Business Unit Utilization in Supply Chain of Distribution Channel

Fitra Lestari[1] (iD), Rahmad Kurniawan[2] (iD), Kamariah Ismail[3] (iD), Mawardi Mawardi[4] (iD),
Tengku Nurainun[1] (iD), Ilham Hariadi[1] (iD)

[1]Industrial Engineering Department, UIN Sultan Syarif Kasim (Indonesia)
[2]Informatic Engineering Department, UIN Sultan Syarif Kasim (Indonesia)
[3]Universiti Teknologi Brunei (Brunei Darussalam)
[4]Islamic Economic Department, UIN Sultan Syarif Kasim (Indonesia)

*fitra.lestari@uin-suska.ac.id, rahmadkurniawan@uin-suska.ac.id, kamariah.ismail@utb.edu.bn, mawardi@uin-suska.ac.id,
t.ainun@uin-suska.ac.id, Ilhamhariadi11@gmail.com*

Abstract:

Purpose: The Supply chain strategy serves to strengthen positioning in competing to serve customers. This study examines the business unit in the supply chain strategy in producing food products from Cowhide in Indonesia. There are many business units with high demand for rawhides from cattle for use as food products which form several distribution channels. Thus, this opportunity is utilized to increase the productivity of business units in Indonesia. This study aims to determine the business unit utilization in the supply chain of distribution channel by considering patterns of business processes, value-added products, and optimal supply chain strategies.

Design/methodology/approach: The study interviews 18 business units of Cowhide in Indonesia, including two slaughterhouses, five cattle owners, three restaurants, two cowhide drying business units, one cowhide cracker business unit, three cowhide traders' traditional markets, one cowhide boiler business unit, and one retail shop. The SCOR model, Hayami, and discrete event simulation are integrated to analyze business unit utilization in Cowhide's food products' supply chain of distribution channel.

Findings: There are five distribution channels from 7 business units in food products. Then, the highest value-added product ratio was the cowhide cracker business unit at 31%. Finally, Channel 1 is the highest utilization rate of 40%. Moreover, the policymaker can study non-food products to compare cowhide raw materials' business unit utilization because Indonesia has many of these raw materials and is easy to obtain.

Research limitations/implications: Further study is suggested to measure each business unit's performance in the supply chain of distribution channel and then strengthen institutions to increase productivity.

Originality/value: This study needs to measure each business unit's performance in strengthening its supply chain strategy to optimize the distribution channel. This study's implication can contribute to business units in improving their business processes and stakeholders in the decision-making process, including associations, communities, cooperatives, and the Government, in increasing the potential for economic growth on SMEs in especially of Cowhide.

Keywords: supply chain, distribution channel, business unit, utilization, food product, cowhide, SCOR model

To cite this article:

1. Introduction

Supply chain strategy involves several business units that interact in achieving organizational goals. Currently, competition in the global market encourages business units to collaborate to carry out business processes. A study stated that the business unit's improvement in the supply chain strategy could be determined based on operational production costs and product processing time for suppliers, manufacturers, distributors, and consumers (Antoniolli, Ferreira, Jesus, Argoud & Júnior, 2015). Then, several studies also discuss how to streamline the relationship between business units through several strategies in supply chain management. A study examines the evaluation of collaborative business units through measuring performance in supply chain strategies. The results show that distribution channels were the most common factors in program evaluation (Simpson, Siguaw & White, 2002). Then, there is a study about environmental issues in manufacturing able to be improved through the supply chain strategy (Yang, Wang & Song, 2020). Finding found that determines the optimization of existing distribution channels affects supply chain strategy in achieving optimal profit. Thus, it concludes that distribution channels more affect supply chain strategy in collaborating between business units in order to evaluate the added value of products. Business process evaluation can be done by measuring the utility of the business unit. A study explains that measuring utility in business units can optimize business processes (Pirolo, Ray, Gadzinski, Manese, Garvert, Scoville et al., 2009). This research is necessary to evaluate business unit utilities in the supply chain strategy of distribution channels. However, limited studies were found to discuss the business unit's utility to determine the added value of products in the supply chain of distribution channel. Business unit utilization needs to be researched to balance supply chain strategy and strengthen positioning in competing to serve consumers.

This study takes an object in the business unit that produces products from Cowhide in Indonesia. Cowhide's use as raw material for gelatin has been widely studied (Sasmitaloka, Miskiyah & Juniawati, 2017). The business unit that produces Cowhide is a slaughterhouse. Thus, a large number of cattle slaughtered results in a large number of raw Cowhide produced. Cowhide is a byproduct of the Slaughterhouse and is the outermost part of the body of cattle separate from the body (Ismadhia, Ridwan & Hadi, 2018). Cowhide is used as an alternative raw material for producing gelatin. The collagen content in mammal skin is 89%, while the proportion of Cowhide reaches 6.84-8.11% (Sasmitaloka et al., 2017). Cowhide production has high demand in Indonesia because it can be processed into several other derivative products and has economic value. Several business units are involved in processing products from Cowhide including suppliers, the processing industry, distributors and consumers. In addition, products from Cowhide in Indonesia are produced in food and non-food products. This is evidenced by several business units that sell food products in traditional markets and the retail industry. Then, for non-food products, several business units produce these raw materials into clothing and distribute them to the international market.

