PERFORMANCE MEASUREMENT AND IMPROVEMENT OF SUPPLY CHAIN MANAGEMENT PERFORMANCE USING SCOR 12 METHOD AT PT. ABC (SINGARAJA UNIT) IN COVID-19 PANDEMICS

THESIS

Submitted to International Program
Department of Industrial Engineering
In Partial Fulfillment of the Requirements for the degree of
Sarjana Teknik Industri
Universitas Islam Indonesia



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YOGYAKARTA
2020

AUTHENTICITY STATEMENT

In the name of Allah ﷻ, I declare that this research is a work based on research that I did by myself except for the citation and summaries that have their sources listed. If in the future, this research is proven to violate the rules and intellectual property rights, I am willing to accept the sanctions by Universitas Islam Indonesia.

Yogyakarta, July 23th, 2020



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DEDICATION PAGE

I present this research to Allah ﷻ for all the grace and convenience bestowed on me, my beloved parents, and all my friends who always provide prayer, morale and motivation to complete this undergraduate thesis.

PREFACE

Assalamualaikum Wr.Wb.

Alhamdulillahisyukur, all of the gratitude are said to the presence of Allah ﷻ who has bestowed His grace and hidayah to all of us, especially the author so that the undergraduate thesis entitled "Performance Measurement And Improvement Of Supply Chain Management Performance Using SCOR 12 Method at PT. ABC (Singaraja Unit) In Covid-19 Pandemics" can be completed properly. We also give greetings to our Prophet Muhammad ﷺ, who has brought us from the darkness to the bright light of Islam.

In completing the undergraduate thesis, the author faces a lot of difficulties. However, the help of prayers, ideas, reference to thinking endlessly given by the supervisor, lecturers, and friends to solve problems that arise. Therefore, the author would like to thank the parties who helped in the completion of this report, namely:

1. Dr. Ir. Elisa Kusrini, MT, CPIM, CSCP., as the supervisor who provides me the way in the time of confusion and bestows our knowledge to complete this undergraduate thesis.
2. Mr. Abdullah Azzam, S.T., M.T., who helps me to complete memorize of Juzz amma.
3. Ms. Tia Atika Putri, S.T., which helps in completing the understanding of the theory in this undergraduate thesis.
4. All of my lecturers, classmates, friends and IP Department who always support me till this day.

May God repay all the good they did with grace and additional guidance so that they can receive goodness for all of us.

The author realizes that in doing this undergraduate thesis, there are many shortcomings and weaknesses in terms of material and technical aspects. Therefore, the author apologizes and expects criticism and suggestions for the perfection of this undergraduate thesis. The author hopes that this apprenticeship report can be useful for many parties. May goodness always be with you, and may sadness pass from you. Finally, the author says thank you.

Wassalamu'alaikum Warohmatullahi Wabarakatuh

Yogyakarta, July 23th, 2020

Andi Teguh Hermawan

MOTTO

So do not weaken and do not grieve, and you will be superior if you are [true] believers.

(Ali 'Imran : 139)

Allah will raise those who have believed among you and those who were given knowledge by degrees. Furthermore, Allah is Acquainted with what you do.

(Al Mujadilah : 11)

Whoever follows a path in pursuit of knowledge, Allah will make easy for him a path to paradise

(HR. Tirmidzi)

ABSTRACT

Competition in the competitive industry sector resulted in each company competes to develop and design the best system to maintain its position in the global market. Every company strives to meet customer needs by continually making improvements to their supply chain management systems. However, a recent outbreak of the Covid-19 pandemic appeared and disrupted the stability of the Indonesian economy. All sectors are disrupted due to various PSBB policies undertaken by the government in handling the Covid-19 pandemic. PT. ABC (Singaraja unit) is a company engaged in the Poultry farm industry in the city of Singaraja. The government's PSBB policy causes problems at PT. ABC (Singaraja unit) supply chain, such as the decrease in demand for broiler chicken products and the failure of forecasting the raw material and product demand. This problem results in a change in the number of DOC (Day Old Chick) raw material orders to suppliers due to unstable product demand, which is likely to cause losses, so it is necessary to measure performance to determine the performance of the company's supply chain and create a strategy to increase sales during the Covid-19 pandemic. The method used to measure company performance is SCOR 12 and Snorm de Boer normalization. In addition, Voice of Customer and SWOT analysis method are used to determine the customer needs as a reference for company to create strategy to increase sales of product. Based on the results of performance measurements and SWOT analysis, supply chain performance scores at PT. ABC (Singaraja unit) is 84.52, where this score included in the good category. However, there are metrics that obtain unsatisfactory scores so that they need to be fixed, namely RL 3.37 Forecast Accuracy, RL. 3.49 Schedule Achievement, A.M 3.9 Capacity Utilization, and sE2 Manage Supply Chain Performance. Meanwhile, the strategy that can be used by companies to increase sales is the SO strategy, in which the company can create carcass chicken products that have many variations by prioritizing quality, hygiene, online sales, and delivery service.

Keywords: Supply Chain Management, Voice of Customer, Covid-19, Performance Measurement, SCOR 12, SWOT Analysis.

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CHAPTER I

INTRODUCTION

1.1 Study Background

In the modern era, the development of technological systems and economic flows are going very fast. Businesses are required to be active and dynamic in order to survive in the current global economy. Every business organization is expected to adapt by increasing the work performance they have as an increasing number of competitors in the business world. Besides that, business organizations need to implement competitive advantage strategies in order to have a position in the global market. The competitive advantage strategy can make a business organization maintains its competitive position against existing competitors (Porter, 2008).

Competition in competitive global markets, product introduction with short life cycles, and high customer expectations for available products and services require every company and other businesses to focus on the supply chain (Simch-Levi et al., 2003). According to Omoruyi & Mafini (2016), Supply chain management is an approach to streamline the integration of suppliers, manufactures, warehouses and storage with the aim that each product should be produced and distributed in the right amount, location and time to minimize costs and maximize profits for the company. Functional integration in every element of the supply chain will determine the company's success in surpassing the current competitive global market. Successful companies come from the company's management process in creating products with good quality, low prices, and faster processes than the competitor's strategic processes. (Djoko & Meirani, 2014).

Implementing a superior supply chain strategy in each company has its challenges. Moreover, the world is currently facing a pandemic coronavirus outbreak that is disrupting the global supply chain and stability of the world economy, both large businesses and small businesses. The International Monetary Fund has stated that the coronavirus, which is plaguing nearly the whole world, causing a global economic and financial. Data on world economic growth projections are given in Figure 1.1 below.

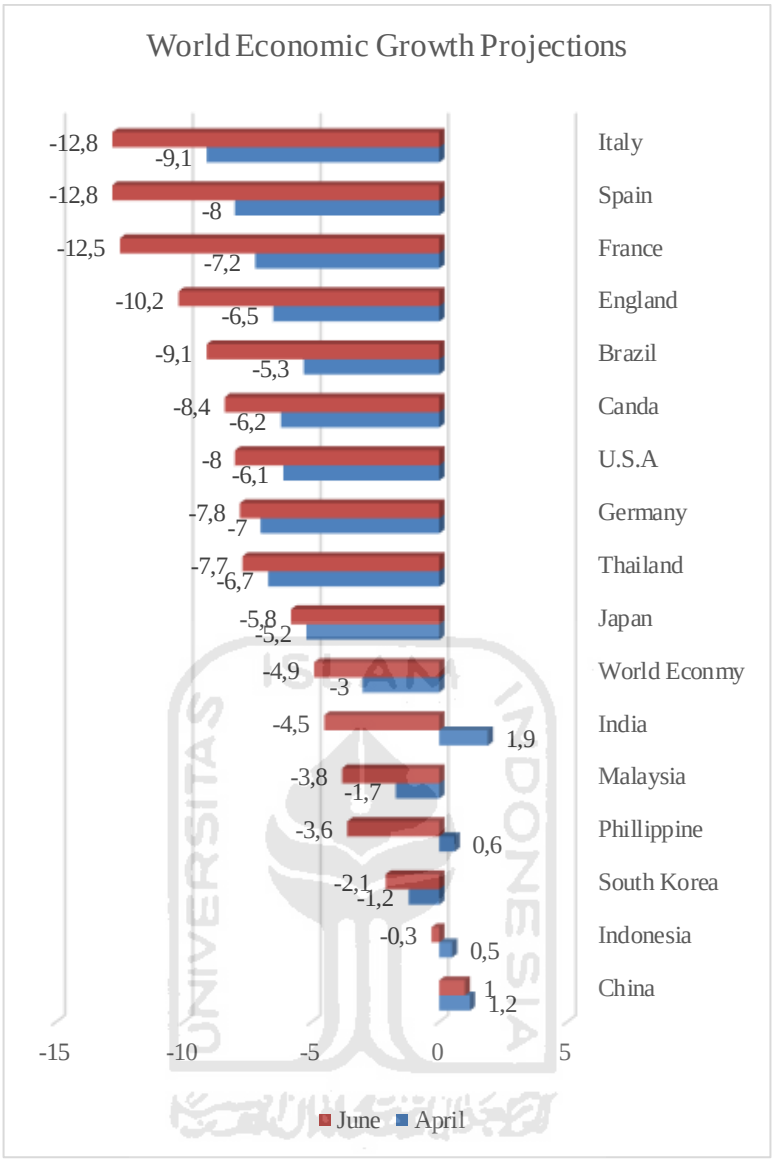


Figure 1.1 Economic Growth Projections

Source: International Monetary Fund (IMF), June 2020

The IMF stated that the negative impact of the Covid-19 pandemic was higher than expected, as evidenced by the shrinking world economy of -3% in April to -4.9% in June. The shrinking of global economy is caused by the lockdown policy of each country affected by Covid-19 as one of its efforts to stop the spread of the coronavirus. Indonesia also took steps to stop the spread of the coronavirus through the PSBB policy issued by the Minister of Health through PERMENKES No. 9 of 2020 regulating the Large-Scale Social Restrictions (PSBB) in order to accelerate the handling of Covid-19. The PSBB policy causes the consolation of schools and workplaces, restrictions on religious activities, restrictions on activities in public places or facilities, socio-cultural

restrictions, and restrictions on modes of transportation. However, the PSBB policy had a direct impact on Indonesia's economic downturn because the PSBB policy resulted in a drastic decrease in purchasing power and consumption. Figure 1.2 below is a projection of world economic growth in the second quarter of the world.

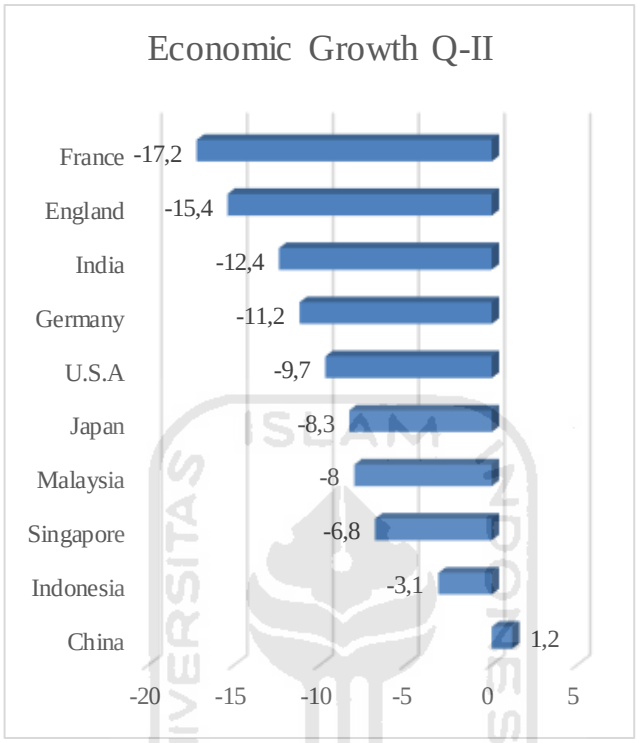


Figure 1.2 Economic Growth Q-II

Source: Bloomberg, June 2020

Data on economic growth projections show that Indonesia's economy in the second quarter dropped to -3.1%. This economic downturn is a continuation of the decline in the Indonesian economy in the first quarter, which was only 2.97%. According to Minister of Finance Sri Mulyani (2020), the cause of Indonesia's economic downturn was the PSBB's policy in dealing with the spread of the coronavirus. As a result, people's purchasing power and consumption have drastically declined so that the economic wheels are not running.

One of the companies affected by the economic downturn and PSBB policy is PT. ABC. PT. ABC is a subsidiary of one of the largest agri-food companies in Indonesia engaged in the business of poultry farms. The company implements a plasma core company system and partners with poultry farms in each region to produce broiler

chickens to meet the needs of chicken meat throughout Indonesia. PT. ABC has hundreds of work units spread across Indonesia, one of their units is located in the city of Singaraja, Buleleng regency, Bali. PT. ABC (Singaraja unit) supplies chicken to almost all areas of Buleleng regency through the traditional market, culinary industry and hotel. However, the implementation of PSBB in Bali had an impact on the closure of the culinary and hotel industry sectors. The following is a closed hotel data in Bali.



Figure 1.3 Closed Hotel in Bali

Source: PHRI (Indonesian Hotel and Restaurant Association), April 2020

The picture above shows that the highest hotel closure rate is in the Regency of Buleleng with a total of 89 hotels. In addition to the closure of the hotel and culinary industry sector, the limited market hours of operations and religious activities in Bali which are repetitive consumers of broiler chicken products add to the decline in product demand.

A drastic change in the market demand causes the disruption of company's supply chain due to unbalanced product supply and demand. During the pandemic, the company faced problems in forecasting raw material planning and forecasting product demand which always experienced significant gaps with real data. This problem affects changes in the number of DOC (Day Old Chick) raw material orders to suppliers due to unstable product demand.

