SINERGI Vol. 25, No. 3, October 2021: 269-278
http://publikasi.mercubuana.ac.id/index.php/sinergi
http://doi.org/10.22441/sinergi.2021.3.004

OPTIMIZATION OF STAPLE PRODUCTS USING THE SUPPLY CHAIN OPERATION REFERENCE (SCOR) TO CUSTOMER SATISFACTION IN CENTRAL JAVA

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Abstract
The role of the Supply Chain affects the value of domestic products that arise in an area is not the same as the income received by residents of the area. It can be seen that the staple products sector dominates 61.55% of the distribution of products in Central Java. So, this is an important factor in measuring the Supply Operations Chain that occurs in these commodities. The high costs incurred in this sector encourage us to continue to improve our operational performance to reduce costs as low as possible. The condition is what the public/consumers want so that the gap between production costs and distribution costs of existing products is not too far away. This study aims to measure consumer satisfaction with the Supply Chain in the area and optimize the Supply Chain model that can be done to improve operational processes in the upstream (supplier) and downstream (distribution channels) of the Supply Chain in Central Java. The data analysis method used is the Supply Chain Operation Reference (SCOR). This model serves to weigh the importance of measuring customer satisfaction with the Supply Chain in the area, and efforts to improve operational performance can be made by minimizing failure in the process so that delivery to consumers is on time. The results of the SCOR model show that Asset, Agility, and Cost are variables that must be improved in the logistics process in Central Java.

Keywords:
Customer Satisfaction;
Supply Chain Operation Reference (SCOR);
Supply Chain;

Article History:
Received: October 8, 2020
Revised: December 17, 2020
Accepted: January 18, 2021
Published: July 30, 2021

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INTRODUCTION

Based on Indonesian economic data in the last three years, Indonesian logistics sector projections will grow by 12.73% in 2020 with a Gross domestic product (GDP) of 993.9 trillion. Indonesia's logistics sector in 2019 was worth 881.66 trillion, which means an increase of 10.51% from the previous year. The growth rate was higher than the last year of 8.52% [1][2]]. The increasing growth rate of the logistics sector from year to year and the ever-ongoing problems encourage us as industry players to continue improving performance, especially in the Supply Chain sector, to meet customer expectations with the right amount and time [3][4].

From Statistics Indonesia (BPS) the data of Central Java Gross Regional Domestic Product (PDRB) distribution in the period 2010 - 2019, the role of the Supply Chain affects the value of domestic products arising in an area is not the same as the income received by the area's residents. Commodity staple products sector in Central Java. 61.55% of PDRB distributions are Household Health Supplies dominated (household consumption expenditure) or Staple Products, an essential factor in measuring Supply Chain operations in this staple products commodity [5].

In Central Java, especially in basic needs Supply Chain operations, price fluctuations in the distribution increased due to several factors'

traders providing logistics storage warehouse.

The high cost incurred in this sector encourages us to continue to improve our operational performance to reduce the price as low as possible. This high cost is certainly what the public/consumers want so that the gap between the cost of production and the cost of distribution of existing products is not too far away.

Other issues in Central Java related to the products distribution system, which the government should facilitate access to the markets of local food products, are healthy, formed in logistics systems. It is also to be supported by providing appropriate information networks up to the village level to facilitate access to market information and technologies relevant to local agricultural development needs. Also, it is essential to strengthening the warehousing network through the warehouse receipt system [3]. The distribution of products from A to B can be a real challenge in South and Southeast Asia. This region is still undeveloped due to geographical reasons (such as the difficulty of transportation between islands in Indonesia) or the lack of infrastructure [4]. Figure 1 and Figure 2 shows that the logistic cost in Indonesia is the highest in Asia regions. However, Indonesia's Logistic Performance Index value is still in the number 3 position from the bottom among ASEAN countries. Therefore, it is very contradictory where the higher price the national logistics should also index.

