT.
POF Formula [22]:

$$\frac{Total\ orders - number\ of\ problem\ orders}{Total\ orders} \times 100\% \quad (1)$$

Description:
Total Orders : Total number of orders received
Number of problem orders : Number of orders with problems

The OFCT formula is the total time required for all orders to be delivered.
COGS Formula:
-COGS:

$$\frac{Beginning\ inventory - Purchases\ during\ the\ period}{Ending\ inventory} \times 100\% \quad (2)$$

Description:
Beginning inventory : Total inventory at the beginning of the period
Purchases during the period : The total amount of goods purchased during the period.
Ending inventory : The amount of inventory remaining at the end of the period.
-COGS(%) :

$$\frac{COGS}{Total\ orders} \times 100\% \quad (3)$$

Description:
COGS : Cost of Goods Sold
Total Orders : Total number of orders received

CTCCT Formula:

$$\frac{Supply\ inventory + Average\ accounts\ receivable}{Average\ accounts\ payable} \quad (4)$$

Description:
Supply inventory : Quantity of goods on hand
Average accounts receivable : The average amount of receivables over a period of time
Average accounts payable : The average amount of debt over a certain period of time.

The results of SCM performance

measurement are obtained by looking at four SCM parameters, namely reliability, responsiveness, flexibility, cost and assets. Then from the analysis of SCM performance measurement results will produce output in the form of SCOR CARD.

Data analysis can be done using the SCOR CARD Table:

Table 1. Scor Card

Performance Attributes	Matrix	Actual Data	Benchmark		
			superior	Advantge	parity
SupIy Chain Reliability	POF	%	%	%	%
SupIy chain Responsiveness	OFCT	Day	Day	Day	Day
SupIy chain cost	COGS	%	%	%	%
SupIy chain asset management	CTCCT	Day	Day	Day	Day

In Table 1, there are performance attributes consisting of 4 parts, namely supply chain reliability with POF matrix calculation to measure the extent of supply chain reliability in avoiding failures or problems that can affect the availability of goods, supply chain responsiveness with OFCT matrix calculation to measure supply chain responsiveness to customer demand, supply chain cost with COGS matrix calculation to measure the efficiency of production costs in the supply chain, supply chain asset management with CTCCT matrix calculation to measure the time it takes to convert financial investments into reusable cash flow.

Benchmarks are used to set performance targets and direct SCM development. Comparison between actual performance and benchmarks of similar companies is used to identify performance gaps and calculate opportunities. Gap Analysis helps set performance targets based on benchmark data. Supply chain improvement is based on SCM parameters, benchmarking, opportunities, and Gap Analysis to produce SCM improvement solutions. SCM performance improvement is the final stage to increase the success of Sacika ITTP Cooperative.

RESULTS AND DISCUSSION

The sacika cooperative network system has various entities involved, namely fabric suppliers (suppliers), convection (manufacturing), and sacika cooperatives (retail). The flow of the sacika cooperative supply chain starts with the selection of materials and colors from fabric suppliers. After that, it continues with sewing materials, packing goods, then stored in the warehouse to be delivered to the sacika cooperative. The next stage, the sacika cooperative sells to customers, namely ITTP students. Meanwhile, there is a flow in the illustration.

Description:
········▷ : flow of money
─────▷ : flow of products
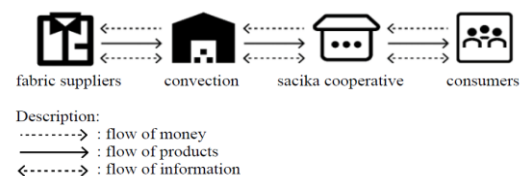◁········▷ : flow of information

Image 3. Sacika Cooperative Supply Chain Flow

The sacika cooperative supply chain flow consists of the flow of money, goods, and information. The flow of goods starts from fabric suppliers and convectors who make clothes according to the designs of sacika cooperatives and convectors who make clothes according to the designs of sacika cooperatives. The clothes are then marketed by the sacika cooperative and reach the consumers.

The flow of money in the sacika cooperative supply chain starts from the end consumer, then to the sacika cooperative, and on to the convection for payment of production debts and material suppliers for payment of material purchase debts. The flow of information

involves material suppliers, convectors, sacika cooperatives, and consumers, mai nly related to material availability and est imated production time. Communica tion between material suppliers and convec tors discusses material shortages or erro rs. Between the convection and the sacika cooperative, communication focus es on estimating production time and negoti ating prices. Sacika cooperatives commu nicate with consumers about product details such as materials and sizes.