Economic and market trends are changes during the Covid-19 pandemic that require companies to evaluate and improve the company's supply chain performance in

order to maintain the company's position in the midst of a pandemic. Evaluation of the supply chain system at PT. ABC (Singaraja unit) as a whole aims to enable the company to know the condition of the supply chain and make improvements in any supply chain processes that are not optimal. Therefore, companies need to carry out calculations for supply chain performance. The performance measurement has an important role in providing direction for future improvement, monitoring and controlling, and analyzing the position of an organization against competitors and the objectives to be achieved. According to Maulidiya (2014), performance measurement aims to reduce costs, meet customer satisfaction, increase profits, and evaluate the extent to which the company's supply chain performance has been achieved.

The purpose of this study is to analyze the performance of the supply chain management of PT. ABC (Singaraja unit) with the SCOR 12 (Supply Chain Operations Reference) model approach and provides alternative solutions to problems in evaluating the performance of supply chain in the form of proposals to improve the performance of supply chain management, so that the company gets a point of view and a foundation for improvement and the it can compete with other companies. Companies that can carry out effective supply chain activities will benefit not only in the short term, but also in the long term, such as increased profits from prolonged cooperation with various parties, cost efficiency, expansion of market share and customer satisfaction.

According to Robertson (2002), performance measurement is the process of evaluating work progress against predetermined goals and objectives, including the efficient use of resources in producing goods and services, the quality of goods and services produced, the results of activities compared to the intended intentions, and the effectiveness of actions in achieving goals. Based on this, performance measurement and improvement of the company's supply chain performance is essential to be done to find out and evaluate the extent of the performance of the supply chain system.

One method that used as a reference of the Supply Chain Council to measure a company's supply chain performance is the SCOR (Supply Chain Operation Reference) method. SCOR is a method of measuring internal and external supply chain performance in a company using the company's actual data. It involves three management elements, including, business process reengineering, benchmarking, and process measurement into the existing supply chain framework and then breaking down every process in the

metric (Ayu & Yandra, 2011). Measurement of supply chain performance using this method is very suitable so that evaluation can be carried out to proceed to the stage of improving supply chain performance.

1.2 Problem Formulation

Based on the background description above, a drastic change in market demand causes the disruption of company's supply chain due to unbalanced product supply and demand and issues a problem in forecasting raw materials and forecasting product demand that experiences significant gaps with real data on the market. Measurement of supply chain performance needs to be conducted to determine the cause of the problem, so that the company can improve supply chain performance on each production processes and develop appropriate business strategies to avoid losses during the Covid-19 pandemic. Based on the description above, the formulation of the main problems is:

1. How is the analysis of supply chain management performance at PT. ABC (Singaraja unit)?
2. What recommendations do companies need to improve the performance of the company's supply chain?
3. How the strategy to increase sales volume at PT. ABC (Singaraja unit)?

1.3 Problem Limitation

In this research, there are several limitations problems implemented to focus the observation as planned, which are:

1. Research only covers supply chain systems and marketing strategy in companies.
2. Research is based on the company's actual sales and production data.
3. The method used is SCOR 12 (Supply Chain Operation Reference) and SWOT analysis.
4. The determination of KPI (Key Performance Indicator) will be adjusted to the company policy.

1.4 Objective

The Objectives of the research are:

1. Determine the analysis of performance measurement of supply chain management PT. ABC (Singaraja unit).

2. Provide recommendations to improve the performance of the company's supply chain process.
3. Determine the strategy to increase sales volume at PT. ABC (Singaraja unit).

1.5 Benefits of Research

This research will provide benefits for students and companies, including:

1. For Students
    a. Students are able to implement the knowledge and skill of industrial engineering in realistically.
    b. Students are able to gain a clear understanding of the company supply chain business process as a whole.
    c. Students are able to gain experience in working in a company, making it easier for them to practice their skills in decision making and judgment.
    d. Build the character of professionalism, critical thinking, and responsibilities in the work-life.
    e. Measure the abilities and skills possessed.
    f. As a comparison between theory in lectures and practice in real situations
2. For the Company
    a. All methods applied can be proposed for making decisions on measuring and improving the performance of the company's supply chain, and as a reference for increasing sales volume in Covid-19 pandemic.
    b. Students could give a different perspective of problems that occurred in the company.
    c. The company could apply the suggestions from student for better company management.

1.6 Systematics Writing

The Undergraduate Thesis report is compiled systematically in the form of chapters consisting of:

Table 1.1 Systematics Writing

CHAPTER I	**INTRODUCTION**
	This chapter contains the study background, problem formulation, problem limitation, research objectives, research benefits and systematic writing of the Undergraduate Thesis report
CHAPTER II	**LITERATURE REVIEW**
	This chapter contains a study of deductive and inductive literature as a support for research.
CHAPTER III	**METHODOLOGY**
	This chapter explains how this research will be carried out, the data that will be used in the study, the research variables and the research flowchart to be carried out
CHAPTER IV	**DATA COLLECTION AND PROCESSING**
	This chapter will describe the process of collecting and processing data with a particular method, including pictures and graphics obtained from the results of the study
CHAPTER V	**DISCUSSION**
	This chapter will contain a critical discussion of the results of data processing. The results obtained will be the basis for decision making and improvement proposals
CHAPTER VI	**CONCLUSION**
	This chapter will discuss the conclusions of the research and answer the problem formulation. It is coupled with

recommendations for improvement and development for the company and subsequent research.

REFERENCE

CHAPTER II

LITERATURE REVIEW

2.1 Inductive Study

An inductive study is a study that discusses previous research to help determining the direction of research. Below is a table of previous studies regarding to performance measurement in supply chain systems. Based on the table below, it will be identified the difference between previous research and the current research that will be conducted. Table 2.1 below is the previous research data.

Table 2.1 Inductive Study

No	Title	Author (Year)	Method	Result
1	A decision-making model based on fuzzy inference to predict the impact of SCOR indicators on customer perceived value	Lucas Gabriel Zanon, Rafael Ferro Munhoz A., Lucas Daniel D. R. C., and Luiz Cesar R. C.(2019)	Fuzzy & SCOR	The article proposes a decision-making model based on fuzzy inference to help predicting the impact on CPV of the performance indicators of the SCOR® (Supply Chain Operations Reference) model. The SCOR® level 1 indicators were applied as a mean to assess CPV in a multidimensional way, to enable benchmarking with other supply chains and to facilitate the communication with stakeholders.
2	Predicting supply chain performance based on SCOR metrics and multilayer perceptron neural networks	Fransisco Rodrigues Lima-Junior and Luiz Cesar Ribeiro Carpinetti (2019)	SCOR, ANN	The results of computational implementation show that the use of hyperbolic tangent functions produces the best results in most models. The results also show that the number of hidden layer neurons lower than the number of input variables seems more appropriate

No	Title	Author (Year)	Method	Result
3	Combining SCOR® model and fuzzy TOPSIS for supplier evaluation and management	Fransisco Rodrigues Lima-Junior and Luiz Cesar Carpinetti (2016)	SCOR, Fuzzy TOPSIS	Decision-makers confirm the benefits of grouping suppliers in the performance category, so they can propose actions for supplier development
4	A systematic literature review of the supply chain operations reference (SCOR) model application with special attention to environmental issues	E. N. Ntabe, L. LeBel, A. D Munson and L. A. Santa-Eulalia (2015)	SCOR	Analysis of shipping activities for the manufacturer's MakeTo-Order strategy found that customer orders, payment schedules, products, shipping documentation, product acceptance, and verification are key performance metrics.
5	Kinerja Rantai Pasok Dengan Menggunakan Pendekatan Metode Supply Chain Operation Reference (SCOR)	Arief Rakhman, Machfud, and Yandra Yarkeman (2018)	SCOR	Supply chain structure in PT. XYZ is categorized as an extended supply chain, which is an ideal supply chain structure for companies with short-term partnerships. Supply chain actors at PT. XYZ consists of suppliers, subcontracted materials, PT. XYZ, subcontracting services, OEM customers, simplified customers, export customers, and after market customers. Supply chain actors PT. XYZ has been running its supply chain activities to support the activities. Choosing subcontract strategies for supporting processes is considered very good in minimizing the cost burden.
6	Pengukuran Kinerja Rantai Pasok Dengan Model Supply Chain Operations Reference (SCOR) dan Metode Perbandingan Berpasangan	David Try Liputra, Santoso, and Nadya Ariella Susanto (2018)	SCOR	The results obtained from this study are that the metric performance attributes that have the highest priority are made, reliability attributes, and MR-1 sub-criteria (conformity to product specifications). Overall, the current performance of the company's

No	Title	Author (Year)	Method	Result
				supply chain is included in the "good" category
7	A SCOR Based Approach for Measuring a Benchmarkable Supply Chain Performance	Batuhan Kocaoˇglu (2010)	SCOR, AHP, TOPSIS	In this study, SCOR is used to link strategic objectives with metrics. AHP is used for metric hierarchy analysis and determining weight. TOPSIS is used to normalize metric values
8	The impact of additive manufacturing in the aircraft spare parts supply chain: supply chain operation reference (scor) model-based analysis	Peng Liu, Samuel H. Huang, Abhiram Mokasdar, Heng Zhou and Liang Hou (2013)	Additive Manufacturing, SCOR	AM has the potential to change the conventional configuration of aircraft parts supply chains to achieve a reduction in safety inventory; thereby cutting inventory storage costs across the supply chain of strategic objectives by metrics. AHP is used for metric hierarchy analysis and determining weight. TOPSIS is used to normalize metric values
9	PENGUKURAN DAN PENINGKATAN PERFORMANSI SUPPLY CHAIN DENGAN PENDEKATAN MODEL SCOR DAN LEAN SIX SIGMA DI PT. GUNAWAN DIANJAYA STEEL, SURABAYA	Ari Primantara and Hari Supriyanto (2011)	SCOR, Lean Six Sigma	From the results of the study, three critical indicators SCOR model who became the focus of improvement with Lean Six Sigma is the inventory days of supply (supply chain assets), the make cycle time (responsiveness) and on-time delivery (reliability). Waste critical indicators contained in the inventory days of supply inventory slab while the waste is critical to make the indicators and on time delivery cycle time is waiting, not utilizing employee knowledge, skills and Abilities, excess inventory and transportation. Improvement based on the highest value on each improvement alternative. It was found that improvements in slab inventory conducted by the slab price forecast next year, improvements in indicators of the make cycle time, and on time delivery time is made by determining

No	Title	Author (Year)	Method	Result
				the optimal preventive maintenance intervals on the work roll and backup roll hydraulic and training about the quality and specifications to the carrier plate inspection. Improvements made to reduce production lead time by 15% and inventory reductions of 10% slab.
10	Pengukuran Kinerja Supply Chain dengan pendekatan Lean Six Sigma Supply Chain Management di PT. ALX Logistics	Asep Ridwan, Kulsum and Siti Murni (2017)	SCOR , Lean Six Sigma	Based on the results of the study that the critical indicator is Perfect Order Fulfillment with a large percentage gap of 14.37% of the target value. Waste that most influences are a backlog of work where the determination of waste is based on the weight and frequency of its occurrence. The next step is to identify the root causes of the backlog of work, which causes Perfect Order Fulfilment to become a critical indicator. Proposed improvements given are renewing the company's fleet management system, retraining employees and strengthening motivation through reward and recognition programs, continuous monitoring of KPIs and providing economical limits based on simulation results

The advantage of this research is the usage of SCOR 12 performance measurement method. The SCOR 12 method is the latest version which has an update on several metrics from the previous SCOR 11 version, so the hierarchy will be more detailed and produce an appropriate analysis. In addition, this study discusses the analysis of marketing strategies during the Covid-19 pandemic to increase sales demand. This additional marketing strategy analysis is a differentiating factor from previous research. The results

obtained from this study will be used as a reference for companies to solve the problem in Covid-19 pandemic.

2.2 Deductive Study

Deductive Study explains the theoretical basis and methods that will be used in this research. This study uses the theory of Supply Chain Management, Performance Measurement, SCOR 12 (Supply Chain Operation Reference), and Snorm De Boer Normalization.

2.2.1 Supply Chain Management

The supply chain is a network of cooperation among companies in creating and distributing products from the beginning to the end-user (Wirdianto & Unbersa, 2008). Meanwhile, according to Chopra & Meindl (2007), supply chain is a unit that is directly or indirectly involved in meeting the needs of customers such as suppliers, producers, distributors, transporters, inventory, retailers and even the end customers themselves. Available supply chains need to be appropriately managed using a supply chain management approach. This management aims to integrate every element of the supply chain so that an effective system is found in meeting customer needs and obtaining large profits.

Based on APICS Dictionary 14th edition (2015), Supply chain management is a design, planning, implementation, control to the observation of supply chain activities with the aim of building networks and infrastructure that are competitive and valuable, increasing global logistics power, meeting demand and measuring global performance. Meanwhile, according to Indrajit & Djokopranoto (2002), the definition of a supply chain is a system that becomes an organizational container for delivering production goods and services to customers. This system takes the form of a network chain of various organizations related to the same goal of providing the best procurement and distribution of goods for customers. Based on these definitions, it can be interpreted that supply chain management is an essential strategy in building a competitive advantage within a company. Every company manager is expected to be able to carry out planning, implementation, control, supervision, to risk management of the supply chain (Zaroni, 2015). It aims to create a competitive supply chain system in the global market.

There are three component elements that make up the supply chain:

1. Upstream Supply Chain

   Upstream Supply Chain is an upstream activity of a supply chain that has the main activity of procurement covering the activities of manufacturing companies with their suppliers (manufactures, assemblers, or both) and their connections to their suppliers.
2. Internal Supply Chain

   Internal Supply Chain is all inhouse processes used in transforming inputs (raw materials) from suppliers into a product output from the company. Its activities include production and manufacturing.
3. Downstream Supply Chain

   Downstream Supply Chain includes various activities that involve shipping products to end customers. Downstream Supply Chain has activities including distribution, transportation and after-sale services.