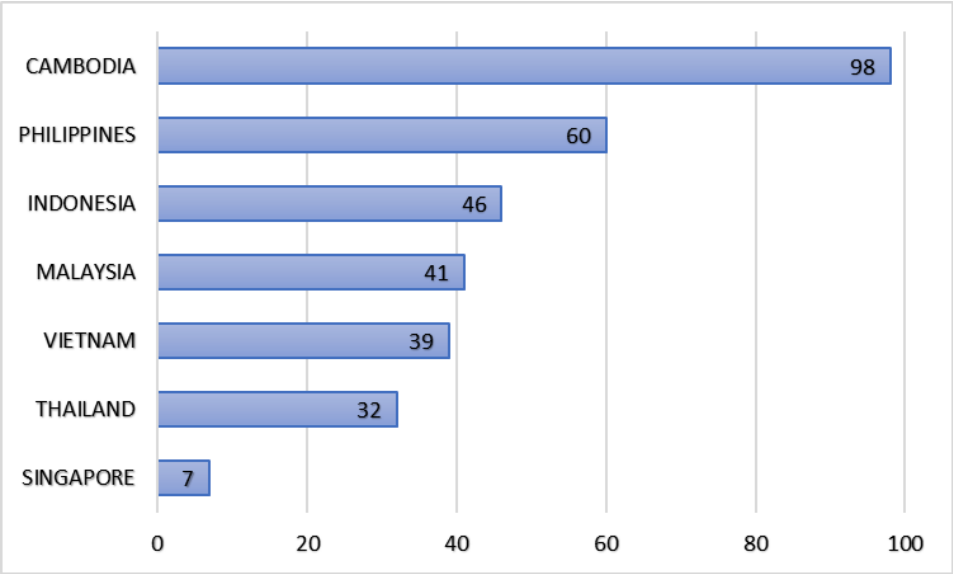

Figure 1. Ranking of ASEAN Countries in the Logistics Performance Index [5]

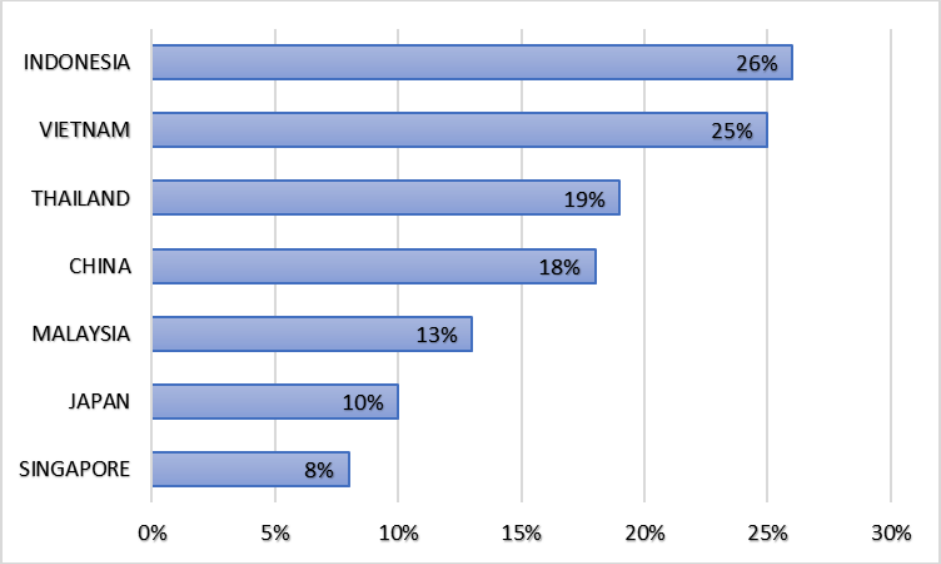

Figure 2. Logistics Costs OF GDP in regions [6]

METHOD

The Supply Chain Operation Reference (SCOR) method divides the Supply Chain process into five Plan processes, Make (production process), delivery (delivery process), Source (procurement process), and Return (return process) [6][7]. This method can identify, evaluate, and monitor Supply Chain performance using five aspects: reliability, responsiveness, flexibility, cost, and Assets [8][9]. This model SCOR is a framework supported and developed by the Supply Chain council that seeks to serve as a standard description of the relationships, processes, and metrics that define the management Supply Chain. The SCOR model consists of three levels that describe the Supply Chain process in more detail.