The following are the results of the Sacika cooperative supply chain performance assessment :

Table 2. Matrix SCOR Level 1

Attribute	Matriks	Aktual	Benchmark		
			Superior	Advantage	Parity
SuppIy Chain Reliability	POF (%)	96,47	100	89,6	87,7
SuppIy Chain Responsiveness	OFCT (hari)	1	1	3	6
SuppIy Chain Cost	COGS	92,94	11,95	42,3	50,2
SuppIy Chain Assets	CTCCT(hari)	8	6	6	30

Table 2 shows the results of supe rior Sacika cooperative performance with the SCOR matrix according to business objectives. In POF, the actual value reac hed 96.47%, indicating good coope ration with suppliers and convection. OFCT is 1 day, indicating good service to custom ers. COGS reached 92.94%, indi cating cost effectiveness. CTCCT 8 days, healt hy money cycle. After setting the tar get, GAP Analysis is conducted to comp are with competitors, the difference is interpr eted as an increase in revenue. The GAP analysis table will be presented first with the aim of knowing the opportuni ties of each matrix.

CONCLUSION

In accordance with the research results above, it can be concluded that in the Sacika Cooperative Supply Chain, the entities involved are fabric suppliers, convection, and end consumers. Sacika Cooperative buys materials from fabric suppliers, then sends them to convection to be processed into alma mater and sold to students of Telkom Institute of Techn ology Purwokerto. POF reached 96.47%, not reaching the maximum target of 100%. OCFT Responsiveness is one day, has reached the target. HPP Chain Cost reached 92.94%, superior to competitors. SuppIy chain Assets CTCCT, sacika cooperative has a difference of 2 days with competitors.

In accordance with the research resu lts obtained above, the researchers provi de suggestions for increasing the speed of delivery of alma maters to increase POF, and minimizing production costs to increase COGS.

ACKNOWLEDGMENTS

BIBLIOGRAPHY

[1] L. H. Nirmayani, And N. Suastika, "Menumbuhkan Jiwa Kewirausaha an Melalui Koperasi Mahasiswa," Jurnal Pendidikan Ekonomi Undiksha, Vol. 15, No. 1, 2023

[2] F. F. Wati, R. Tan, M. Ayuni, M. Louisly, M. Sihombing, And E. Theofhilia, "Serat Acitya-Jurnal Ilmiah Untag Semarang Pengaruh Penerapan Manajemen Rantai Pas ok Dan Sistem Erp Pada Perusahaan Tesla Inc," *Oktober Management & Accountancy In*

Practice Journal, Vol. 11, No. 2, 2022.

[3] E. Rumahorbo, Wahyuda, And A. Profita, "Perancangan Dan Pengukuran Kinerja Supply Chain Dengan Menggunakan Metode Scor," *Jurnal Manajemen & Teknik Industri – Produksi*, Vol. Volume Xxii, No.1, 2021.

[4] O. Dwi, R. P. Manajemen, F. Ekonomi, And D. Bisnis, "Analisis Kinerja Manajemen Rantai Pasok Produk Kecap Dengan Menggunakan Metode Supply Chain Operation Reference (Scor) Di Perusahaan Kecap Cap Jago Parigi Kabupaten Pangandaran," *Prosiding Manajemen*, Vol. Volume 6, No.2, Pp. 734–738, 2020.

[5] R. B. Subekti, "Pengukuran Kinerja Rantai Pasok Buku Dengan Metode Supply Chain Operation Reference (Scor) Pada Cv. Arya Duta," Jurnal Indonesia Sosial Teknologi, Vol. 1, No. 2, Pp. 112-123, September 2020.

[6] I. P. Wulandari, W. L. Setyaningsih, A. Prabu, W. Wardhana, And Y. Jumaryadi, "Sistemasi: Jurnal Sistem Informasi Implementasi Metode Scor 11.0 Dalam Pengukuran Kinerja Supply Chain Management," 2021.

[7] I. B. Suryaningrat, "Penerapan Metode Green Supply Chain Operation Reference (Gscor) Pada Pengolahan Ribbed Smoke Sheet (Rss) (Studi Kasus Di Ptpn Xii Sumber Tengah Silo, Jember)," *Agrointek*, Vol. Volume 15 No.1, Pp. 282–293, 2021.

[8] J. Zaenal Mutaqin, "Pengukuran Kinerja Supply Chain Dengan Pendekatan Metode Scor (Supply Chain Operations Reference) Studi Kasus Di Pt Xyz," Jurnal Logistik Indonesia, Vol.5, No1 , Pp. 13-23, April 2021.