The supply chain strategy for cowhide products in Indonesia coordinates and collaborates with suppliers and customers to improve service quality. The business unit producing food products from Cowhide in Indonesia is fundamental because it has a close marketing distribution channel to its raw material. Thus, this study focuses on food products made from Cowhide. There are several supply chain approaches needed in this study. Researchers use the SCOR model to form a supply chain strategy and measure its performance (Kersten & Saeed, 2014; Persson, Bartoll, Ganovic, Lidberg, Nilsson, Wibaeus et al., 2012). This approach can model supply chain strategies among business actors. However, this is limited in determining the variable operating costs. To calculate operational costs between business actors, this study needs to integrate the Hayami method into the supply chain strategy (Permata, Kusumanto, Papilo, Rosanda & Asrol, 2018; Asrol, Marimin & Machfud, 2017). Furthermore, the need for added value analysis of cowhide products is related to the product's processing time to carry out production

activities. Researchers measured the production system's performance based on time variables by implementing a discrete event simulation approach (Kampa, Golda & Paprocka, 2017; Owida, Byrne, Heavey, Blake & El-Kilany, 2016). Thus, this study's problem is focused on determining the business unit utilization of added value for food products in the supply chain of the distribution channel in Indonesia.

This study includes a review of supply chain management related to business unit utilization which results in added value products to increase business unit sustainability. Thus, to propose some strategies to achieve Cowhide's business unit's target, this study has several objectives. First, this study aims to determine Cowhide's food products' business process using the Supply Chain Operation Reference (SCOR) method. Second, this study aims to determine the added value for Cowhide's processed food products in the supply chain strategy using the Hayami method. This study aims to determine the optimal cowhide supply chain strategy using a Discrete Event Simulation. The scope of the study was conducted on the food supply chain made from Cowhide. The study also was conducted on the supply chain of distribution channel of the primary raw materials from the Slaughterhouse to consumers in Indonesia.

2. Supply Chain of Distribution Channel

An organization uses the supply chain strategy to distribute goods and services to its customers. This strategy is also a network of interconnected organizations to regulate the procurement or distribution of goods (Ma, Wang & Shang, 2013). In addition, the Supply Chain Operation Reference (SCOR) model is a conceptual model developed by the Supply Chain Council (SCC). This model provides standards for institutions, organizations, or industries to facilitate understanding of supply chains as a first step in obtaining an effective and efficient supply chain management (Delipinar & Kocaoglu, 2016). Furthermore, the SCOR Model can design a process-based supply chain performance measurement system to evaluate supply chain performance holistically to determine improvements in creating a company's competitive advantage (Junior & Carpinetti, 2016).

The interaction between business units is expected to be more efficient and effective to strengthen the value chain in providing products to consumers. In addition, the supply chain strategy is caused by transactions between business units that collaborate to provide products for final consumers. The product transformation of each business unit provides an increase in the value chain in serving consumer needs. The research discusses that the supply chain strategy has succeeded in measuring the added value of the product, which consists of several product variants (Lestari, Ismail, Bakar, Hamid & Sutupo, 2014). This aims to support the business unit in evaluating its strategy to provide products for consumers. Other studies also found that changes in the added value of the product in the supply chain strategy needed to be analyzed because the decision-maker needed to determine the marketing distribution strategy (Green, Whitten & Inman, 2012). Thus, the need for analysis of product added value between business units is urgent to achieve the objectives of the supply chain strategy.

Analysis of the product's added value needs to be examined because it relates to the availability of raw materials, production management, technology used, institutional markets, and environmental factors. Increasing the added value of products is a strategy that must be owned by a business unit with the aim that its products can be attracted by consumers and can increase system performance. A study stated that a product's added value is determined based on the production process, transportation, and storage of a product (Sashi, Singh & Shabani, 2016). Furthermore, they explained many indicators to measure products' added value, including product packaging, good service to consumers, and providing rewards to loyal customers. One of the methods used to analyze the added value of a product is the Hayami method. A study uses the Hayami method to determine the added value of products influenced by several factors including raw materials, production management, technology level, market institutions and the environment (Saputra, Nazir & Yenrina, 2018). Furthermore, determining added value in the Hayami method is carried out in two ways including added value for production activities and added value for marketing. The added value for production processing is influenced by the production capacity and the number of raw materials used for labor. Meanwhile, market factors that influence are output prices, labor wages, raw material prices and other input values (Rachman, Cahyadi & Hardjomidjojo, 2017).

The added value product is influenced by the distribution channel because it is difficult for every firm to sell its products directly to the end-user. The product flow from raw materials to finished products for consumers goes

through a series of marketing processes from several business units. Thus, the difference in the value chain between the transformed products was found. Several studies have found that distribution channel decisions strengthen the competitive supply chain strategy. A study examined distribution channel decisions for competing supply chains with a focus on service competition affecting the distribution channel (Xia, Xiao & Peter-Zhang, 2019). The result offers several managerial insights to better understand the distribution channel decisions in the competitive setting which is impacted by price and service dimensions. Then, there is also a study that investigated the distribution channel of a Green product on supply chain strategy (Xing, Zou & Liu., 2017). Results showed that the selection of the best distribution channel was an alternative tool for competing with its competitors. Obviously, stakeholders are expected to be able to choose the best distribution channel to increase the competitiveness of the supply chain.

The efficient supply chain of distribution channels needs to be determined for decision-making tools by stakeholders. Discrete event simulation is a type of simulation modeling representing a system as a discrete sequence of events at one time. This model assumes no sequential process changes. This approach aims to conduct several experiments to evaluate system performance (Owida et al., 2016) and increase system productivity (Kampa et al., 2017). This approach's implementation can be used for industrial services related to queuing processes such as bank tellers where the number of customers queuing changes discretely, determining the amount of inventory in warehouses and determining cycle times in supply chain strategies. The scenarios that apply to business processes in supply chain strategy are unique and require special consideration. In this scenario, there are multiple flows such as the product's physical flow, the flow of information, and the relationships between entities. The process is random and interdependent allowing discrete event simulations to be implemented (Degeling, Koffijberg, Franken, Koopman & IJzerman, 2019; Karnon, Stahl, Brennan, Caro, Mar & Möller, 2012). Furthermore, this method can represent the entire process flow of raw materials into finished products. This approach can be studied using simulation software to improve system performance in increasing product added value. The discrete event simulation approach can be used as a decision-making tool to solve supply chain strategy problems. Thus, this study needs to integrate several methods for the decision-making process in the supply chain of distribution channels.