Views Level 1 structured SCM around five core management processes [10]: (1) Source; a process obtains services product to meet Plan or actual demand [11]. (2) Make; the process that turns the product into a finished state to meet the planned or actual demand [12]. (3) Deliver; that provides a finished product and services to meet actual demand or scheduled. This process includes order management logistics and also distribution activities. (4) Return; the process associated with returning or receiving the returned product [13]. (5) Plan; an approach that balances aggregate resources with requirements [11][14]. Level 2 of the SCOR model further divides SCM activity into so-called process types. The first is Plan. That process aligns expected resources to meet demand requirements, including sales and operation planning, parent schedules, and material planning [15][16]. The second is Execution. This process is trigger by requests for actual or planned changes in material products [17][18]. (3) Enable is a process that maintains, manages information, or prepares relationships based on the planning and implementation process. Finally, the activation process supports its primary value-added activity but is not directly involved in it [17].

The companies SCOR to measure processes Supply Chain and determine where weak identify possible improvements. The standard Supply Chain model as a -industry and guides SCOR is applying tools analytical to the Supply Chain on the primary process, best practice, and performance evaluation [19]. Performance the attributes are a group in metrics used to express strategies. The attribute itself can not be measured cause we can use it to set a strategic direction. Measure the ability of the metrics Supply Chain to achieve these attributes strategies is listed in Table 1 [17, 20, 21].

Table 1. Attribute SCOR Model [9]

Attribute	Definition
Reliability	The ability to perform tasks as we are expected. Reliability focuses on predictability process outcome, typical of reliability marries attribute: the right quantity and right quality, on-time.
Responsiveness	The speed at which tasks are performed. The focused speed at which a Supply Chain provides products to the customer.
Agility	Agility is the ability to respond to external influences. Respond to the ability of marketplace change to maintain competitive advantage. SCOR Agility matrices adaptability dan flexibility
Costs	The cost of operating Supply Chain processes includes material costs, labor costs, management, and transportation costs. A typical cost metrics Cost of Products Sold.
Assets	Ability to efficiently utilize assets. Asset management strategies in a Supply Chain include inventory reduction outsourcing versus in-sourcing. Metrics assets include capacity utilization and inventory days of supply.

Other research measures Supply Chain management performance to improve competitiveness [22][23]. The company is required to optimize production results to meet quality export standards. This research begins the creation of what the initial based on dimension Supply Chain management (SCM), namely Plan, Source, Make, Deliver, and Return SCM has a hierarchy based on Supply Chain Reference Operation, namely Responsiveness, Reliability, Agility, Cost, and Asset [12, 24, 25]. The indicators are a benchmark to identify Key Performance Indicators (KPI) in performance measurement while allowing normalization to equalize value KPI [11].

Other research outlines the effects of AM in the Supply Chain of aircraft parts. Three Supply Chain scenarios are presented and analyzed their performance about the necessary safety inventory. Under actor's consideration includes logistics lead time, manufacturing lead time, characteristic demand, and CSL. Demonstrated can change the conventional configuration of aircraft parts and Supply Chains to reduce safety inventory. These parts will be cutting inventory storage costs throughout the Supply Chain [14].

The distribution flow of products in the Central Java region is relatively uneven, especially for commodity Staple Products, thus causing scarcity of products in meeting the needs of consumers in Central Java. Supply chain productivity is optimized by optimizing the Supply Chain of products to better integrate upstream and downstream business processes. That is why we

need identification the Supply Chain indicator in Central Java.

This study is different from previous research. This study focuses on the Supply Chain flow of Staple Products in Central Java by measuring customer satisfaction with Supply Chain performance. Mapping is needed to be able to identify Supply Chain problems that occur.

Material

The government categorizes the following 14 commodities as a staple, namely: rice, soybean raw materials, Tempe, shallots, chilli, beef, sugar, cooking oil, wheat flour, chicken meat, chicken eggs, Milkfish, bloated fish, and cob fish [26]

Methods

In the data reduction phase, the researchers outlined field data from interviews, discussions, and observations obtained from sources at the research site. The next step is the data presentation, making it easier to see the overall picture or specific parts of the research focus. The last stage is to draw conclusions/ verification, which is carried out continuously during the study. For example, in measuring the data obtained by surveying a few samples, direct consumers who consume staple products in Central Java, such as household consumers, are 30.98%, traditional market players are 34.27%, and the retailer for distribution staple products with 34.74%.