[9] A. Puspitaningrum, D. Mustika Kusumawardani, M. Yoka Fathoni, J. Di Panjaitan No, K. Purwokerto Selatan, And J. Tengah, "Analisis Supply Chain Management Dalam Peningkatan Produksi Nopia Mino Menggunakan Scor Model Supply Chain Management," Sistemasi: Jurnal Sistem Informasi, Volume 11, Nomor 2, Pp. 337-351, Mei 2022.

[10] D. Nur Zuraidah, R. Kemal Rasyid, S. Nandasari, Y. Amrozi, And J. A. Yani No, "Efektivitas Metode Scor Untuk Mengukur Performa Scm (Sebuah Studi Literatur)." Jurnal Bina Komputer, Vol. 3, No. 1, Pp. 15-23, Februari 2021.

[11] N. Yusrianafi And S. Salim Dahda, "Pengukuran Kinerja Pada Ukm Kerudung Menggunakan Metode Supply Chain Operator Reference (Scor) Dan Ahp," *Jurnal Ilmiah Mahasiswa Teknik Industri Universitas Kadiri*, Vol. 3, No. 2, Pp. 131–146, 2021.

[12] J. S. Celina, D. M. Kusumawardani, And M. Y. Fathoni, "Evaluasi Kinerja Rantai Pasok Perpustakaan Institut Teknologi Telkom Purwokerto Menggunakan Supply Chain Operational Reference (Scor) Model Berbasis Objective Matrix (Omax)," *Jurikom (Jurnal Riset Komputer)*, Vol. 9, No. 2, P. 296, Apr. 2022.

[13] I. S. Fauziyah, A. Y. Ridwan, And P. S. Muttaqin, "Food Production Performance Measurement System Using Halal Supply Chain Operation Reference (Scor) Model And Analytical Hierarchy Process (Ahp)," In *Iop Conference Series:*

Materials Science And Engineering, Iop Publishing Ltd, Dec. 2020.

[14] H. Sarjono And A. Teguh Suprapto, "Supply Chain Performance Measurement With Method Scor Model In Service Company," Proceedings of the Second Asia Pacific International Conference on Industrial Engineering and Operations Management , 2021.

[15] H. Subagyo, P. Ricardianto, E. B. Setiawan, J. Simarmata, And S. W. Pratiwi, "Supply Chain Performance Measurement Of Logistic Business Using Scor Model In The Indonesian Main Ports," International Journal of Scientific Engineering and Science , Volume 5, Issue 12, Pp. 100-106, 2022.

[16] B. Swardhana Putra, V. Noor Helia, And N. Faisol, "Measuring Performance Of Halal Supply Chain Using Analytical Hierarchy Process (Ahp) And Supply Chain Operations Reference (Scor) 12.0 Approach: A Case Study," Published by Atlantis Press International B.V., Vol. 210, Pp. 360-367, 2022.

[17] A. Sutoni, A. Subhan, W. Setyawan, F. O. Bhagyana, And Mujiarto, "Performance Analysis Using The Supply Chain Operations Reference (Scor) And Ahp Method," In *Journal Of Physics: Conference Series*, Iop Publishing Ltd, Feb. 2021.

[18] Z. F. Ikatrinasari, N. Harianto, And E. I. Yuslistyari, "Improvement Of Supply Chain Performance Of Printing Services Company Based On Supply Chain Operation References (Scor) Model," *Uncertain Supply Chain Management*, Vol. 8, No. 4, Pp. 845–856, 2020.

[19] I. Zulkarnaen, N. Siswanto, And I. Vanany, "Modeling Of Beef Supply Chain Performance Measurement Information System Based Scor," In *Iop Conference Series: Earth And Environmental Science*, Institute Of Physics, 2022.

[20] F. Dianawati And K. Z. Zamzamy, "Designing Performance Improvement Strategy In Automotive Companies Using Scor Model And Importance Performance Analysis," In *Journal Of Physics: Conference Series*, Iop Publishing Ltd, Nov. 2021.

[21] D. M. Janaki, H. Izadbakhsh, M. Hatefi, M. Yavari, And M. K. Samani, "Supply Chain Network Performance Measurement And Improvement Using Dea And Scor Models In Dynamic Conditions," *Advances In Industrial Engineering*, Vol. 56, No. 2, Pp. 163–197, 2022.

[22] A. B. Saluy, D. Sinaga, S. Madelan, And A. Badawi, "Analysis Supply Chain Management Performance Using Scor Method In Compressor Distributor Company At Pt. Pola Petro Development," International Journal of Innovative Science and Research Technology, Volume 6, Issue 2, Pp. 91-102, 2021.