3. Research Design

The food products from cowhide involves several business units to serve consumers. Thus, there is involvement between business units to form a supply chain of distribution channel.

3.1. Determining the Business Unit Utilization

The supply chain strategy in this case study needs to be strengthened to provide products from the business unit to consumers effectively and efficiently. This problem is categorized into a supply chain strategy that is expected to be able to improve the value chain by evaluating value-added products produced by business units. Distribution channels affect the added value of the product in this study because the procurement of raw materials into finished products goes through a series of processes from the business unit. Ideally, the business unit provide the finished product directly to the end user. However, the existence of various types of market needs encourages product transformation into several product variants. Thus, the purpose of this paper is to determine the business unit utilization in the supply chain of distribution channel through the description of the product supply process from upstream to downstream.

3.2. The Stages of Problem Solving

a qualitative approach was adopted to identify business processes in this study. A study states that the qualitative approach can be implemented for mapping business processes (Alford, 2005). Then, they explained that the observation and interview of the research object could find out in detail the activities that occurred on a problem. To represent the real conditions in a system, this can adopt the Sampling method in selecting data in a study. Moreover, this research is implemented in several business units that process food products from Cowhide in Indonesia. Leather is a byproduct of slaughtering livestock and is the outermost part of the cow's organs. Cows' skin contains protein, fat, and skin chitin (Rapika, Zulfikar & Zumarni, 2016). In Indonesia, several business units produce end products for consumers from livestock hides. In general, cowhide products in Indonesia can be classified into food and clothing products. Figure 1 shows the business unit of cowhide products in Indonesia.
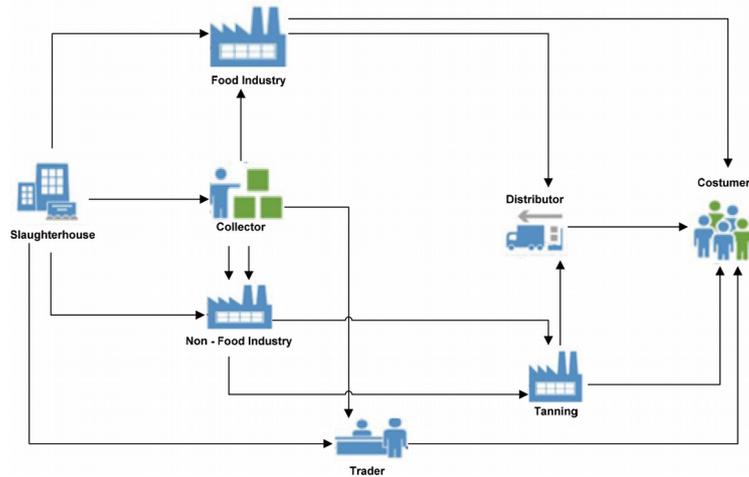
Figure 1. Business units of cowhide products in Indonesia

Data collection in this study is divided into primary data and secondary data. Primary data was obtained through interviews with business units in food products made from Cowhide, including slaughterhouse managers, cattle owners, Cowhide cracker business unit, restaurants and cowhide traders in traditional markets to processed consumers cowhide products. Several secondary data documents include the number of cattle slaughtered in several years and data on the percentage of Cowhide produced from a cow. The supporting data from the business units include production costs for processing food products made from Cowhide. Moreover, direct systematic observation and recording of the study object are carried out by visiting the business unit in carrying out its production activities. To obtain detailed data, this study used an open-ended interview instrument to respondents (Haradhan, 2018). Interviews were conducted with business units in slaughterhouses, restaurants, cowhide food products of the processing industry, cowhide sellers in traditional markets, and several consumers. The research instrument is built based on the Supply chain management approach including suppliers, manufacturers, distributors and consumers. Then, nonprobability sampling through the purposive sampling method was adopted in this study. A study explains that respondents are selected based on specific considerations such as their ability or strength in providing data and information specific and needed by researchers (Haradhan, 2018). This study's sampling consisted of 18 business units including 2 slaughterhouses, 5 cattle owners, 3 restaurants, 2 cowhide drying business units, 1 cowhide cracker business unit, 3 cowhide traders in traditional markets, 1 cowhide boiler business unit, and 1 retail store. Data analysis in this study was carried out based on the supply chain of distribution channel of food products from Cowhide. This research requires integrating several methods including the Supply Chain Operations Reference (SCOR) model, the Hayami method and the discrete event simulation. Figure 2 stages of data analysis on the supply chain of distribution channel of food products from Cowhide.
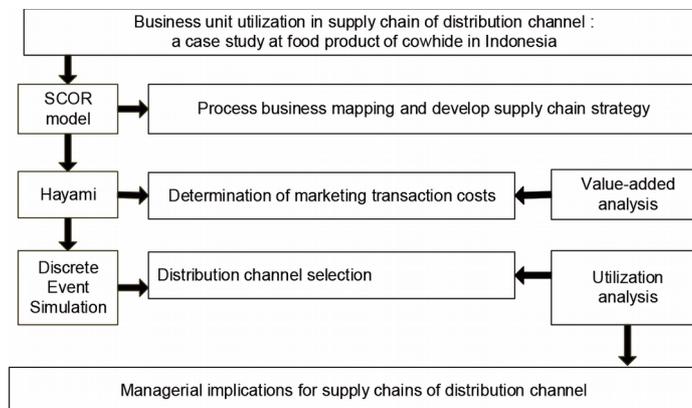
Figure 2. The stages of business unit utilization on the Supply
Chain of Distribution Channel for food products of Cowhide