Based on the Slovin data collection technique, data from the population of Central Java who are users of staple products, with the number of respondents accepted were 426 respondents, with a data uncertainty level of 5%.

RESULTS AND DISCUSSION

Staple products are the product consumed by the community. Therefore, the price of staple products sometimes increases and decreases. The increase in the price of staple products is due to the demand for products, but the supply is small (not enough demand). In contrast, the decrease in the price of staple products is due to the supply of any product (exceeding the demand), but the demand is small because it cannot be well distributed.

Mechanism of Product Flow, Information Flow, and Financial Flow

Mechanism of Product Flow, Information Flow, and Financial Flow in Commodity Supply Chain of household staple products in Central Java has two mechanisms.

Observations and references from other studies show that the flow of the Supply Chain of staple products in Central Java is distinguished into two kinds of channels that distribute, as depicted in Figure 3. In the first channel, the producer distributes staple products to the steamer. Next, the steamer distributes them to wholesalers, then the wholesalers sell them to retailers, and retailers sell them to consumers. In the second channel, manufacturers distribute staple products to large merchants, wholesalers sell them to retailers, and retailers sell them to consumers.

Supply Chain Operation Reference (SCOR)

Measuring relationships between variable indicators for each perspective in SCOR, the results of measuring the relationship between indicators can be seen in Figure 2. The path analysis process obtained measurement results against the indicators that make up the variables in the research model. The data processing results in the analysis path are shown in Figure 2. Data processing results using SPSS show some indicators have loading factor values below 0.7. From the results of the analysis path. The results are as shown in Figure 4.

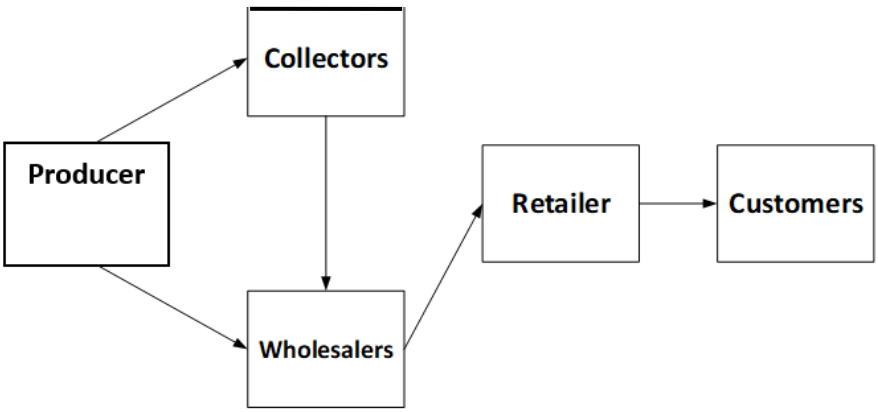

Figure 3. Mechanism Product Flow [29]