The benefits of implementing Supply Chain Management in companies according to APICS (2015) are,

1. Improve marketing capabilities
2. Increase speed, awareness and reduce variability in the flow of goods and services, costs and information
3. Efficient system operation
4. Improve risk management
5. Improve sustainability

In addition, according to Jebarus (2001) in Widyarto (2012), the application of the supply chain concept will provide many benefits including,

1. Customer Satisfaction

   Consumer or product users are the main target of the production process activities of each product. The consumers or users referred in this context are undoubtedly loyal consumers in the long run. To make consumers loyal, consumers must first be satisfied with the services delivered by the company.

2. Increase Revenue

   More loyal customers and partners with the company will also contribute to increasing company revenue, so the products produced by the company will not be 'wasted' useless, because consumers are interested to buy the product.

3. Reduce Cost

   Integrating product flow from the company to the final customer also means reducing costs on the distribution channel.

4. The Higher Utilization of Assets

   Assets, especially human factors, will be increasingly trained and skilled both in terms of knowledge and skills. Human resources will be able to empower the use of high technology as demanded in the implementation of Supply Chain Management.

5. Profit Increase

   The increasing number of loyal consumers and users of the product will increase the company's profit.

6. The Company is Getting Bigger

   Companies that obtain benefit from the product distribution process will gradually become larger and grow stronger.

2.2.2 The Measurement of Supply Chain Performance

Measurement of supply chain performance is essential for every organization or company. Performance measurement will provide results in the form of the current conditions of the company's supply chain process. The results obtained will be evaluated to find out whether system performance has increased or decreased performance. Based on these results, it is easy for companies to make improvements decisions and improve the performance of the system.

According to Calongesi (1995) in Wulan (2007), measurement is the process of collecting data by making empirical observations in order to obtain sufficient and relevant data to obtain an existing goal. The importance of measuring performance:

1. Performance measurement and evaluation can control performance both directly and indirectly

2. Performance appraisal will keep the company on track to achieve the objectives of the increasing supply chain.
3. Performance measurement and evaluation can be used to improve supply chain performance.
4. Incorrect methods of measurement and assessment can cause supply chain performance to decline.
5. The supply chain can be directed after performance evaluation is carried out.

But in measuring the performance of the supply chain system, companies need to pay attention to aspects of financial and non-financial aspects. According to Shah & Nitin (2001), developing a performance measurement system for both financial and non-financial aspects requires more in-depth consideration. Financial aspects will provide benefits in making strategic decisions and making reports, but it would be nice if the control of manufacturing and distribution operations are carried out using non-financial aspects so as to save on company expenses.

2.2.3 SCOR 12 (Supply Chain Operation Reference)

The Supply Chain Council (SCC) is a not-for-profit corporation of sixty-nine companies and individuals and in 1996 adopted the SCOR (Supply Chain Operation Reference) method as a standard framework for every company.

The SCOR (Supply Chain Operation Reference) model is used by many companies to conduct independent assessments and to compare supply chain activities and performance as a separate supply chain management standard for companies. According to Paul (2014), SCOR (Supply Chain Operation Reference) is used to understand the role of supply chains in operating, identifying and analyzing supply chain performance and crucial decision-making strategies. SCOR (Supply Chain Operation Reference) provides a business process framework, performance indicators, best practices and technology to support communication and collaboration among supply chain partners, this aims to improve the effectiveness of supply chain management in companies. The SCOR (Supply Chain Operation Reference) model is also used as a basis for improving supply chain management, in a way:

1. Identify processes in language that can be communicated to all organizational and functional elements.

2. Using standard terminology and notation, and
3. Linking various activities with the right size/metric.

Although SCOR has many advantages, SCOR does not escape from a number of limitations, namely, the SCOR model does not cover the sales administration process, the technology development process, the product and process design and development process, and some post-delivery technical support processes.

The SCOR model consists of several main management process components, namely plan, source, make, deliver, return and enable. The SCOR model is an integrated system between beginning suppliers and end customers. The process is connected to form operational strategies, raw materials and information flow that is very useful for the company. Below is a picture of the SCOR (Supply Chain Operation Reference) process model).

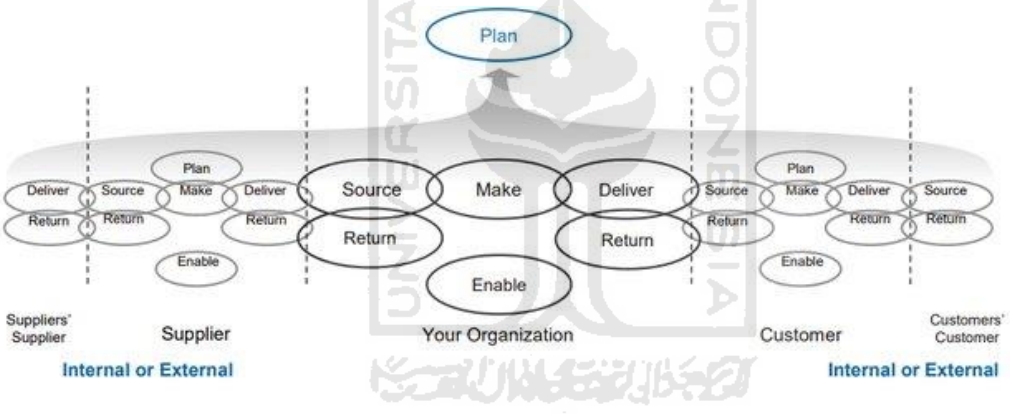


Figure 2.1 The SCOR Process Model

(Source: Supply Chain Operations Reference Model -Supply Chain Council)

There are some necessary components in the supply chain management system that must be met before the system is run (Paul, 2014), such as:

1. Plan

   The plan is the core and guide for the operation of a supply chain that has a function in providing a mechanism to balance the demand requirements and available resources, as well as the integration function among other process elements.
2. Source

The source is the process of ordering, sending, receiving, and transferring raw materials, sub-assemblies, goods and/or services. Activities include material acquisition (obtaining, receiving, inspecting, detaining, and releasing materials), management of warehousing of raw materials, transportation of raw materials, managing source business rules, and managing raw material inventory.

3. Make

   Make is the process of adding value to products through the processes of mixing, separating, forming, processing, and chemical processes. In the making process, there are activities that convert raw materials into finished goods.

4. Delivery

   This process carries out downstream order management and order fulfilment activities, including outbound logistics.

5. Return

   This process is the process of moving goods back from consumers through the supply chain to handle defects/damage to products, orders, or to carry out repair activities.

6. Enable

   Processes related to establishing, maintaining, monitoring information, relationships, resources, assets, business rules, conformity and contracts needed to run the supply chain.

Basically, the SCOR model forms four hierarchical level arrangements. However, Pujawan & Er (2017), states that the SCOR model is divided into three levels of measurement indicators. This is because the fourth level is considered too specific and the company is better to make its own measurement indicators to support the strategy they plan. The SCOR model levels include:

a. Level 1

   The top-level contains five key processes, namely plan, source, make, deliver and return. This level provides general definition information from the five core processes of a company's supply chain (Mutakin, 2011).

b. Level 2

Configuration level which will define the categories for each process that occurs at level 1 with the aim of simplifying the supply chain and increasing the flexibility of the entire supply chain.

c. Level 3

This level focuses on the details of supply chain activities such as planning, procurement, product manufacturing, shipping and returns.

SCOR focuses on measuring and evaluating the performance of a company's supply chain. Three essential elements, namely work attributes, metrics, and processes/practices are used to understand, evaluate and identify the performance of the company's supply chain. All SCOR metrics are grouped in one of the performance attributes (APICS, 2017). The performance attributes contained in SCOR, according to APICS (2017) are:

- Reliability

  Ability to perform tasks as expected. Reliability focuses on the predictability of the results of a process.
- Responsiveness

  The speed at which the task is performed. The speed at which the supply chain provides products to customers.
- Agility

  The ability to respond to external influences, the ability to respond to changing markets to gain or maintain competitive advantage.
- Asset

  The ability to utilize assets efficiently. Asset management strategies in the supply chain include inventory reduction and in-sourcing vs. outsourcing.
- Cost

  Operational costs of the supply chain process. This includes labor costs, material costs, management and transportation costs.

2.2.4 Snorm De Boer Normalization

The work assessment uses the metric work attributes in SCOR to have different units, so it is necessary to take steps to equalize all values. According to Ardhanaputra et al. (2019)

these unit parameters need to be compared using normalization. The normalization method used is the Snorm De Boer normalization method.

According to Trienekens & Hvolby (2000), there are two kinds of equations used in normalizing Snorm De Boer. The first equation is used when the largest data value becomes the best value, while the second equation when the smallest value becomes the best value. De Boer's Snorm formula:

- Larger is Better

$$\boldsymbol{Snorm\ (Score) = \frac{(S1 - Smax)}{Smax - Smin}\ x\ 100}$$

- Lower is Better

$$\boldsymbol{Snorm\ (Score) = \frac{(Smax - S1)}{Smax - Smin}\ x\ 100}$$

Where :

S1 : The actual indicator value that was successfully achieved

Smax : The value of achieving the best performance of performance indicators

S min : The value of the worst performance achievement

After the results of the Snorm calculation are obtained, it will be proceeded to group into several categories and conditions. According to Iriani (2009) in Lenny (2013), each performance indicator will have a performance value of 0-100. Table 2.2 below is the occupational indicator of the Snorm de Boer normalization category.

Table 2.2 Occupational Indicator Category

Indicator Value	**Occupational Indicator Category**
<40	Poor
40 – 50	Marginal

Indicator Value	Occupational Indicator Category
50 – 70	Average
70 – 90	Good
>90	Excellent

2.2.5 Marketing Concept

2.2.5.1 Customer Needs

Customer needs are defined as the needs of consumers for a product. Before determining the product to be made, a researcher must conduct market research by identifying consumer needs. The output of the identification of consumer needs can be in the form of a statement from the consumer which is translated into customer needs which are neatly arranged in a list that can be processed into a weight of importance for each need (Rizani & Satria, 2013). There are several tools that can be used to identify consumer needs, namely using questionnaires, focus groups, interviews and product observations when used.

2.2.6 SWOT Analysis

SWOT stands for Strengthen, Weakness, Opportunity, and Threat within the scope of the company. SWOT analysis is a systematic planning to compare the company's internal strengths and weaknesses with external opportunities and threats to become factors of success in the company (Rahayu & Retnani, 2016).

1. Strengthen

   Strength is one of the advantages possessed by a company in order to be able to compete with other companies. The strengths in question can be in the form of financial resources, market leadership, buyer and supplier relationships and so on.

2. Weakness

   Weakness is one of the limitations or shortcomings in terms of resources, skills, and capabilities that can become an obstacle for companies in meeting consumer needs for the products offered.

3. Opportunity

   Opportunity is one of the favorable conditions for the company. If the company analyzes market identification, the existence of technological changes in product manufacturing and establishing good relationships between buyers and suppliers can make the company have a good opportunity.

4. Threat

   Threat means unfavourable conditions for the company. Factors that can pose a threat to the company include the presence of new competitors, an increase in bargaining from buyers or suppliers, or changes in technology. Threats include potential obstacles for the company because they can harm the company in the present or future (Michael A. Hitt, 1997).

CHAPTER III

RESEARCH METHOD

3.1 Research Object

The object of this research is performance measurement on supply chain activities that will be carried out at PT. ABC (Singaraja unit) using the SCOR 12 method and involving customer of chicken product around Bali province. The product produced by this company is broiler chicken (live-bird). The research location is in the office of PT. ABC (Singaraja unit) on Jalan Raya Anturan No.20, Tukadmungga, Singaraja, Buleleng, Bali, and one of the company's poultry farm partner located on Jalan Seririt - Gilimanuk, Gondol Village, Gerokgak, Bali. Measurement of company performance aims to assess company performance during the Covid-19 pandemic. The results of performance measurements will be a reference for improving supply chain system performance at PT. ABC (Singaraja unit).

3.2 Data Collection Technique

There are two types of data used in this study, namely:

a. Primary Data

   Primary data is data obtained directly from the research object. The data used in this research are:

   1. Observation

      Direct observations will be carried out on the PT. ABC (Sigaraja unit) and poultry farm. The observation was carried out to directly observe the location and condition of the company in order to obtain the newest condition, overview of the overall business process and supply chain activities of the company needed for the calculation of performance using the SCOR 12 method.

   2. Interview

      Interviews will be conducted to the parties involved, such as the chief unit of PT. ABC (Singaraja unit), field counselor, and Poultry breeders in the production

department in order to obtain actual data to support data processing and SWOT data of PT. ABC (Singaraja unit) product.

3. Questionnaire

   The questionnaire aims to retrieve the enable process data addressed to the chief unit of PT. ABC (Singaraja unit) and customers of chicken product around Bali province to obtain their need about chicken product in Covid-19 pandemic.

3.3 Data Processing

After the necessary data are collected, the next step is data processing as follows:

3.3.1 SCOR 12 Calculation

a. Metrics Identification

   Data processing begins with identifying performance metrics that are tailored to the company's supply chain activities. The selection of performance metrics is based on each process in SCOR 12, namely plan, source, make, deliver, return and enable.

b. Performance Metrics Design

   Next is the preparation of the metrics hierarchy, compilation of definitions, formulas, and characteristics of the metrics that have been chosen.

c. Measurement of Performance Metrics

   After the required data are collected, then it will be proceeded with the calculation of the performance metrics for each selected process.

d. Snorm De Boer Normalization

   Snorm de Boer normalization is needed to equalize the different units in the calculation results for each process metrics.

3.3.2 Voice of Customer and SWOT Calculation

a. Voice of Customer Result

   Analysis of the results of distributing questionnaires regarding to customer needs for chicken products during the Covid-19 pandemic.

b. SWOT Analysis Based on Internal and External Factors

   Identifying internal and external factors in the company's products that affect the performance of a company in the future. The strategy used is IFAS (Internal Factor

Analysis Strategy), namely the Strength and Weakness of a product and EFAS (External Factor Analysis Strategy), namely Opportunity and Threat in a product.