4. Finding

There are several business units involved in the food supply chain of distribution channel which consists of suppliers, manufacturers, retailers and consumers. Figure 3 is the cowhide product's food supply chain strategy, which outlines the 5 channels in this case study. Besides, The SCOR model has succeeded in mapping the business process of food products from Cowhide. Figure 4 is a mapping of the supply chain of distribution channel using the SCOR model. The supply chain strategy in this case study has 5 different channels due to the business units' pattern. In addition, the business unit in the supply chain of distribution channel for food products made of Cowhide shows that several business units influence this business. Initially, the supplier of cattle was the owner of the cow in collaboration with the Slaughterhouse. The cattle owner has a source-to-order business strategy in which the demand for cattle is based on consumer needs. The Cowhide food processing business unit, including cowhide drying business unit, restaurant and Cowhide cracker business unit, has a make-to-stock business strategy. Therefore, the raw materials for cowhide products obtained from cattle owners are always available because these products are not stored or are not needed by cow owners. The raw cowhide product is then distributed to the business unit to be processed and sold to consumers. Traditional markets and retail have a delivery-to-order strategy because they order products when the products are sold out. Thus, this business unit orders other business units to meet consumer needs.
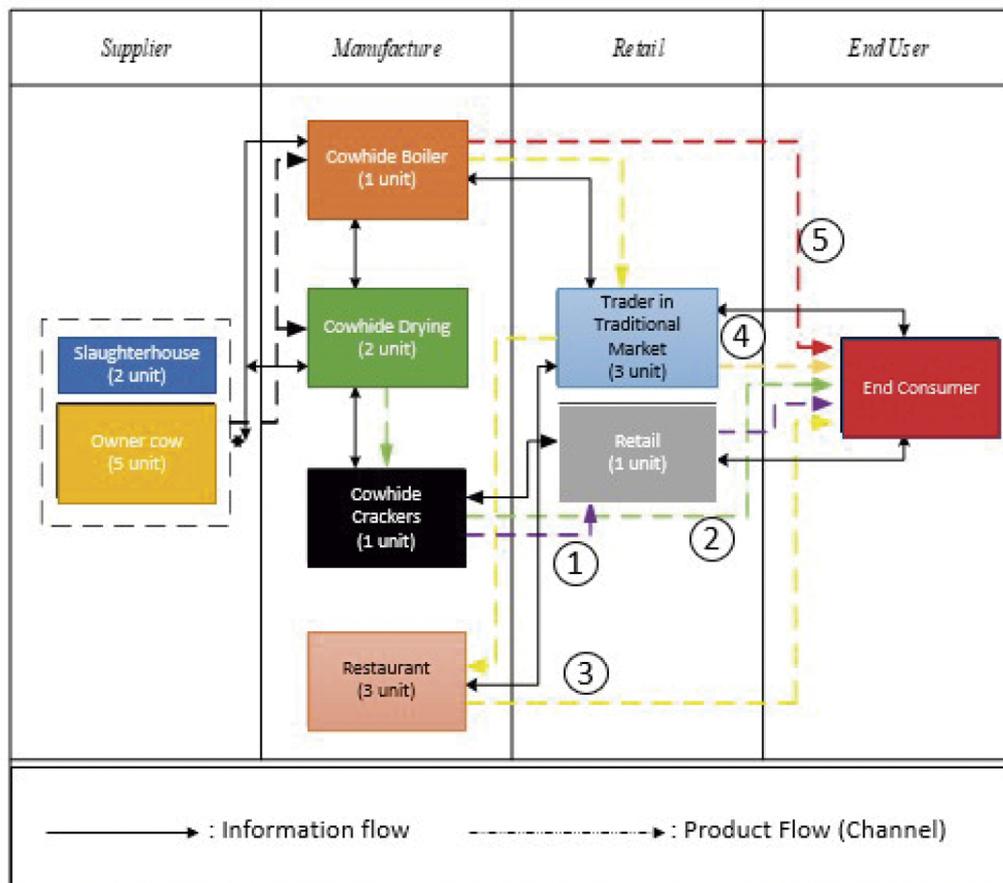
Figure 3. Food supply chain of distribution channel on cowhide product

5 distribution channel involves:

- Channel 1: Slaughterhouse – Cowhide drying business unit – Cowhide crackers business unit – Retail stores - Consumers.
- Channel 2: Slaughterhouse – Cowhide drying business unit – Cowhide crackers business unit – Consumers