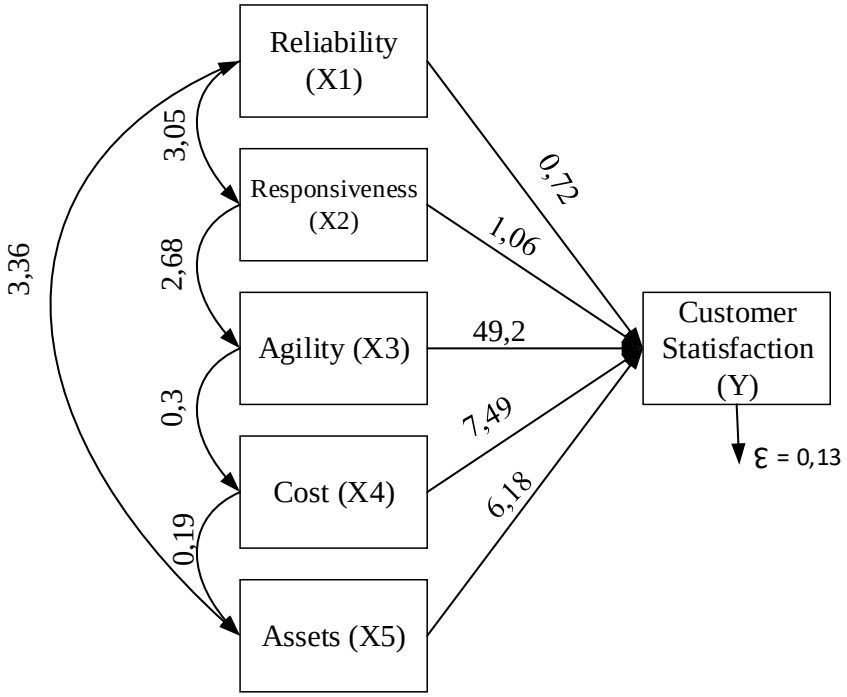

Figure 4. Relationship's variables

Based on the results and discussion with the path analysis, the following conclusions are obtained: (1) Variable relationships in the path analysis follow direct, indirect, and mixed relationship patterns. (2) Analyzed the path to the analysis of relationships between exogenous variables: Reliability (X1), responsiveness (X2), Agility (X3), Cost (X4), Assets (X5) with endogenous variables: Consumer satisfaction (Y). Then it can be known direct variable Reliability (X1) to consumer satisfaction of 0.72%, Responsiveness (X2) to consumer satisfaction of 1.06%, Agility (X3) to consumer satisfaction of 49.2%, Cost (X4) to consumer satisfaction of 7.49%, Assets (X5) to consumer satisfaction by 6.18%. Therefore, in the above results, we can say that the Agility factor (X3), Cost (X4), and Assets (X5) are valid values desired by consumers looking at the supplier availability factor, suitability of product costs, that has a high contribution according to the needs of consumers.

Optimization Plan of Supply Chain flow mechanism

It improved the supply chain mechanism of staple products. Based on the measurement of customer satisfaction against Supply Chain performance. In Figure 5, the agility metal is the dominant factor in customer problems on the product's availability; by building inter-regional connectivity which can support the availability of suppliers in distributing their products. It also must be supported by an infrastructure that can build connectivity in product distribution between regions to reduce costs in product distribution by the measured variable costs and assets. This is following the government's program to construct the Central Java Province regional distribution center [5].

Agility

There are several variables, such as follows.

1. Supplier Availability

Supplier availability is a fundamental problem in central Java's lack of supply of staple products, with a wide range of regions and uneven infrastructure triggering supplier limitations in dissolving their products. Therefore, we need the stimulation of new suppliers to support the development of Supply Chains in Central Java [30].

a) Distribution Facility
   Distribution activities require various facilities, such as depots and warehouses, consolidation centers, and distribution centers. Several things need to be considered, including determining the location, capacity, equipment, commodities to be handled, the areas to be served, and so on.
b) Infrastructure
   The smooth operation of road transportation

and distribution requires infrastructure support, such as roads, bridges, ports, and others. The availability of adequate road infrastructure strongly influences the transportation of products. Therefore, the government needs to pay attention to the road carrying capacity (length and width) of the increase in vehicle volume.

c) Hub-and-Spoke system
This system was developed by taking into all points of origin and destination of delivery of products. Delivery of products from one point to another is carried out using a point as a hub. This system can achieve efficiency through a lower frequency of delivery of products. In addition, fleet utilization rates are better on long-distance routes, the choice of fleet capacity on a path according to its volume [30].

2. The flexibility of Product Availability

The pattern of product allocation by manufacturers, such as products produced directly, is sold immediately and stored for later sale at times of high prices. This pattern is strongly related to each product's characteristics and intrinsic commodities that cannot keep for long without refrigeration equipment and manufacturers' limitations of storage equipment both individually and in groups.

The service system to be developed is a one-stop service system that will be managed by professional management with the following details [31]:

a) Purchase of Commodities
- Procurement of imported commodities as a buffer reserve
- Purchase of commodities in surplus areas as buffer reserves
- Quality inspection & certification

b) Transportation:
- Domestic or international delivery
- Load Unload commodities on a vehicle

c) Warehousing:
- Reception
- Docking
- Consolidation
- Sorting
- Shipping

d) Special Storage - Cold Storage
- Order Picking / Kitting
- Inspection
- Consolidation
- Packaging (Packing/ Crating)
- Shipping

Cost

1. Product cost deviation

This indicator comes from its location far from the main market destinations and inadequate physical and economic infrastructure conditions that are influenced by regional configuration and infrastructure conditions and the availability of means and infrastructure for transportation modes.