3.4 Research Flowchart

The stages of this research are illustrated in the figure below,

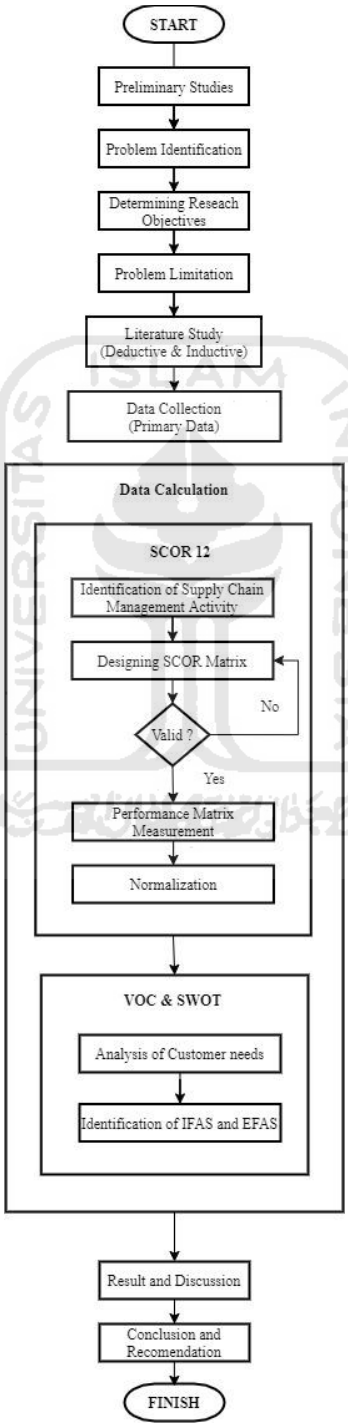


Figure 3.1 Research Flowchart

Explanation of the flowchart stage above are:

1. Preliminary Studies

   Researchers conduct learning about the material and concepts needed to support knowledge through learning theoretical theories and previous research.

2. Problem Identification

   At this stage, direct observation will be carried out to identify problems or obstacles that arise in the company's supply chain management system.

3. Determining Research Objectives

   The determination of the research objectives is done by direct observation and interviews with the company.

4. Problem Limitation

   It provides limits on research so that research remains focused on the objectives that have been formed.

5. Literature Study

   Literature study is conducted through inductive and deductive study to review previous research and theories needed in order to support the process of research.

6. Data Collection

   The data collection process is carried out by direct observations, interviews and designing questionnaires to obtain primary data.

7. Data Processing

   Data processing is done by identifying supply chain and business process activity in accordance with the process in SCOR 12, such as plan, source, make, deliver, and return. After that, designing metrics performance by determining metrics hierarchy, metrics definition, and metrics characteristic. The next is measuring the performance of each metric in every process of SCOR 12, followed by the normalization process for each performance metric with the aim of equalizing the unit of parameter values. After the SCOR 12 calculation is complete, it will be followed by a voice of customer analysis to determine the customer's desire for chicken products during the pandemic. Furthermore, IFAS and EFAS SWOT analysis will be carried out to determine the superiority of the product internally and externally as a reference for determining marketing strategies.

8. Analysis and Discussion

   After the results of performance measurements are obtained, an analysis and discussion are carried out to provide recommendations for improvement and decision making based on the results of data processing that has been carried out on the company's supply chain management system.

9. Conclusion and Recommendation

   Finishing Stage. The conclusion will be drawn from the current research conducted in the form of recommendations for improvement and decision making. Brainstorming will be carried out to consider all recommended actions. After that, suggestions will be given for further research to support the creation of better research.

CHAPTER IV

DATA COLLECTING AND PROCESSING

4.1 Data Collecting

Retrieval of data at PT. ABC (Singaraja unit) is carried out through direct observation, interviews, questionnaires, and documentation. The data taken are company profile data and supply chain business process data for processing SCOR 12 attributes starting from the plan, source, make and enable processes. The deliver and return process are not used because PT. ABC (Singaraja unit) does not implement a delivery order system, the product will be picked up by distributors or retailers as product buyers. PT. ABC (Singaraja unit) does not have a return policy because the product being traded is a living product where the living product is a product that cannot be repaired when a physical defect or damage occurs.

4.1.1 Company Profile

PT. ABC is a company engaged in the business of poultry farms. This company is a subsidiary of one of the largest and leading agri-food companies in Indonesia, which established since 1975, namely PT. Japfa Comfeed Indonesia. PT. ABC established to assist government programs in employment, improve community nutrition and technology transfer in animal feed. PT. ABC has branches in major regions in Indonesia, one of which is located in Bali. In facilitating the spread of livestock business in Bali, PT. ABC forms work units in every district in the city of Bali. It aims to reach remote areas in Bali.

PT. ABC has a cooperative relationship with breeders in all regions using a plasma core system. The plasma core system is a partnership relationship between small enterprise and medium enterprise or large enterprise. Medium enterprise or large enterprise will act as the core and small businesses as plasma. The core company will carry out guidance from the provision of production facilities, technical guidance, to product sales. PT. ABC will help farmers with limited capital to buy livestock production facilities and foster farmers to reach the company's target. The agreements between

companies and farmers will be bound in the contract system and will benefit both parties. The government in this case provides support in supervising that the partnership system runs justly through Minister of Agriculture Decree No. 472 / Kpts / TN.330 / 96. This policy regulates the implementation of the fostering of chicken farms, in the form of plasma core partnerships.

PT. ABC (Singaraja unit) produces commercial broiler chicken products and sold in kilograms to retailers, distributors and PT. Japfa Comfeed Indonesia itself. PT. ABC (Singaraja unit) serves distributors and retailers throughout the Buleleng regency to meet the needs of chicken meat for the Buleleng area. Uniquely, this company does not deliver chicken orders, but distributors or retailers who will take commercial broiler chicken products to partner farms.

4.1.2 The Plasma Core Organizational Structure

The picture below is a plasma core organizational structure of PT. ABC (Singaraja unit).

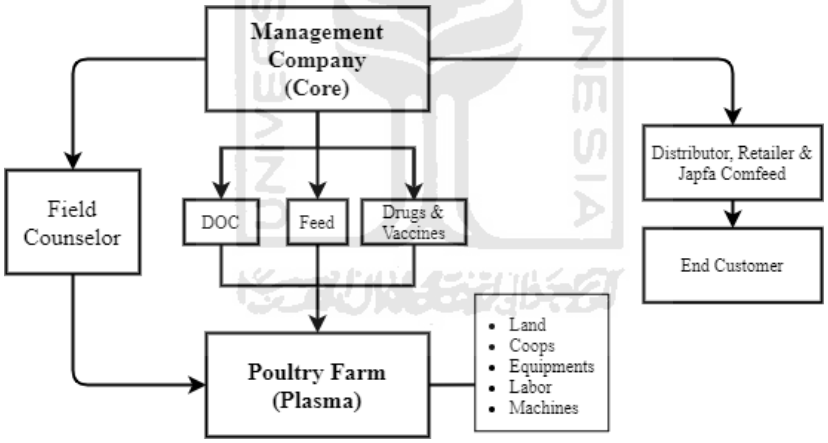


Figure 4.1 Plasma Core Organizational Structure

In the figure of the plasma core organizational structure above, it can be seen that the core company will supply DOC (Day Old Chicken), feed, and drug vaccines to plasma farms. In addition, the core company will also send field counsellors to provide guidance to obtain maximum results. Plasma farms have an obligation to provide land, chicken coops, tools, machinery and workers as capital from plasma farms. In Figure 4.1 above, we can also see that poultry farms do not need to sell and find buyers because the core company will take the obligation to sell all production output.

4.1.3 Company Organizational Structure

PT. ABC (Singaraja unit) has an organizational structure to facilitate an effective and efficient management system and work system. Below is a picture of the organizational structure of PT. ABC (Singaraja unit).

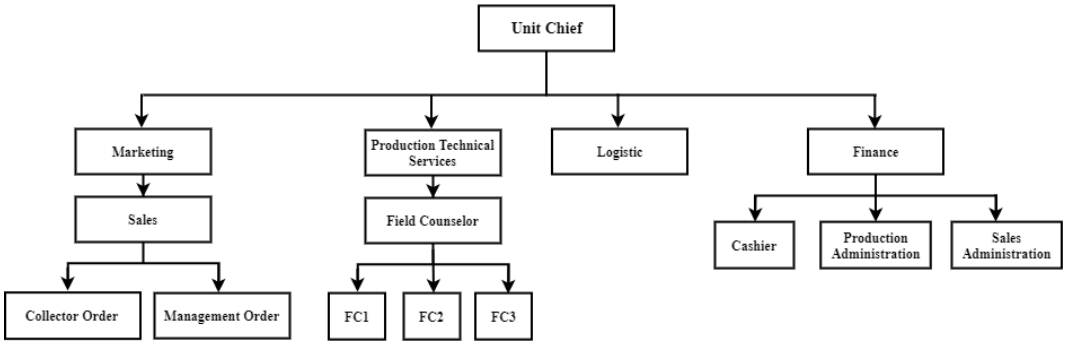


Figure 4.2 Company Organizational Structure

a. Marketing

The marketing division has responsible for data processing and product marketing documents. Besides, the marketing division has the obligation to make marketing and product sales reports, because the chief of the unit will examine and check the monthly marketing and sales reports. The marketing division is in charge of sales that offer services to new customers / prospective customers. Thus, sales are divided into two categories, such as order collectors and order management. The order collector will collect requests made by the customer, then make arrangements to collect product requests.

b. Production Technical Services

The Production Technical Services division takes the role of the manager in livestock production on poultry farms. Poultry feed from the central company Japfa Comfeed Indonesia will routinely be given to livestock on poultry farms. In addition, the technical part of production service also checks the distribution warehouse and breeder coops to bridge them both as representatives of the logistics admin who regulates the problem of distribution of feed from suppliers to farms as well as representatives of production admin in the matter of feed transfer.

c. Logistic

The division that handles problems and processes the distribution data of poultry feed from suppliers to the breeder's coops is called the Logistics Unit. Livestock feed available at the supplier's warehouse is distributed to farmers through requests to the Field Counselor (FC) of PT. ABC (Singaraja unit). Requests for feed by farmers to FC must be made two days before shipping the feed. After the FC feed request documents are received, the FC documents submitted to the logistics unit for data processing. Furthermore, the logistics unit will contact the supplier to meet the farmer's feed demand. The driver in the warehouse will deliver the feed to the breeder coops using transportation owned by the supplier's feed warehouse. The feed will be monitored in quantity, documents and delivery by the logistics unit.

d. Finance

This division manages the company's financial cash data, including the company's income and expenses. The finance section oversees the production administrator who manages the transfer of feed, supervises the sales admin who also correlates with the marketing section and oversees the cashier who focuses on calculating financial data.

4.1.4 Production Process

The stages of the production process at PT. ABC (Singaraja unit) can be seen in the figure below.

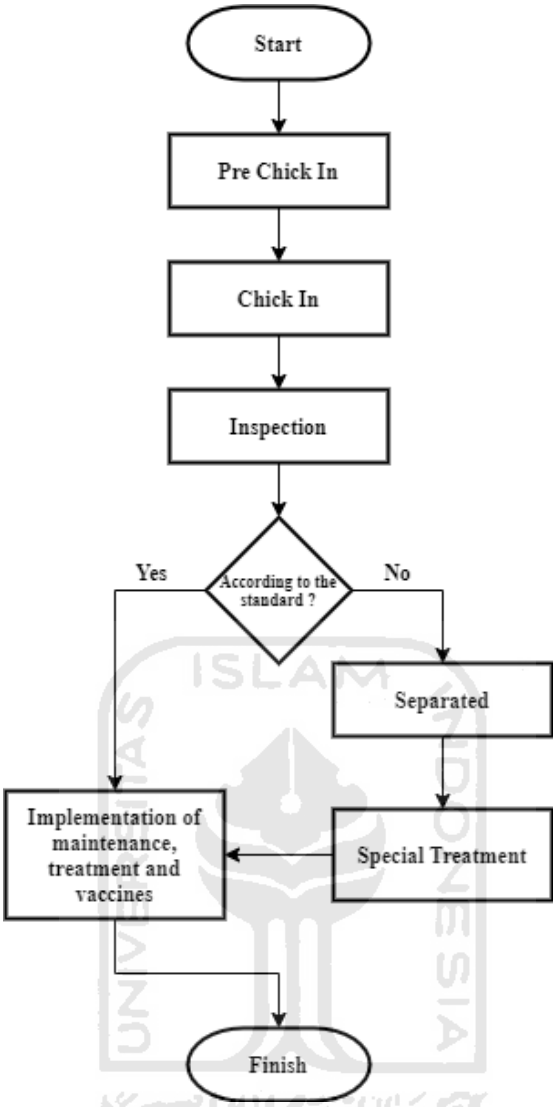


Figure 4.3 Production Process

a. Pre Chick In

The initial stage of the broiler chicken production process begins with the pre chick in process. Pre chick in is the preparation period of the chickens' coop before the chick in. This stage is the most crucial stage in chickens' treatment to avoid the emergence of infectious diseases that cause death when maintaining the chickens. The pre chick in process takes two weeks to cover the implementation of strict biosecurity procedures, preparation of coop equipment, sterilization of containers, drinking water and maintenance of coop heaters.

b. Chick In

The next stage is the process of chick in, chick in is a stage where DOC (Day Old Chicken) which is a day old comes to poultry farms to be raised. When the DOC arrives, the breeder must immediately move the DOC from the truck and conduct an inspection.

c. Inspection

Inspections that will be carried out by farmers are weighing, counting and selecting DOC quality. DOC samples weighed around 10-20%. If there are DOCs that do not meet breeder standards (above or below standard), the DOC will be separated and given special treatment. Poor quality DOCs such as lethargy, dull hair, cloudy or sore eyes and excess weight will potentially be a source of disease for other DOCs. In addition, poor quality DOC will reduce the percentage of body weight uniformity which will make it difficult for farmers to achieve maximum production. After the DOC is declared passed the selection stage, the DOC will stock in brooding (artificial heating) for maintenance.

d. Treatment

During the period of treatment and maintenance, breeders must pay attention to nutrition and the environment for each chicken being cared for, nutrition provided includes quality feed, vitamins, drugs and vaccines in supporting and increasing chicken growth. In addition, breeders will monitor the temperature in the coop to keep it stable and pay attention to the health of chickens to be able to achieve maximum production for 35-42 days (one period).