- Channel 3: Slaughterhouse – Cowhide boiler business unit – Traditional market traders – Restaurants – Consumers.
- Channel 4: Slaughterhouse – Cowhide boiler business unit – Traditional market – Consumers.
- Channel 5: Slaughterhouse – Cowhide boiler business unit – Consumers.
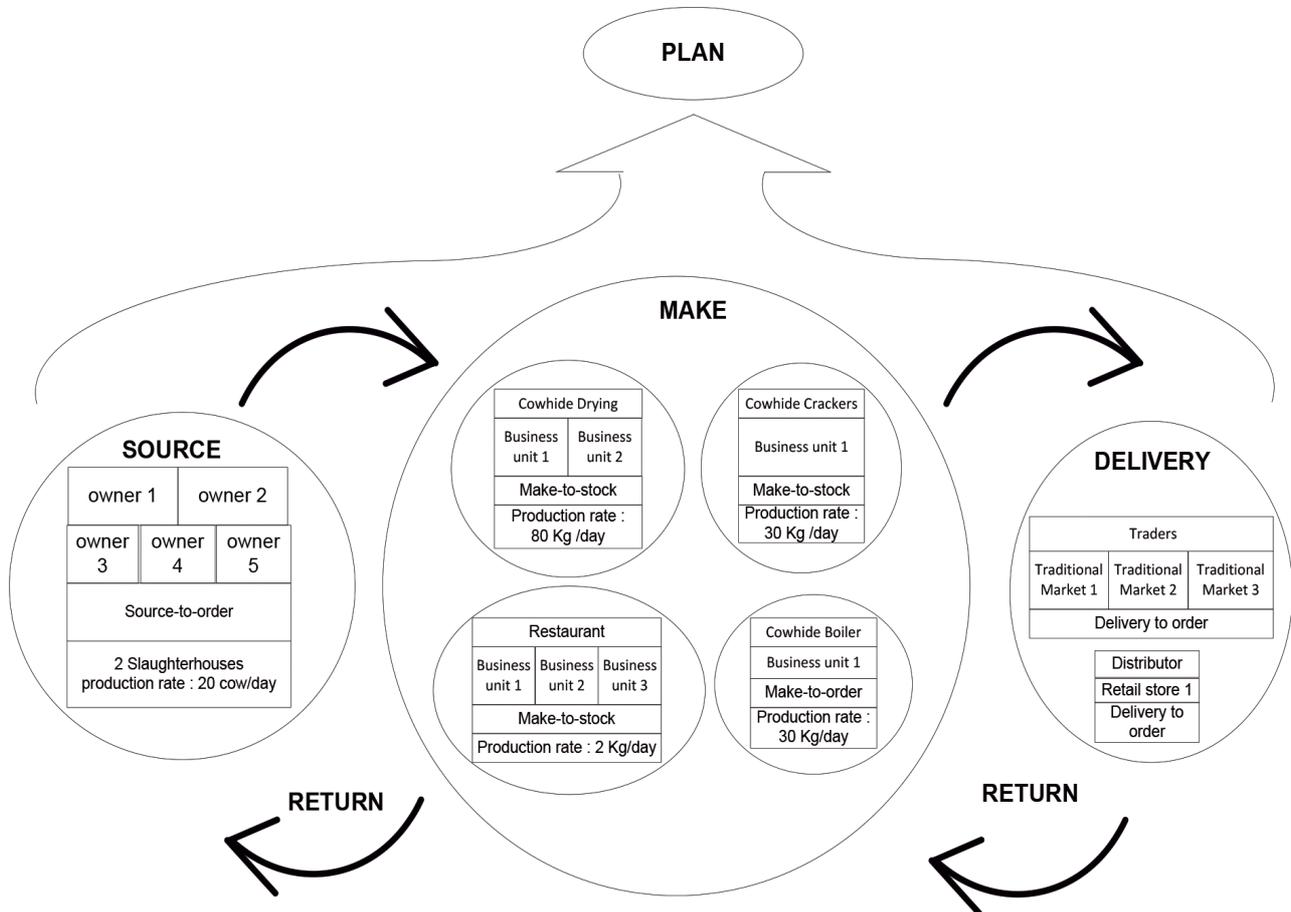
Figure 4. Supply chain of distribution channel using the SCOR model

The added value of Cowhide's food products on the Supply chain of distribution channel was analyzed using the Hayami method. Value-added products in the supply chain of distribution channel have different values based on each supply chain entity's input, process, and output. Table 1 is the calculation result of the added value of Cowhide's food products for each business unit. The difference in added value to the product is due to the input and output values in the production process in finished products. The highest value-added ratio was the cowhide cracker business unit at 31%. Then, the lowest value-added ratio is the restaurant business unit by 4%. Moreover, the determination of the added value of food products from Cowhide is adopted to study product transformation from raw materials to finished products. The added value of this product is calculated based on the business unit's production activities that are carried out to become the final product. This study succeeded in finding 7 business units involved in food products from Cowhide. Figure 5 is the value-added product and profit from the business unit in food products from Cowhide. These results indicate differences in added value based on the advantages and value-added ratios of each business unit. The total added value is calculated based on the difference between the purchase price and the final product selling price in each business unit. A significant difference in added value is also affected by the varying prices of raw materials and production costs. The skin cracker business unit has the most significant added value because 1 kilogram of dry skin products can produce an average of 200 packs of skin crackers for sale. Thus, the added value of the product in this business unit is high.

No	Variable	Unit	Supplier	Manufacture				Distributor	
			Cattle Owner	Cowhide Drying Business	Cowhide Crackers Business	Cowhide Boiler Business	Restaurant	Traditional Market Traders	Retail stores
			Supply Chain Interaction						
1	Prices of Purchase Material [a]	Rp	20.000	23.000	73.000	23.000	44.000	38.000	160.000
2	Price of Product Selling [b]	Rp	23.000	73.000	160.000	38.000	80.000	44.000	200.000
3	Total Value Added per kg of output [c] = [b]- [a]	Rp	3.000	50.000	87.000	15.000	36.000	6.000	40.000
			Input, Output, and Prices						
1	Output (sales volume) [d]	Kg	30	12	12	25	1	10	1
2	Output (Sale value) [e] = [d]* [b]	Rp	690.000	876.000	1.920.000	950.000	80.000	440.000	200.000
3	Basic raw materials [f]	Rp	600.000	690.000	876.000	690.000	44.000	380.000	160
4	Direct workforce [g]	HOK	3	2	2	1	1	1	1
5	Conversion factor [h] = [e] / [f]	%	1:15	1:27	2:19	1:38	1.82	1:16	1:25
6	Coefficient of direct workforce [i] = [f] / [g]		200	345	438	690	44	380	160
7	Wage of direct workforce [j]	Rp	68.000	50.000	50.000	50.000	0	0	0
			Incomes and value-added						
1	Other input prices (Production) [k]	Rp	10.000	45.000	400.000	35.000	32.000	0	0
2	Other input prices (Non-Production) [l]	Rp	0000	0000	50.000	0000	1.000	2.000	0
3	Value-added [m]=[e]-[f]+[k]+[l]	Rp	80.000	141.000	594.000	225.000	3.000	58.000	40.000
4	Ratio of value added [n]= [m]/[e]*100	%	12%	16%	31%	24%	4%	13%	20%
5	Profit [o]= [m] -[j]	Rp	12.000	91.000	544.000	175.000	3.000	58.000	40.000
6	Profitability [p]=[o] /[e]*100	%	2%	10%	28%	18%	4%	13%	20%
			Owner Rewards Factor Production						
1	Margin [q]= [e]- [f] +[k]	Rp	80.000	141.000	644.000	225.000	4.000	60.000	40.000
2	Contribution of other input costs [r] = [k]+ [l]/ [q]*100	%	13%	32%	70%	16%	825%	3%	0%
3	Company profits [s]= [o]/[q]*100	%	15%	65%	84%	78%	75%	97%	100%