2. Competitiveness of product prices

The number of traders, especially large traders and large traders between regions, is still relatively limited. The harvest season leads to a market for a product or service that a few large buyers dominate. Producers in the Central Java production center tend to face oligopsony market structures that cause weak farmers' positions.

3. Suitability of product costs

The market structure faced by producers is very determined by the harvest season's conditions, the dynamics of market demand, and the number of traders operating.

Asset

The distribution of products to each indicator region is very lacking due to the lack of facilities and infrastructure for post-harvest handling and marketing. There has not been a market information system built between the production center area and between the production center area with a consumption center area.

Improving the above variables is expected to increase the Supply Chain flow to be even better, so suppliers' availability in several areas in Central Java can be available and increase the variants of product availability to meet customer needs even more. Prices of products can also be by the existing market, by pressing on product distribution cost to all regions in Central Java. One factor that must be improved in increasing suppliers' availability and minimizing distribution costs is the facilities for logistics or the product itself, either from warehouses or other infrastructure access.

A conceptual framework model is created to improve Supply Chain performance to increase customer satisfaction in the availability of staple products from the data processing results.

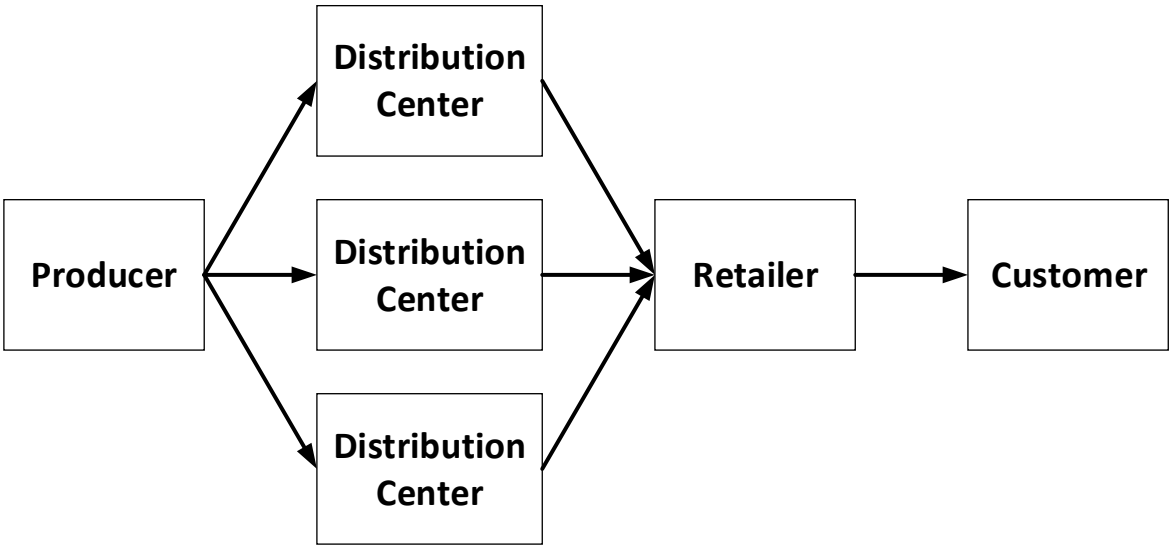

Figure 5. Supply Chain Model Planning Mechanism

The urgency of the Supply Chain flow mechanism for commodity products of staple products is based on the argument that so far, the linkages between subsystems in the network of product needs are generally still fragmented, making it difficult to compete in the market. This can be seen from the separate operationalization of upstream subsystems (raw materials) to downstream (marketing and processing results). The effects of the distribution system's weakness impact the scarcity of stocks and disparities in price simultaneously. Therefore, the distribution center is one of the strategic initiatives in the context of products logistics infrastructure. This distribution center serves as a buffer for the primary commodities in several districts and cities with population, Accessibility, and consumer areas, a collector in nature, and developed into trade centers.