4.1.5 Company Supply Chain

Figure 4.4 below shows the company's supply chain flow.

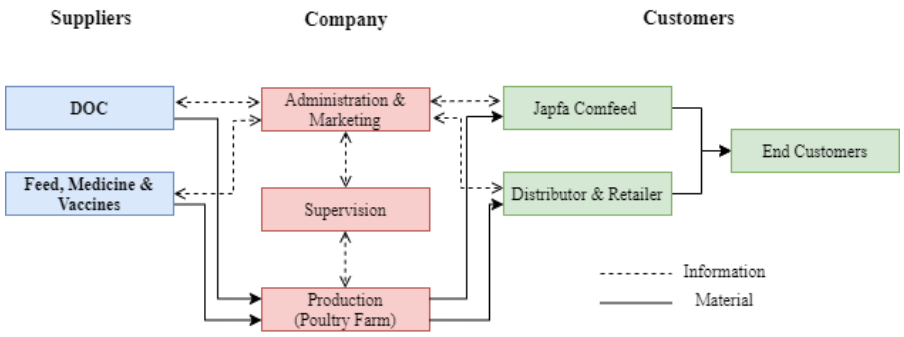


Figure 4.4 Company Supply Chain

The supply chain flow of PT. ABC (Singaraja unit) is started with ordering two types of raw materials, such as DOC (Day Old Chicken) and livestock production facilities. There is a flow of information between the administration and suppliers regarding to the transfer of livestock production facilities to the poultry farm. After that, suppliers will supply raw materials to the production department (poultry farmers) as a partner of the company to begin production or further maintenance of DOC. The company will send field counselors as supervisors to the poultry farm to achieve maximum production in accordance with the company's target. There is a flow of information between the poultry farm and the field counselor agent related to the development of chicken rearing. After that, the field counselor agent will present the latest developments in poultry farms related to production feed requirements to the production administration. Then there is a flow of information between the marketing and customers when there is a transaction of sale and purchase between the two parties. Later, after the sale and purchase transaction is successful and the product is ready to sell, there is a material flow from the poultry farm to the customers. The company will not send products to customers, but customers will take the products at the poultry farm according to the agreement of the marketing and customers.

4.2 Data Processing SCOR 12

4.2.1 Performance Metrics Design

The design of performance metrics begins with compiling a supply chain management performance hierarchy at PT. ABC (Singaraja unit). The arrangement is adjusted to the situation of PT. ABC (Singaraja unit) by verifying and validating the hierarchy used in order to obtain the maximum SCOR 12 calculation

4.2.1.1 Supply Chain Management Performance Hierarchy

Figure 4.5 below shows the company's supply chain management hierarchy.

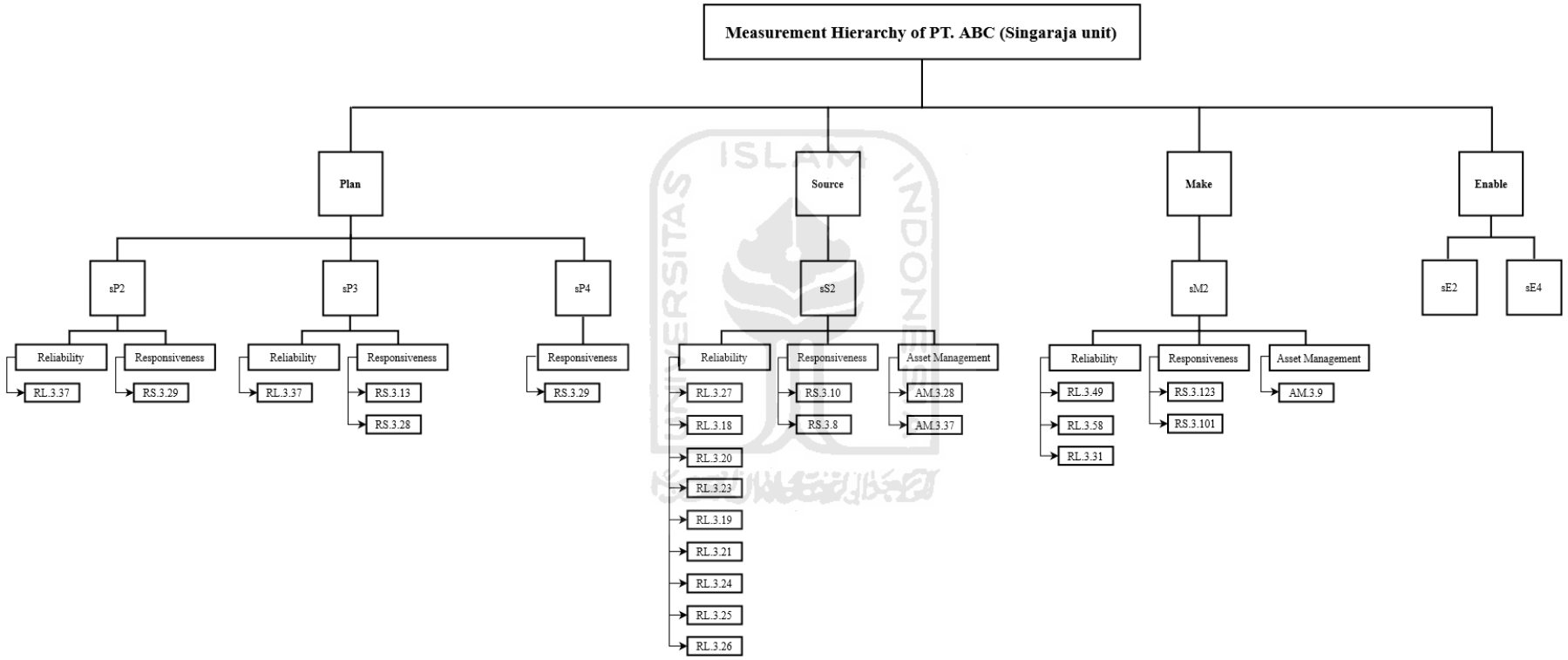


Figure 4.5 Supply Chain Management Performance Hierarchy

The preparation of supply chain management performance hierarchy begins with identifying the company's business processes. The arrangement of this performance hierarchy is designed based on the state of PT. ABC (Singaraja unit) is followed by determining the elements of the process components in the company's business activities. This element is included in the level 1 metric. Followed by the determination of the hierarchy and selection of metrics to be used in each element that is adjusted to the conditions of the company. If the metrics in the hierarchy are level 2, then the next step is further elaboration to obtain level 3 metrics. After the company's supply chain management performance hierarchy is formed, the performance value will be calculated. The performance value is included in level 1 metrics, to get the performance value, the calculation started from metrics level 3 in order to get the value of level 2 metrics, followed by the calculation of level 2 metrics to know the value of level 2 metrics.

In the figure above, it can be seen that there are four main processes of business process activities at PT. ABC (Singaraja unit) based on SCOR 12, such as plan, source, make and enable processes that are at level 1 metric. The plan process has a hierarchy of sP2, sP3 and sP4 with the attributes of reliability and responsiveness. The source and make processes consist of sS2 and sM2, which both have the attributes of reliability, responsiveness and asset management, while the enable process uses the sE2 and sE4 hierarchy and the enable process do not have attributes or performance metrics.

4.2.1.2 Definition of Supply Chain Management Performance Metrics

The design of performance metrics adjusted to the conditions of business activities at PT. ABC (Singaraja unit) consists of plan, source, make and enable processes. The enable process only uses hierarchy because the enable process has no metrics at level 2 or 3. The following table is an explanation of each metric and hierarchy.

Table 4.1 Definition of Supply Chain Management Performance Metrics

SCOR 12			Metrics	Definition
Level 1	**Level 2**	**Level 3**		
Plan	sP2 Plan Source	sP2.1 Identify, Prioritize and Aggregate Product Requirements	RL 3.37 Forecast Accuracy	Percentage of accuracy in predict the procurement of raw materials
		sP2.4 Establish Sourcing Plans	RS 3.29 Establish Sourcing Plans Cycle Time	The average time associated with establishing and communicating source plans
	sp3 Plan Make	sP3.1 Identify, Prioritize and Aggregate Production Requirements	RL.3.37 Forecast Accuracy	Percentage of accuracy in predict sales requests

SCOR 12			Metrics	Definition
Level 1	**Level 2**	**Level 3**		
		sP3.3 Balance Production Resources with Production Requirements	RS.3.13 Balance Production Resources with Production Requirements Cycle Time	The average time associated with the identifying, prioritizing, and aggregating product requirements
		sP3.4 Establish Production Plans	RS.3.28 Establish Production Plans Cycle Time	The average time associated with establishing and communicating production plans
	sP4 Plan Deliver	sP4.4 Establish Delivery Plans	RS.3.27 Establish Delivery Plans Cycle Time	The average time associated with establishing and communicating deliver plans
Source	sS2 Source Make-to-Order Product	sS2.1 Schedule Product Deliveries	RL.3.27 % Schedules Changed within Supplier's Lead Time	The number of schedules that are changed within the suppliers lead-time
			RS.3.10 Average Days per Schedule Change	The number of days late that affects the delivery of raw materials from suppliers

SCOR 12			Metrics	Definition
Level 1	**Level 2**	**Level 3**		
		sS2.2 Receive Product	RL.3.18 % Orders/ Lines Processed Complete	The number of orders / lines that are processed complete
			RL.3.20 % Orders/ Lines Received On-Time To Demand Requirement	The number of orders / lines that are received on- time to the demand requirements
			RL.3.23 % Orders/ Lines Received with Correct Shipping Documents	The number of orders / lines that are received on- time with correct shipping documents
		sS2.3 Verify Product	RL.3.19 % Orders/ Lines Received Defect Free	The number of orders / lines that are received defect free
			RL.3.21 % Orders/ lines received with correct content	Percent of orders or lines received that have the correct material content as specified in the product design specs and supplier agreements.

SCOR 12			Metrics		Definition
Level 1	**Level 2**	**Level 3**			
			RL.3.24 % Orders/lines received damage free		The number of orders / lines that are processed damage free
		sS2.4 Transfer Product	RL.3.25 % Product Transferred On-Time to Demand requirement		The number of product orders / lines that are transferred on-time to demand requirements
			RL.3.26 % Product Transferred without Transaction Errors		The number of transactions processed without error
			AM.2.2 Inventory Days of Supply	AM.3.28 Percentage Defective Inventory	The value of defective product inventory as a percentage of the value of total inventory

SCOR 12			Metrics	Definition
Level 1	**Level 2**	**Level 3**		
			AM.3.37 Percentage Excess Inventory	The value of excess inventory as a percentage of the value of total inventory
		sS2.5 Authorize Supplier Payment	RS.3.8 Authorize Supplier Payment Cycle Time	The average time associated with authorizing payment to suppliers
Make	sM2 Make-to-Order	sM2.1 Schedule Production Activities	RL.3.49 Schedule Achievement	The percentage of time that a plant achieves its production schedule
			RS.3.123 Schedule Production Activities Cycle Time	The average time associated with scheduling production activities

SCOR 12			Metrics	Definition
Level 1	**Level 2**	**Level 3**		
			AM.3.9 Capacity Utilization	A measure of how intensively a resource is being used to produce a good or service
		sM2.3 Produce and Test	RL.3.58 Yield	The ratio of usable output from a process to its input
			RS.3.101 Produce and Test Cycle Time	The average time associated with production and test
		sM2.4 Package		Percentage of compliance documentations are complete, correct, and readily available when and how expected by customer, Government and other supply chain regulatory entities. Compliance documentation
			RL.3.31 Compliance Documentation Accuracy	

SCOR 12			Metrics	Definition
Level 1	**Level 2**	**Level 3**		
				includes material safety data sheets
Enable	sE2 Manage Supply Chain Performance	sE2.1 Initiate Reporting	-	
		sE2.2 Analyze Reports	-	
		sE2.3 Find Root Causes	-	
		sE2.4 Prioritize Root Causes	-	
		sE2.5 Develop Corrective Actions	-	
		sE2.6 Approve & Launch	-	
	sE4 Manage Supply Chain Human Resources	sE4.1 Identify Skills/ Resource Requirement	-	
		sE4.2 Identify Available Skills/Resources	-	

SCOR 12			Metrics	Definition
Level 1	**Level 2**	**Level 3**		
		sE4.3 Match Skills/ Resources	-	
		sE4.4 Determine Hiring/ Redeployment	-	
		sE4.5 Determine Training/ Education	-	
		sE4.6 Approve, Prioritize and Launch	-	

4.2.2 Formulation of Performance Metrics

4.2.2.1 Formulation of Metrics on the Plan, Source and Make Processes

The table below explains the formulas for each metric in the three processes such as plan, source and make. There are two categories of characteristics used in the Snorm de Boer normalization stage, namely the larger is better category and the smaller is better category.