Table 1. Value-added food product of cowhide

The 5 distribution channels of food products made from Cowhide were analyzed using discrete event simulation by comparing the number out, waiting time and utilization. The input data is simulated using the input analyzer in the Arena software. This study found that there are significant differences from each existing channel. The Cowhide Drying Business unit's production process takes quite a long time, up to 15 hours. This resulted in an accumulation of raw materials. Then, the waiting time on channel 3 is not considerable, and it occurs only 18 hours in one month. This shows that the production process is going well. However, the utilization of this channel shows a low value. Channel 4 has a low waiting time and high utilization of 38%. Finally, the channel with the highest utilization rate is channel 1 at 40%. Figure 6 is a comparison of 5 supply chain of distribution channels.
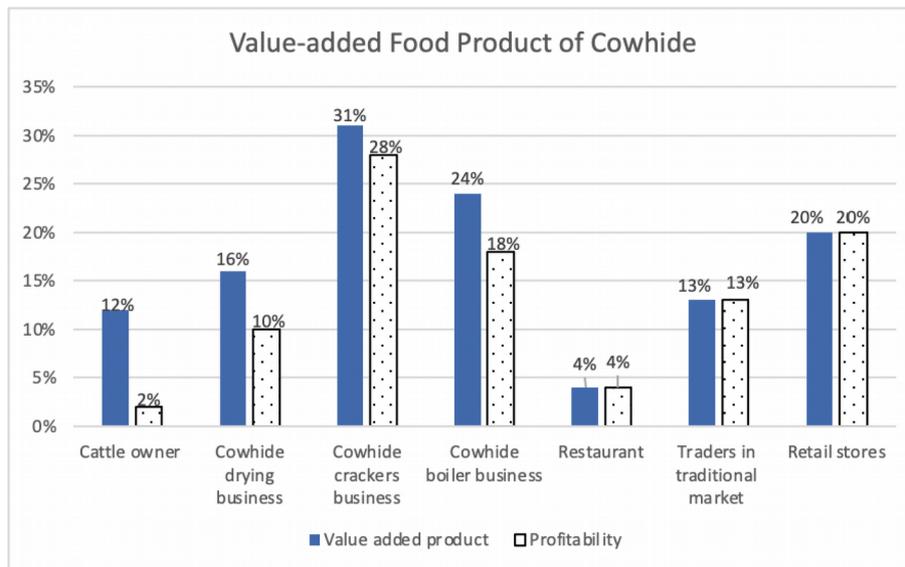
Figure 5. Value-added of food product
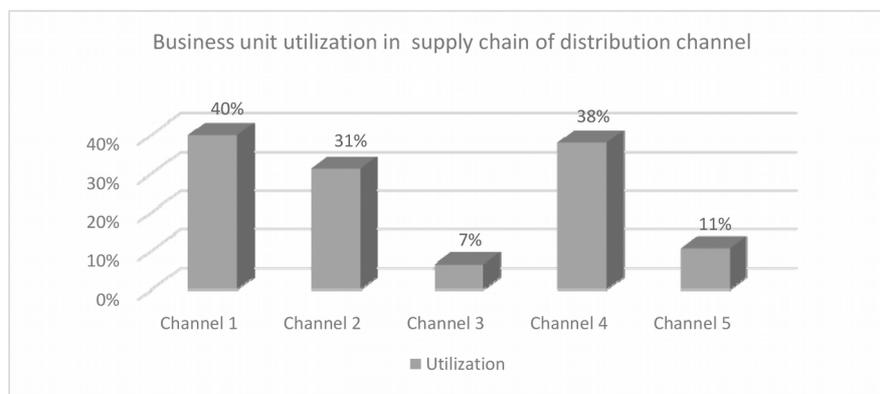
Figure 6. Business unit utilization in supply chain of distribution channel

5. Discussion

The business process for cowhide products in Indonesia is divided into food and non-food products. This research then focuses on food products to examine Indonesia's local business units that collaborate to serve consumers.

5.1. Food Product of Distribution Channel

There are 5 distribution channels found in this study based on business process mapping. This channel is limited based on food products from the interaction between business units from upstream to downstream in this case study using the SCOR model. This tool has succeeded in describing the interactions between business units in the supply chain strategy. Then, this also provides benefits for elaborating distribution channels from suppliers as

suppliers of raw materials, business units as product developers, retailers to consumers. Several studies have also used the SCOR model to describe business processes from upstream to downstream with various objectives for the decision-making process (Huan, Sheoran & Wan, 2004; Putro, Purwaningsih, Sensuse, Suryono & Kautsarina, 2022). Another research also uses this tool to describe the business process of business units using management strategies with partnerships including source to order, make to stock, make to order, deliver to order and other strategies (Golparvar & Seifbarghy, 2009). Thus, this channel distribution can identify the interaction pattern between business units.