The distribution center becomes a consolidation center in terms of commodity ordering when the booking quota in the regional distribution center (DC) requires insufficient order independently. The location of the distribution center meets these criteria:

a. The determining location of distribution centers by considering the volume of supply and demand for basic and strategic commodities and superior regional commodities in the area around the distribution center.
b. Determining the location of the distribution center needs to be done by considering the existence and carrying capacity of a seaport near the location of the distribution center.
c. Accessibility from/to distribution center locations needs to be supported by adequate land transportation infrastructure (road) in terms of road class and condition aspects.
d. The competence of human resources needs to be done immediately during the construction of the distribution center. Can expect that the distribution center can operate properly as soon as the distribution center construction is completed.
e. It is necessary to immediately socialize the existence of a distribution center to related parties, especially to potential partners, namely farmers, breeders and fishermen, and agencies in the relevant regional government.
f. Distribution center business and operational processes need to be well prepared and designed, including by developing an integrated Supply Chain with related parties.
g. The Central Government and Provincial Governments need to pay attention to the technical and administrative requirements that must be met so that the transfer of distribution centers can be carried out as soon as the distribution center construction is completed.

Following government regulations on this statement of support construction of DC in several regions of the logistic system development in products security in Central Java was included in the program 2019-2023 Regional Medium Term Development Plan (RPJMD) as listed in Table 2 [3].

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Table 2. Attribute SCOR Model Performance

Dimension	Indicator	Effectiveness	Efficiency
Reliability (X1)	Product supply availability	▲	
	Number of customers	▲	
	Quality of raw materials	▲	
	Service Level provided	▲	
	Customer purchase fulfillment		▲
	Accuracy of the number of products shipping	▲	
	Accuracy of the type of product shipping	▲	
	Product quality after the delivery process	▲	
	Number of complaints in product purchases	▲	
Responsiveness (X2)	Length of product availability period	▲	
	The length of the cost calculation period of the new product	▲	
	A time frame of responding to a complaint	▲	
	Reject product replacement period	▲	
Agility (X3)	Supplier availability	▲	
	Product availability flexibility	▲	
Cost (X4)	Product cost deviations		▲
	Product price competitiveness	▲	
	Suitability of product costs	▲	
Assets (X5)	Product distribution to each region		▲
Customer satisfaction (Y)	Quality of Service	▲	
	Facility		▲
	Booking Process	▲	

The main weakness in this Supply Chain structure is the inadequate facilities and infrastructure in Central Java and the flow of information from the system that regulates the movement of products with a very low value of 49.2% (not good) towards consumer satisfaction. This is also consistent with a report published [28], with the same problems in various regions in Indonesia, which have become an economic slowdown in the logistics sector. However, overall, it can resolve this problem, minimize logistic costs, and meet products availability in all regions.

CONCLUSION

The effect of Supply Chain operations reference (SCOR) on the Agility factor of 49.2%, Cost 7.49%, and Assets 6.18% has the most significant influence, meaning that must improve the factor in improving consumer satisfaction. The Supply Chain model designed to increase product distribution in Central Java by the research results created a distribution center point (Assets) to reduce cost and fulfillment of product supply (Agility). The Supply Chain model is designed according to the results of research looking at the needs of consumers. The design of product distribution is proposed through upstream to downstream based on the results of research between manufacturers and retailers until consumers have distribution center points to maintain product distribution flow and minimize product prices to consumers.

This research is a pioneer in optimizing Supply Chain staple products in Central Java by using the SCOR approach to support government programs in developing a logistics system for products security in Central Java, including the 2019-2023 Regional Medium Term Development Plan (RPJMD) program. In addition, these results can serve as academic support for developing a government logistics system, where the results of this design will be applied and reviewed in the following research to know the effective and efficient distribution points in the Central Java region.

ACKNOWLEDGMENT

Ministry of Research Technology and Higher Education supported this research funded by the Indonesian government (Nomor: 0111/D5/KP/LPPM/UNPAM/IV/2020). In addition, we thank our colleagues from Pamulang University, who provided insight and expertise that greatly assisted the research.

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