Table 4.2 Metrics Performance Formula

No	Metrics	Formula	Unit	Characteristic
		PLAN		
1	RL 3.37 Forecast Accuracy	$100 - (\frac{Actual\ order\ -\ Product\ forecasting}{Actual\ order} x\ 100)$	%	Larger is better
2	RS 3.29 Establish Sourcing Plans Cycle Time	The average time needed to plan the amount of raw material	Day	Smaller is better
3	RL.3.37 Forecast Accuracy	$100 - (\frac{Actual\ demand - Demand\ forecasting}{Actual\ demand} x\ 100)$	%	Larger is better
4	RS.3.13 Balance Production Resources with	The average time needed to identify, prepare and combine the planned use of resources (human, raw materials, machinery, costs) required	Day	Smaller is better

No	Metrics	Formula	Unit	Characteristic
	Production Requirements Cycle Time			
5	RS.3.28 Establish Production Plans Cycle Time	The average planning time from the product design process to the finish product	Day	Smaller is better
6	RS.3.27 Establish Delivery Plans Cycle Time	The average time needed to plan a finished product until the product is received by consumers	Day	Smaller is better
		SOURCE		
7	RL.3.27 % Schedules Changed within	$\frac{Amount\ of\ change\ in\ raw\ material\ delivery\ schedule\ due\ to\ lead\ time}{Amount\ of\ shipping\ schedules\ agreed} x\ 100$	%	Smaller is better

No	Metrics	Formula	Unit	Characteristic
	Supplier's Lead Time			
8	RS.3.10 Average Days per Schedule Change	$\frac{Total\ schedule\ changes\ that\ affect\ the\ delivery\ date}{Total\ schedule\ changes}$	Times	Smaller is better
9	RL.3.18 % Orders/ Lines Processed Complete	$\frac{Total\ delivery\ of\ raw\ materials\ with\ appropriate\ specifications\ and\ quantities}{Total\ ordering\ of\ raw\ materials} x\ 100$	%	Larger is better
10	RL.3.20 % Orders/ Lines Received On-Time To Demand Requirement	$\frac{Total\ delivery\ of\ raw\ materials\ in\ a\ timely\ manner\ and\ according\ to\ quantity}{Total\ ordering\ of\ raw\ materials} x\ 100$	%	Larger is better
11	RL.3.23 % Orders/ Lines	$\frac{Total\ shipment\ of\ raw\ materials\ with\ complete\ and\ appropriate\ documents}{Total\ ordering\ of\ raw\ materials} x\ 100$	%	Larger is better

No	Metrics	Formula	Unit	Characteristic
	Received with Correct Shipping Documents			
12	RL.3.19 % Orders/ Lines Received Defect Free	$\frac{Total\ of\ arrival\ raw\ materials\ without\ defects}{Total\ ordering\ of\ raw\ materials} x\ 100$	%	Larger is better
13	RL.3.21 % Orders/ lines received with correct content	$\frac{Total\ arrivals\ of\ raw\ materials\ that\ meet\ specifications}{Total\ ordering\ of\ raw\ materials} x\ 100$	%	Larger is better
14	RL.3.24 % Orders/lines received damage free	$\frac{Total\ arrivals\ of\ raw\ materials\ without\ any\ damage}{Total\ ordering\ of\ raw\ materials} x\ 100$	%	Larger is better

No	Metrics	Formula	Unit	Characteristic
15	RL.3.25 % Product Transferred On-Time to Demand Requirement	$\frac{Total\ ordering\ of\ raw\ materials\ that\ arrive\ on\ time}{Total\ ordering\ of\ raw\ materials} x\ 100$	%	Larger is better
16	RL.3.26 % Product Transferred without Transaction Errors	$\frac{Total\ ordering\ of\ raw\ materials\ without\ a\ transaction\ failure\ or\ error}{Total\ ordering\ of\ raw\ materials} x\ 100$	%	Larger is better
17	AM.3.28 Percentage Defective Inventory	$\frac{Total\ value\ of\ defective\ product\ inventory}{Total\ value\ of\ raw\ material\ inventory} x\ 100$	%	Smaller is better

No	Metrics	Formula	Unit	Characteristic
18	AM.3.37 Percentage Excess Inventory	$\frac{Total\ value\ of\ excess\ inventory}{Total\ value\ of\ raw\ material\ inventory} x\ 100$	%	Smaller is better
19	RS.3.8 Authorize Supplier Payment Cycle Time	Total time for payment of raw materials	Day	Smaller is better
20	RL.3.49 Schedule Achievement	MAKE $\frac{Amount\ of\ products\ finished\ on\ time}{The\ total\ number\ of\ products\ that\ be\ able\ to\ produced} x\ 100$	%	Larger is better
21	RS.3.123 Schedule Production Activities Cycle Time	The average time of manufacture of products according to the schedule	Day	Smaller is better

No	Metrics	Formula	Unit	Characteristic
		$\frac{The\ actual\ output\ of\ products\ produced}{Maximum\ capacity\ of\ products\ that\ be\ able\ to\ produced}$		
22	AM.3.9 Capacity Utilization	$\frac{Total\ workers\ used\ in\ the\ production\ process}{Total\ workers\ overall}$	-	Larger is better
		$\frac{Total\ machines\ used\ in\ the\ production\ process}{Total\ machine}$		
23	RL.3.58 Yield	$\frac{Total\ products\ passed\ quality\ control}{Total\ products\ produced}$	-	Larger is better
24	RS.3.101 Produce and Test Cycle Time	The average of production time and sample testing	Day	Smaller is better
25	RL.3.31 Compliance Documentation Accuracy	$\frac{Total\ products\ with\ complete\ documents\ in\ the\ packaging\ process}{Total\ products\ packed} x\ 100$	%	Larger is better

4.2.2.2 Formulation of the Enable Process

The enable process does not have metrics at level 3. Data collection is done by using a series of activities in each of the existing hierarchy. The table 4.3 below shows the series of activities in the enable process.

Table 4.3 Enable Process Formula

Enable	Hierarchy	Activity
sE2 Manage Supply Chain Performance	sE2.1 Initiate Reporting	Reporting Requirements
		Risk Monitoring Requirement
		Customer Escalation
		Supplier Escalation
	sE2.2 Analyze Reports	Weekly Reports
		Quarterly Reports
		Daily Reports
		Annual Reports
		Monthly Reports
	sE2.3 Find Root Causes	Detailed Performance Gap
	sE2.4 Prioritize Root Causes	Root Cause
	sE2.5 Develop Corrective Actions	Prioritized Root Cause
		Skills/ Resource Change
		Network Configuration Change

Enable	Hierarchy	Activity
	sE2.6 Approve & Launch	Corrective Action
sE4 Manage Supply Chain Human Resources	sE4.1 Identify Skills/ Resource Requirement	Sourcing Plans
		Production Plans
		Distribution Plan
		Skills/ Resource Change
		Return Plans
		Skill/ Resource Gap
	sE4.2 Identify Available Skills/Resources	Request for Skills/ Resource Data
	sE4.3 Match Skills/ Resources	List of Available Skills/ Resources
		List of Available and Launch Skills/ Resources
		Hiring Plan
		Redeployment Plan
		Training Plan
	sE4.4 Determine Hiring/ Redeployment	Skill/ Resource Gap
		Budget - Salaries
	sE4.5 Determine Training/ Education	Skill/ Resource Gap
		Budget - Training

Enable	Hierarchy	Activity
	sE4.6 Approve, Prioritize and Launch	Proposed Training Plan Proposed Staffing Plan

Questionnaires were distributed to obtain data on the enable process. Filling in the enable process questionnaire is carried out for each activity in accordance with company conditions using a Likert scale of 1 to 5. Explanation of each scale based on APICS 2017:

1 = Novice

Rating on a scale of 1 means that the worker has no experience and needs detailed guidance. Novice is usually owned by new workers who lack experience in their fields because they are in the process of learning.

2 = Beginner

Rating on a scale of 2 means that the worker is good enough to do the work but with limited situational perception.

3 = Competent

Assessment on a scale of 3 means that the workers be able to understand the work and determine priorities to achieve the goal.

4 = Proficient

Assessment on a scale of 4 means that workers are familiar with all aspects of the work being carried out and be able to carry out supervision. In contrast to the competent level, workers at this level be able to prioritize based on situational aspects.

5 = Expert

Assessment on a scale of 5 means that workers already have an intuitive understanding and be able to apply patterns of experience to a variety of new situations.

4.2.3 Measurement of Performance Metrics

Measurement of performance metrics has two types of measurements such as the actual value of the performance metrics calculation and the calculation of the final value of the

performance metrics. Calculation of the actual value of the metric obtained from data processing PT. ABC (Singaraja unit) for each metric and final value calculation is obtained after normalization using Snorm de Boer normalization.

4.2.3.1 The Actual Value of Performance Metrics Calculation

Calculation of the actual value of performance metrics includes calculations on each process that exists at PT. ABC (Singaraja unit) such as plan, source, make and enable. The data used in the calculation of the actual value is the last four periods in February, March, April and May 2020. The data on February used because in this month the coronavirus pandemic began to spread in Indonesia. All metric formulas could be seen in the formula table. Below is the example of calculating the actual value of the performance metric RL.3.37 Forecast Accuracy on providing raw materials could be revealed by using below formulas:

$$100 - \left(\frac{Actual\ order - Forecasting\ order}{Actual\ order} x\ 100\right)$$

February 2020,

$$= 100 - \left(\frac{330.000 - 330.000}{330.000} x\ 100\right) = 100\%$$

March 2020,

$$= 100 - \left(\frac{330.000 - 330.000}{330.000} x\ 100\right) = 100\%$$

April 2020,

$$= 100 - \left(\frac{325.000 - 300.000}{300.000} x\ 100\right) = 91{,}67\%$$

May 2020,

$$= 100 - \left(\frac{300.000 - 220.000}{300.000} x\ 100\right) = 63{,}64\%$$

Average RL.3.37 Forecast Accuracy in four periods,

$$= \left(\frac{100\ \% + 100\% + 91{,}67\% + 63{,}64\%}{4} x\right) = 88{,}83\%$$

1. Plan

a. Reliability

Calculation RL.3.37 Forecast Accuracy in the process of plan is divided into two types, namely forecast accuracy for the supply of raw materials and forecast accuracy for product demand. The calculation formula can be seen in the formula table. Calculation of forecast accuracy could be seen in the table below:

- RL.3.37 Forecast Accuracy Source

  Calculation data RL.3.37 Plan Source metric can be seen in the table below.

Table 4.4 Calculation of RL.3.37 Plan Source Metric

Month	Source Forecasting	Ordering of Raw Materials	Forecast Accuracy (%)	Average (%)
February	330.000	330000	100,00	88,83
March	330.000	330000	100,00	
April	325000	300000	91,67	
May	300000	220000	63,64	

In the table above, it can be seen that there is a decline in the forecasting of raw materials and ordering raw materials during February to May. In February and March, forecast accuracy results are very good at 100% but entering April and May the results have decreased by 91.67% in April and 63.64% in May. The average value obtained during the four periods totaled 88.83%.

- RL.3.37 Forecast Accuracy Production Requirements

  Calculation data RL.3.37 Plan Make metric can be seen in the table below.

Table 4.5 Calculation of RL.3.37 Plan Make Metric

Month	Forecasting Demand	Actual Demand	Forecast Accuracy (%)	Average (%)
February	320.000	313500	97,92	88,28
March	320.000	313500	97,92	
April	310000	285000	91,23	
May	280000	209000	66,03	

In table 4.5, there was a decrease in demand forecasting and a decrease in product demand during the months of February to May. In February and March, the forecast accuracy results were quite good, namely at 97.92%. However, entering April and May, there was a decrease in the results of 91.23% in April and 66.03% in May. The average value obtained during the four periods totaled 88.28%.

b. Responsiveness

The metrics used in the responsiveness attribute are RS.3.29 Establish Sourcing Plans Cycle Time, RS.3.13 Balance Production Resources with Production Requirements Cycle Time, RS.3.28 Establish Production Plans Cycle Time, and RS.3.27 Establish Delivery Plans Cycle Time. The data used in this calculation are the average time to plan each metric. The following are the calculation table for each metric:

Table 4.6 Calculation of RS.3.29, RS.3.13, RS.3.28 & RS.3.27 Metrics

Metrics	**Planning**	**Month (Day)**				**Average**
		February	**March**	**April**	**May**	**(Day)**
RS.3.29	Raw Material	1	1	1	1	1
RS.3.13	Resource	2	2	2	2	2
RS.3.28	Production	1	1	1	1	1
RS.3.27	Delivery	1	1	1	1	1

From the table above, it is concluded that the planning of each metric does not require more than two days. The average of the RS.3.29, RS.3.13, RS.3.28 and RS.3.27 metrics are 1, 2, 1 and 1.

2. Source

a. Reliability

1) RL.3.27 % Schedules Changed within Supplier's Lead Time

Calculation data RL.3.27 metric can be seen in the table below.

Table 4.7 Calculation of RL.3.27 Metric

Month	Total (Times)		Percentage (%)	Average (%)
	Change of Delivery Schedule	Delivery Schedule Agreed		
February	0	20	0	0
March	0	20	0	
April	0	20	0	
May	0	18	0	

In table 4.7 above, the percentage of schedule changes that caused by supplier's lead time is 0% because never been a change in the delivery schedule between the supplier and PT. ABC (Singaraja unit). The average value obtained in this calculation is 0%, along with the percentage obtained.

2) RL.3.18 % Orders/ Lines Processed Complete

Calculation data RL.3.18 metric can be seen in the table below.

Table 4.8 Calculation of RL.3.18 Metric

Month	Total (Times)		Percentage (%)	Average (%)
	Delivery According to Specifications and Quantity	Ordering of Raw Materials		
February	20	20	100	100
March	20	20	100	
April	20	20	100	
May	18	18	100	

The table above explains that all shipments of raw materials always meet specifications and quantity and there is no gap at the time of delivery. It is indicated by the value of 100% on the percentage and the average value obtained at the time of calculation.

3) RL.3.20 % Order/ Lines Received On-Time to Demand Requirements

Calculation data RL.3.20 metric can be seen in the table below.

Table 4.9 Calculation of RL.3.20 Metric

Month	Total (Times)		Percentage (%)	Average (%)
	Timely Delivery and Appropriate Quantity	Ordering of Raw Materials		
February	20	20	100	100
March	20	20	100	
April	20	20	100	
May	18	18	100	

The table above explains that the delivery of raw materials by the supplier is always on time and in accordance with the quantity, and there is no gap between the total delivery of raw materials in a timely manner and according to the quantity with the number of raw material orders. This is indicated by the percentage value of 100%, followed by the average gain of 100%.