5.2. Value-added Products

Moreover, this study found determining of the added value of cowhide products in each business unit. Supply chain of distribution channels need to be found to determine the increase in products' added value from raw materials to final products. It is intended that the business unit can determine the strategy and product selection to provide to consumers. The difference in the value added product ratio in each business unit shows that the various values of product transformation obtained by the business unit. Then, it also provides the difference in profit received by the business unit in accordance with the operating process and the use of facilities to support the production system. Several study stated that determining a product's added value can provide maximum profitability and service to consumers (Permata et al., 2018). Then, the supply chain of distribution channel study provides information to stakeholders and policymakers to make policies to increase business units' productivity. Moreover, the supply chain of distribution channel needs to be evaluated to improve the performance of the business unit.

5.3. Optimal Supply Chain Strategies

This research has proven that the determination of utilization in the supply chain of distribution channel can describe the business unit's ability to serve consumers. The 5 channels found in this study are compared based on their utilization. The selected channel 1 has the most extensive utility at 40%. This utilization is still not optimal and needs to be improved. Thus, policy makers and practitioners can evaluate their strategies in improving this competitive supply chain. Utilization close to 100% is interpreted that the use of resources from business units in the supply chain strategy is excellent (Kotzab, Teller, Grant & Friis, 2015). A study also states that the best utility will strengthen the supply chain strategy to win the global market (Mukhamedjanova, 2020). Business units are encouraged to optimize their products' added value by considering production costs and available resources. Thus, increasing the added value of the product can increase the utility in the suppl chain of distribution channel.

6. Conclusion

The Supply chain channel of Cowhide by integrating the SCOR model, Hayami and Discrete event simulation, has succeeded in determining the Business unit utilization of food products. This study can also show promising results in the form of cost efficiency and production time by considering the existing raw materials for each business unit. This research implies that it can contribute to business units in improving their business processes and stakeholders in the decision-making process, including associations, communities, cooperatives, and the Government, increasing the potential for economic growth on SMEs, especially of Cowhide. Moreover, the policymaker can study non-food products to compare cowhide raw materials' business unit utilization because Indonesia has many of these raw materials and is easy to obtain. To optimize the supply chain channel, this study needs to measure each business unit's performance in strengthening its supply chain strategy. Further study is suggested to measure the performance of each business unit in the supply chain channel and then strengthen institutions to increase productivity.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

References

Alford, P. (2005). A Framework for Mapping and Evaluating Business Process Costs in the Tourism Industry Supply Chain. In *Information and Communication Technologies in Tourism 2005* (125-136). Springer-Verlag. https://doi.org/10.1007/3-211-27283-6_12

Antoniolli, P.D., Ferreira, J., Jesus, V.C., Argoud, A.R.T.T., & Júnior, J.B.C. (2015). Outsourcing of logistics transport: A Brazilian leather industry case study. *Forum Empresarial*, 20(2), 1-29. https://doi.org/10.33801/fe.v20i2.3312

Asrol, M., Marimin, & Machfud (2017). Supply Chain Performance Measurement and Improvement for Sugarcane Agro-industry. *International Journal of Supply Chain Management*, 6(3), 8-21.

Degeling, K., Koffijberg, H., Franken, M.D., Koopman, M., & IJzerman, M.J. (2019). Comparing Strategies for Modeling Competing Risks in Discrete-Event Simulations: A Simulation Study and Illustration in Colorectal Cancer. *Medical Decision Making*, 39(1), 57-73. https://doi.org/10.1177/0272989X18814770

Delipinar, G.E., & Kocaoglu, B. (2016). Using SCOR Model to Gain Competitive Advantage: A Literature Review. *Procedia - Social and Behavioral Sciences*, 229, 398-406. https://doi.org/10.1016/j.sbspro.2016.07.150

Golparvar, M., & Seifbarghy, M. (2009). Application of SCOR Model in an Oil- producing Company. *Journal of Industrial Engineering*, 4, 59-69.

Green, K.W., Whitten, D., & Inman, R.A. (2012). Aligning marketing strategies throughout the supply chain to enhance performance. *Industrial Marketing Management*, 41(6), 1008-1018. https://doi.org/10.1016/j.indmarman.2012.02.003

Haradhan, M. (2018). Qualitative Research Methodology in Social Sciences and Related Subjects. *Journal of Economic Development, Environment and People*, 7(1), 23-48. https://doi.org/10.26458/jedep.v7i1.571

Huan, S.H., Sheoran, S.K., & Wan, G. (2004). A review and analysis of supply chain operations reference (SCOR) model. *Supply Chain Management*, 9(1), 23-29. https://doi.org/10.1108/13598540410517557

Ismadhia, A.S., Ridwan, A.Y., & Hadi, R.M.E. (2018). Perancangan Model Pengukuran Kinerja Green Sales and Distribution Berbasis Model Scor pada Industri Penyamakan Kulit. *Jurnal Rekayasa Sistem Dan Industri (JRSI)*, 5(1), 1-7. https://doi.org/10.25124/jrsi.v5i01.302

Junior, F.R.L., & Carpinetti, L.C.R. (2016). Evaluating supply chain performance based on SCOR model and fuzzy-TOPSIS. *2016 IEEE International Conference on Fuzzy Systems (FUZZ)* (2075-2082). https://doi.org/10.1109/FUZZ-IEEE.2016.7737947

Kampa, A., Gołda, G., & Paprocka, I. (2017). Discrete Event Simulation Method as a Tool for Improvement of Manufacturing Systems. *Computers*, 6(10), 1-12. https://doi.org/10.3390/computers6010010