4) RL.3.23 % Orders/ Lines Received with Correct Shipping Documents

Calculation data RL.3.23 metric can be seen in the table below.

Table 4.10 Calculation of RL.3.23 Metric

Month	Total (Times)		Percentage (%)	Average (%)
	Shipping with Complete Documents	Ordering of Raw Materials		
February	20	20	100	100
March	20	20	100	
April	20	20	100	
May	18	18	100	

Table 4.10 explains that all shipments of raw materials have complete documents, so there is no gap between raw material shipments and complete documents with total raw material orders. This is shown through the calculation of the percentage of 100% followed by the average value of 100%.

5) RL.3.19 % Orders/ Lines Received Defect Free

Calculation data RL.3.19 metric can be seen in the table below.

Table 4.11 Calculation of RL.3.19 Metric

Month	Total (Times)		Percentage (%)	Average (%)
	Arrival of Raw Material Orders Without Defects	Ordering of Raw Materials		
February	20	20	100	100
March	20	20	100	
April	20	20	100	
May	18	18	100	

The table above concludes that all raw material arrivals did not experience product defects. This is assessed from the calculation of the percentage with 100% results, followed by the average value of 100%.

6) RL.3.21 % Orders/ lines received with correct content

Calculation data RL.3.21 metric can be seen in the table below.

Table 4.12 Calculation of RL.3.21 Metric

Month	Total (Times)		Percentage (%)	Average (%)
	Arrival of Raw Material Orders According to Specifications	Ordering of Raw Materials		
February	20	20	100	100
March	20	20	100	
April	20	20	100	
May	18	18	100	

The table above concludes that all raw materials sent by the supplier are in accordance with specifications without any shipping gap. This is indicated by the results of the percentage calculation of 100%, followed by the average value of 100% as well.

7) RL.3.24 % Orders/lines received damage free

Calculation data RL.3.24 metric can be seen in the table below.

Table 4.13 Calculation of RL.3.24 Metric

Month	Total (Times)		Percentage (%)	Average (%)
	Arrival of Raw Material Orders Without Damage	Ordering of Raw Materials		
February	20	20	100	100
March	20	20	100	
April	20	20	100	
May	18	18	100	

The table above explains that the delivery of raw materials by the supplier does not occur damage. This is supported by the acquisition of the percentage value of 100% followed by the average value of 100%.

8) RL.3.25 % Product Transferred On-Time to Demand Requirement

Calculation data RL.3.25 metric can be seen in the table below.

Table 4.14 Calculation of RL.3.25 Metric

Month	Total (Times)		Percentage (%)	Average (%)
	Timely Arrival of Raw Materials Orders	Ordering of Raw Materials		
February	20	20	100	100
March	20	20	100	
April	20	20	100	
May	18	18	100	

The table above shows that all raw materials arrive on time and there is never a delay in delivery. This is supported by the acquisition of the percentage value of 100% followed by the average value of 100%.

9) RL.3.26 % Product Transferred without Transaction Errors

Calculation data RL.3.26 metric can be seen in the table below.

Table 4.15 Calculation of RL.3.26 Metric

Month	Total (Times)		Percentage (%)	Average (%)
	Total Ordering of Raw Materials Without Error	Total Raw Material Transactions		
February	20	20	100	100
March	20	20	100	
April	20	20	100	
May	18	18	100	

The table above concludes that there has never been an error transaction during these four periods, supported by the acquisition of the percentage of 100% and the average value of 100%.

b. Responsiveness

- RS.3.10 Average Days per Schedule Change

Calculation data RS.3.10 Metric can be seen in the table below

Table 4.16 Calculation of RS.3.10 Metric

Month	Total (Day)		Value	Average
	Schedule Changes That Affect Shipping	Schedule Changes Occur		
February	0	0	0	0
March	0	0	0	
April	0	0	0	
May	0	0	0	

The table above explains that there has never been a change in schedule that affects shipping, so the calculation result is 0 followed by the average calculation amount which is also 0.

- RS.3.8 Authorize Supplier Payment Cycle Time

  Calculation data RS.3.8 Metric can be seen in the table below.

Table 4.17 Calculation of RS.3.8 Metric

Payment Time	Month (Day)				Average (Day)
	February	March	April	May	
Raw Material	1	1	1	1	1

The table above explains that for four periods, PT. ABC (Singarja unit) only takes 1 day to pay for raw material transactions, this is followed by the average payment value of 1 day.

c. Asset Management

- AM.3.28 Percentage Defective Inventory

  Calculation data AM.3.28 Metric can be seen in the table below.

Table 4.18 Calculation of AM.3.28 Metric

Month	Total Inventory of Defective Products	Total Raw Material Inventory	Price / Square Feet	Percentage (%)	Average (%)
February	0	330000	4500	0,00	0,00
March	0	330000	4500	0,00	
April	0	300000	4500	0,00	
May	0	220000	4500	0,00	

The table above shows that there is no defective product inventory, no gap between the defective product inventory and the existing raw material inventory. This is supported by the acquisition of the percentage calculation of 0% and the average value of 0% as well.

- AM.3.37 Percentage Excess Inventory

  Calculation data AM.3.37 Metric can be seen in the table below.

Table 4.19 Calculation of AM.3.37 Metric

Month	Total Raw Material Inventory (Square Feet)	Total Raw Materials Used (Square Feet)	Gap (Square Feet)	Price / Square Feet (Rupiah)	Percentage (%)	Average (%)
February	330000	330000	0	4500	0,00	0,00
March	330000	330000	0	4500	0,00	
April	300000	300000	0	4500	0,00	
May	220000	220000	0	4500	0,00	

The table above shows that the raw material inventory is used entirely, and no raw material is left in the warehouse. This is shown by the calculation of the percentage of 0% and the average value of 0%.

3. Make

   a. Reliability

   - RL.3.49 Schedule Achievement

     Calculation data RL.3.49 Metric can be seen in the table below.

Table 4.20 Calculation of RL.3.49 Metric

Month	Total (Pieces)		Percentage (%)	Average (%)
	On Time Production	Maximum Capacity		
February	330000	330000	100,00	89,39
March	330000	330000	100,00	
April	300000	330000	90,91	
May	220000	330000	66,67	

The table above concludes a decrease in the number of production in the last four periods, a significant decrease occurred in April and May, evidenced by the percentage of each period is 100% in February, 100% in March, 90.91% in April and 66, 67% in May, with the average total of 89.39%.

- RL.3.58 Yield

  Calculation data RL.3.58 Metric can be seen in the table below.

Table 4.21 Calculation of RL.3.58 Metric

Month	Total (Pieces)		Value	Average
	Product without defects	Total Production		
February	313500	330000	0,95	0,95
March	313500	330000	0,95	
April	285000	300000	0,95	
May	209000	220000	0,95	

The table above shows that each period experienced 5% defects in the product, so the results obtained were 0.95 for each period with the average of 0.95. 5% of defects when producing products is a natural defect in the world of poultry farming, this is a risk faced by every farm related to poultry treatment.

- RL.3.31 Compliance Documentation Accuracy

  Calculation data RL.3.31 Metric can be seen in the table below.

Table 4.22 Calculation of RL.3.31 Metric

Month	Total (Pieces)		Percentage (%)	Average (%)
	Products Packed with Complete Documents	Product Packed		
February	313500	313500	100	100
March	313500	313500	100	
April	285000	285000	100	
May	209000	209000	100	

The table above shows that each product packaged has 100% complete documents. This is supported by the acquisition of the percentage of 100% for each period, followed by the average amount of 100%.

b. Responsiveness

The make process has two metrics on the responsiveness attribute, namely RS.3.123 Schedule Production Activities Cycle Time and RS.3.101 Produce and Test Cycle Time. Below is the calculation of both metrics.

Table 4.23 Calculation of RS.3.123 & RS.3.101 Metrics

Metrics	Time	Month (Day)				Average (Day)
		February	March	April	May	
RS.3.123	Manufacturing products On Schedule	36	35	36	35	35,50
RS.3.101	Production and Sample Testing	36	35	36	35	35,50

The table above concludes that the average time needed to manufacture products on schedule is 35.50, and the time required for production and sample testing is 35.50.

c. Asset Management

AM.3.9 Capacity Utilization

AM.3.9 metric is divided into three calculations, the first is the calculation for raw material capacity, the calculation for workers and finally the calculation for machines. The calculation of these three parts can be seen in the table below:

Table 4.24 Calculation of AM.3.9 Actual Output Metric

Month	Actual Output (Pieces)	Maximum Capacity (Pieces)	Value	Average
February	330000	330000	1,00	
March	330000	330000	1,00	0,89
April	300000	330000	0,91	

Month	Actual Output (Pieces)	Maximum Capacity (Pieces)	Value	Average
May	220000	330000	0,67	

The table above explains that there is a decrease in actual output compared to the company's production capacity. The decline occurred in April and May. The results obtained in each period are 1 on February, 1 on March, 0.91 on April and 0.67 for May. The average of the four periods is 0.89. The calculation continues to calculate the production capacity for workers, explained in the table below.

Table 4.25 Calculation of AM.3.9 Workers Metric

Month	Total Workers Used	Total Workers	Value	Average
February	53	66	0,80	0,80
March	53	66	0,80	
April	53	66	0,80	
May	53	66	0,80	

The table above explains in the four periods, the total number of workers used in the production process is only 53 people from a total of 66 people, so the results obtained are 0.80 for all periods with the average value of 0.80. The calculation is continued with the machine capacity calculation used by the company in the table below.

Table 4.26 Calculation of AM.3.9 Machine Metric

Month	Total Machine Used	Total Machine	Value	Average
February	46	46	1	1
March	46	46	1	
April	46	46	1	
May	46	46	1	

The table above shows that all machines are used maximally, this is shown through the results in the value of 1 for all four periods with the average number of 1.

4. Enable

a. sE2 Manage Supply Chain Performance

Enable questionnaire is adjusted with the conditions in PT. ABC (Singaraja unit). Every activity that is not exist in the company will be given with 0 value. The results of the questionnaire assessment are illustrated by below table:

Table 4.27 Questionnaire Calculation of sE2 Manage Supply Chain Performance

Hierarchy	Activity	Information		Likert Scale					Value	Total	Average
		Yes	No								
sE2.1 Initiate Reporting	Reporting Requirements	✓		1	2	3	4	5	3	12	3,00
	Risk Monitoring Requirement	✓		1	2	3	4	5	3		
	Customer Escalation	✓		1	2	3	4	5	3		
	Supplier Escalation	✓		1	2	3	4	5	3		
sE2.2 Analyze Reports	Weekly Reports	✓		1	2	3	4	5	4	16	3,2
	Quarterly Reports	✓		1	2	3	4	5	4		
	Daily Reports		✓	1	2	3	4	5	0		
	Annual Reports	✓		1	2	3	4	5	4		
	Monthly Reports	✓		1	2	3	4	5	4		
sE2.3 Find Root Causes	Detailed Performance Gap	✓		1	2	3	4	5	3	3	3
sE2.4 Prioritize Root Causes	Root Cause	✓		1	2	3	4	5	3	3	3

Hierarchy	Activity	Information		Likert Scale					Value	Total	Average
		Yes	No								
sE2.5 Develop Corrective Actions	Prioritized Root Cause	✓		1	2	3	4	5	3	6	2
	Skills/ Resource Change	✓		1	2	3	4	5	3		
	Network Configuration Change		✓	1	2	3	4	5	0		
sE2.6 Approve & Launch	Corrective Action	✓		1	2	3	4	5	3	3	3

The table above shows that the average acquisition value in every hierarchy are 3 for sE2.1 Initiate Reporting, 3.2 for sE2.2 Analyze Reports, 3 for sE2.3 Find Root Causes, 3 for sE2.4 Prioritize Root Causes, 2 for sE2.5 Develop Corrective Actions and 3 for s E2.6 Approve & Launch.

b. sE4 Manage Supply Chain Human Resources

Enable questionnaire adjusted for the conditions in PT. ABC (Singaraja unit). Every activity that is not exist in the company will be given with 0 value. The results of the questionnaire assessment are shown in the table below.

Table 4.28 Questionnaire Calculation of sE4 Manage Supply Chain Human Resources

Hierarchy	Activity	Information		Likert Scale	Value	Total	Average
		Yes	No				
sE4.1 Identify Skills/ Resource Requirement	Sourcing Plans	✓		1 2 3 4 5	4	20	3,33
	Production Plans	✓		1 2 3 4 5	4		
	Distribution Plan	✓		1 2 3 4 5	4		
	Skills/ Resource Change	✓		1 2 3 4 5	4		
	Return Plans		✓	1 2 3 4 5	0		
	Skill/ Resource Gap	✓		1 2 3 4 5	4		
sE4.2 Identify Available Skills/Resources	Request for Skills/ Resource Data	✓		1 2 3 4 5	4	4	4
sE4.3 Match Skills/ Resources	List of Available Skills/ Resources	✓		1 2 3 4 5	4	20	4
	List of Available and Launch Skills/ Resources	✓		1 2 3 4 5	4		
	Hiring Plan	✓		1 2 3 4 5	4		
	Redeployment Plan	✓		1 2 3 4 5	4		
	Training Plan	✓		1 2 3 4 5	4		
sE4.4 Determine Hiring/ Redeployment	Skill/ Resource Gap	✓		1 2 3 4 5	4	8	4
	Budget - Salaries	✓		1 2 3 4 5	4		

Hierarchy	Activity	Information		Likert Scale					Value	Total	Average
		Yes	No								
sE4.5 Determine Training/	Skill/ Resource Gap	✓		1	2	3	4	5	4	8	4
Education	Budget - Training	✓		1	2	3	4	5	4		
sE4.6 Approve, Prioritize	Proposed Training Plan	✓		1	2	3	4	5	4	4	2
and Launch	Proposed Staffing Plan		✓	1	2	3	4	5	0		

The table above shows that the average value obtained in each hierarchy sE4.1 Identify Skills / Resource Requirements, sE4.2 Identify Available Skills / Resources, sE4.3 Match Skills / Resources, sE4.4 Determine Hiring / Redeployment, sE4.5 Determine Training / Education and sE4.6 Approve, Prioritize and Launch are 3.33, 4, 4, 4, 4, and 2 respectively.