Karnon, J., Stahl, J., Brennan, A., Caro, J.J., Mar, J., & Möller, J. (2012). Modeling Using Discrete Event Simulation: A Report of the ISPOR-SMDM Modeling Good Research Practices Task Force-4. *Medical Decision Making*, 32, 701-711. https://doi.org/10.1177/0272989x12455462

Kersten, W., & Saeed, M.A. (2014). A SCOR Based Analysis Of Simulation In Supply Chain Management. *Proceedings 28th European Conference on Modelling and Simulation* (1-9). https://doi.org/10.7148/2014-0461

Kotzab, H., Teller, C., Grant, D.B., & Friis, A. (2015). Supply chain management resources, capabilities and execution. *Production Planning and Control*, 26(7), 525-542. https://doi.org/10.1080/09537287.2014.927932

Lestari, F., Ismail, K., Bakar, A., Hamid, A., & Sutupo, W. (2014). Measuring the Value-added of Oil Palm Products with Integrating SCOR Model and Discrete Event Simulation. *Research Journal of Applied Sciences, Engineering and Technology*, 8(10), 1244-1249. https://doi.org/10.19026/rjaset.8.1090

Ma, P., Wang, H., & Shang, J. (2013). Supply Chain Channel Strategies with Quality and Marketing Effort-dependent demand. *International Journal of Production Economics*, 144(2), 572-581. https://doi.org/10.1016/j.ijpe.2013.04.020

Mukhamedjanova, K.A. (2020). Concept of Supply Chain Management. *Journal of Critical Reviews*, 7(2), 759-766. https://doi.org/10.31838/jcr.07.02.139

Owida, A., Byrne, P.J., Heavey, C., Blake, P., & El-Kilany, K.S. (2016). A simulation based continuous improvement approach for manufacturing based field repair service contracting. *International Journal of Production Research*, 6458-6477. https://doi.org/10.1080/00207543.2016.1187774

Permata, E., Kusumanto, I., Papilo, P., Rosanda, N., & Asrol, M. (2018). Supply Chain Performance Analysis Of Oil Palm Biomass For Community Electricity In Indonesia. *International Journal of Advanced Research*, 6(6), 243-256. https://doi.org/10.21474/ijar01/7208

Persson, F., Bartoll, C., Ganovic, A., Lidberg, M., Nilsson, M., Wibaeus, J. et al. (2012). Supply Chain Dynamics In The Scor Model - A Simulation Modeling Approach. *Proceedings of the 2012 Winter Simulation Conference* (1-12). https://doi.org/10.1109/WSC.2012.6465030

Pirolo, J., Ray, A., Gadzinski, M., Manese, M., Garvert, B., Scoville, G. et al. (2009). Utilization of discrete event simulation in the prospective determination of optimal cardiovascular lab processes. *Proceedings - Winter Simulation Conference* (1916-1926). https://doi.org/10.1109/WSC.2009.5429208

Putro, P.A.W., Purwaningsih, E.K., Sensuse, D.I., Suryono, R.R., & Kautsarina (2022). Model and implementation of rice supply chain management: A literature review. *Procedia Computer Science*, 197(2021), 453-460. https://doi.org/10.1016/j.procs.2021.12.161

Rachman, N.M., Cahyadi, E.R., & Hardjomidjojo, H. (2017). Biaya Transaksi Dan Nilai Tambah Pada Rantai Pasok Daging Sapi Di Kota Bogor. *Jurnal Manajemen Dan Agribisnis*, 14(1), 22-31. https://doi.org/10.17358/jma.14.1.22

Rapika, R., Zulfikar, Z., & Zumarni, Z. (2016). Kualitas Fisik Gelatin Hasil Ekstraksi Kulit Sapi Dengan Lama Perendaman Dan Konsentrasi Asam Klorida (Hcl) Yang Berbed. *Jurnal Peternakan*, 13(1), 26-32. https://doi.org/10.24014/jupet.v13i1.2386

Saputra, H., Nazir, N., & Yenrina, R. (2018). Fair Value-Added to Gambier Supply Chain Actors in West Sumatra. *Jurnal Teknologi Dan Manajemen Agroindustri*, 7(3), 170-180. https://doi.org/10.21776/ub.industria.2018.007.03.5

Shashi., Singh, R., & Shabani, A. (2016). Value-Adding Practices in Food Supply Chain: Evidence from Indian Food Industry. *Agribusiness An International Journal*, *33*(1), 1-15. https://doi.org/10.1002/agr.21478

Sasmitaloka, K.S., Miskiyah, & Juniawati (2017). Kajian Potensi Kulit Sapi sebagai Bahan Dasar Produksi Gelatin Halal. *Buletin Peternakan*, 41(3), 328-337. https://doi.org/10.21059/buletinpeternak.v41i3.17872

Simpson, P.M., Siguaw, J.A., & White, S.C. (2002). Measuring the Performance of Suppliers: An Analysis of. *Journal of Supply Chain Management*, 29-41. https://doi.org/10.1111/j.1745-493X.2002.tb00118.x

Xia, Y., Xiao, T., & Peter-Zhang, G. (2019). Service investment and channel structure decisions in competing supply chains. *Service Science*, 11(1), 57-74. https://doi.org/10.1287/serv.2018.0235

Xing, W., Zou, J., & Liu, T.L. (2017). Integrated or decentralized: An analysis of channel structure for green products. *Computers and Industrial Engineering*, 112, 20-34. https://doi.org/10.1016/j.cie.2017.08.013

Yang, D., Wang, J., & Song, D. (2020). Channel Structure Strategies of Supply Chains with Varying Green Cost and Governmental Interventions. *Sustainability (Switzerland)*, 12(1), 1-26. https://doi.org/10.3390/SU12010113