4.2.3.2 Calculation of Final Performance Metrics Value

Calculation of the final value of the performance metrics is the result of the normalization of data processing on each metric using Snorm de Boer normalization. Normalization using Snorm de Boer will produce performance values for each process starting from plan, source, make and enable. The following is the results table of the normalization calculation for plan process.

1. Plan

Table 4.29 Calculation of Snorm de Boer Plan Normalization

Attribute	Metrics	Actual Value (Si)	Minimum Value (Smin)	Maximum Value (Smax)	Characteristics	Snorm	Weight	Snorm X Weight	Total Score	Total
Reliability	RL.3.37	88,83%	80%	100%	Larger is better	44,15	0,5	22,07	42,77	71,38
	RL.3.37	88,28%	80%	100%	Larger is better	41,40	0,5	20,7		
Responsiveness	RS.3.29	1	1	2	Smaller is better	100	0,25	25	100	
	RS.3.13	2	2	3	Smaller is better	100	0,25	25		
	RS.3.28	1	1	2	Smaller is better	100	0,25	25		
	RS.3.27	1	1	2	Smaller is better	100	0,25	25		

The Snorm de Boer normalization calculation table above concludes that the calculation result of supply chain performance values for reliability attributes is 42.775. In contrast, responsiveness attributes produce a performance value of 100. The total value of the process plan performance is 71.38, which included in the Good Condition category. The next table is the results table of the normalization calculation for source process.

2. Source

Table 4.30 Calculation of Snorm de Boer Source Normalization

Attribute	Metrics	Actual Value (Si)	Minimum Value (Smin)	Maximum Value (Smax)	Characteristics	Snorm	Weight	Snorm X Weight	Total Score	Total
Reliability	RL.3.27	0%	0%	10%	Smaller is better	100	0,11	11,11	100	100
	RL.3.18	100%	100%	100%	Larger is better	100	0,11	11,11		
	RL.3.20	100%	100%	100%	Larger is better	100	0,11	11,11		
	RL.3.23	100%	100%	100%	Larger is better	100	0,11	11,11		
	RL.3.19	100%	100%	100%	Larger is better	100	0,11	11,11		
	RL.3.21	100%	100%	100%	Larger is better	100	0,11	11,11		
	RL.3.24	100%	100%	100%	Larger is better	100	0,11	11,11		
	RL.3.25	100%	100%	100%	Larger is better	100	0,11	11,11		
	RL.3.26	100%	100%	100%	Larger is better	100	0,11	11,11		
Responsiveness	RS.3.10	0	0	1	Smaller is better	100	0,50	50,00	100	
	RS.3.8	1	1	2	Smaller is better	100	0,50	50,00		
Asset Management	AM.3.28	0	0	0.001	Smaller is better	100	0,50	50,00	100	
	AM.3.37	0%	0%	0.001%	Smaller is better	100	0,50	50,00		

The Snorm de Boer normalization calculation table above concludes that the calculation results of supply chain performance values for the reliability attribute is 100, the responsiveness attribute produces the performance value of 100, while the asset management attribute obtains

the performance value of 100. The total value of the source process performance is 100, which included in the Excellent category. Excellent results are obtained because PT. ABC (Singaraja unit) very focused on the source process. The source process is a very important process because it will affect the final output of PT. ABC (Singaraja unit). The next table is the results table of the normalization calculation for make process.

3. Make

Table 4.31 Calculation of Snorm de Boer Make Normalization

Attribute	Metrics	Actual Value (Si)	Minimum Value (Smin)	Maximum Value (Smax)	Characteristics	Snorm	Weight	Snorm X Weight	Total Score	Total
Reliability	RL.3.49	89,39%	70,00%	100%	Larger is better	64,63	0,33	21,54	88,21	87,58
	RL.3.58	0,95	0,93	0,95	Larger is better	100	0,33	33,33		
	RL.3.31	100	100	100	Larger is better	100	0,33	33,33		
Responsiveness	RS.3.123	35,50	35	42	Smaller is better	92,86	0,50	46,43	92,86	
	RS.3.101	35,50	35	42	Smaller is better	92,86	0,50	46,43		
Asset Management	AM.3.9	0,89	0,80	1	Larger is better	45	0,33	15,00	81,67	
		1	0,80	1	Larger is better	100	0,33	33,33		
		1	0,90	1	Larger is better	100	0,33	33,33		

The Snorm de Boer normalization calculation table above shows that the results of the calculation of supply chain performance values for the reliability attribute is 88.21, the responsiveness attribute produces the performance value of 92.86. In contrast, the asset management

attribute obtains the performance value of 48.33. The total value of make process performance is 76.47, which included in the Good Condition category. The next table is the results' table of the normalization calculation for enable process.

4. Enable

Table 4.32 Calculation of Snorm de Boer Make Normalization

Process	Hierarchy	Actual Value (Si)	Minimum Value (Smin)	Maximum Value (Smax)	Characteristics	Snorm	Weight	Snorm X Weight	Total Score	Total
sE2 Manage Supply Chain Performance	sE2.1 Initiate Reporting	3,00	2,00	4,00	Larger is better	50,00	0,17	8,33	58,26	79,13
	sE2.2 Analyze Reports	3,20	2,40	3,20	Larger is better	100	0,17	16,67		
	sE2.3 Find Root Causes	3,00	2,00	4,00	Larger is better	50	0,17	8,33		
	sE2.4 Prioritize Root Causes	3,00	2,00	4,00	Larger is better	50	0,17	8,33		

Process	Hierarchy	Actual Value (Si)	Minimum Value (Smin)	Maximum Value (Smax)	Characteristics	Snorm	Weight	Snorm X Weight	Total Score	Total
	sE2.5 Develop Corrective Actions	2,00	1,33	2,68	Larger is better	49,59	0,17	8,26		
	sE2.6 Approve & Launch	3,00	2,00	4,00	Larger is better	50	0,17	8,33		
	sE4.1 Identify Skills/	3,33	2,50	3,33	Larger is better	100,00	0,17	16,67		
sE4 Manage Supply Chain Human Resources	Resource Requirement sE4.2 Identify Available Skills/ Resources	4,00	3,00	4,00	Larger is better	100	0,17	16,67	100,00	

Process	Hierarchy	Actual Value (Si)	Minimum Value (Smin)	Maximum Value (Smax)	Characteristics	Snorm	Weight	Snorm X Weight	Total Score	Total
	sE4.3 Match Skills/ Resources	4,00	3,00	4,00	Larger is better	100,00	0,17	16,67		
	sE4.4 Determine Hiring/Redeployment	4,00	3,00	4,00	Larger is better	100	0,17	16,67		
	sE4.5 Determine Training/ Education	4,00	3,00	4,00	Larger is better	100	0,17	16,67		
	sE4.6 Approve, Prioritize and Launch	2,00	1,50	2,00	Larger is better	100	0,17	16,67		

The Snorm de Boer normalization calculation table above explains the results of calculating the supply chain performance value for the sE2 process Manage Supply Chain Performance is 58.26. In contrast, the sE4 process for Managing Supply Chain Human Resources has the value of 100. The total value of the enable process performance is 79.13 which belongs to the good category

4.2.3.3 Total Supply Chain Performance

The total supply chain performance is the sum of the values in each process that has normalized using Snorm de Boer normalization. All the sum results will be averaged to determine the performance indicators of the company's overall supply chain. The table below shows the total supply chain performance of PT. ABC (Singaraja unit)

Table 4.33 Total Supply Chain Performance

Process	Value	Average
Plan	71,38	84,52
Source	100	
Make	87,58	
Enable	79,13	

Table 4.33 shows that the value of the company's performance indicator is 81.74. These results indicate that the company's supply chain is in the good category.

4.3 Data Processing VOC & SWOT Analysis

4.3.1 Questionnaire Result

To obtain an analysis of market needs for chicken products during the Covid-19 pandemic, questionnaires were distributed to random people around Bali province. The questionnaire was responded by 72 responses. These are the summaries of answers by the respondents:

a. Gender

The data of the questionnaire on Figure 4.6 show us that the majority of the respondent are female with 65% and male with 35% respondents from 72 respondents.

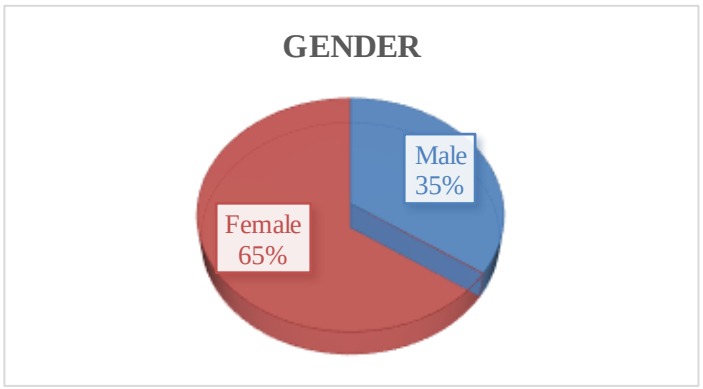


Figure 4.6 Pie Diagram of Respondent Gender

b. Occupation

The data of the questionnaire below show us that 33,3% of the respondent are students, 28% respondents are housewife, 24% respondents are entrepreneur, followed by 12 of government employees, and 3% of others job.

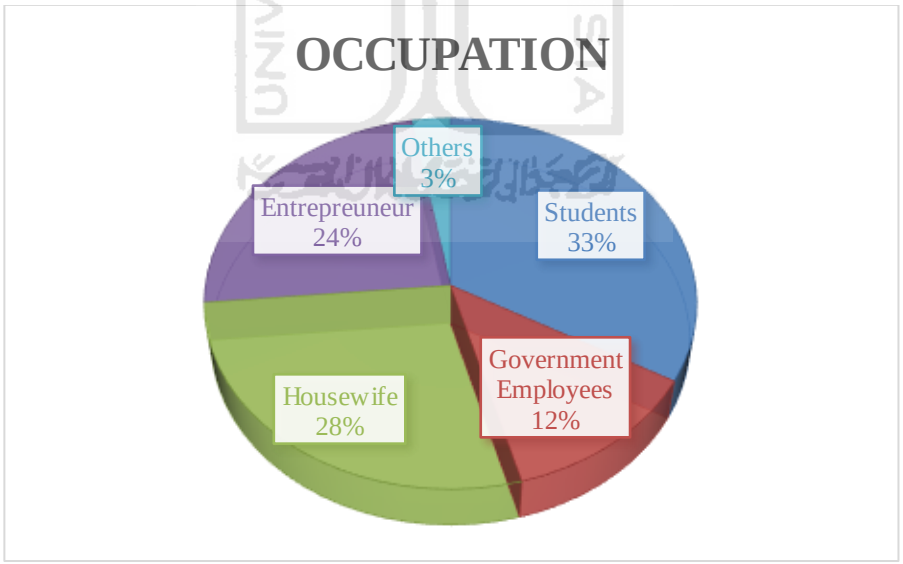


Figure 4.7 Pie Diagram of Respondents Occupation

c. Age

Figure 4.8 shows the total of respondents based on age characteristics. Researchers used age characteristics of students, housewives, and workers. The result are 11

respondents aged 17-21 years, 42 respondents aged 22-30 years, and 19 respondents aged> 30 years.

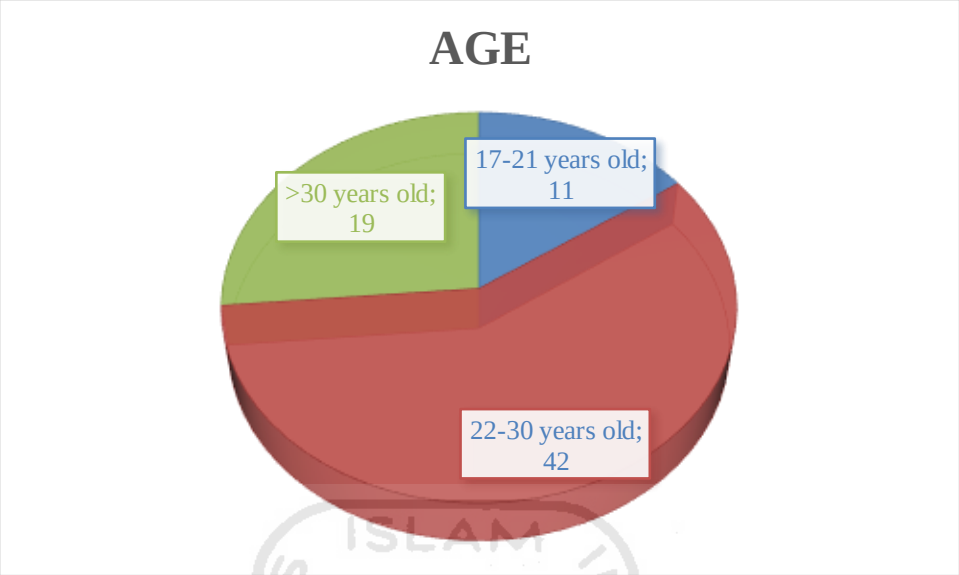


Figure 4.8 Diagram Pie of Respondents Age

d. Voice of Customer

Below is the figure and the table of voice customer about chicken product.



Figure 4.9 Diagram Result of Chicken Purchasing

From the figure 4.9 above, most respondents stated that they often purchasing chicken product. Next, is looking for data on customer' needs for chicken products circulating on the market during the Covid-19 pandemic.

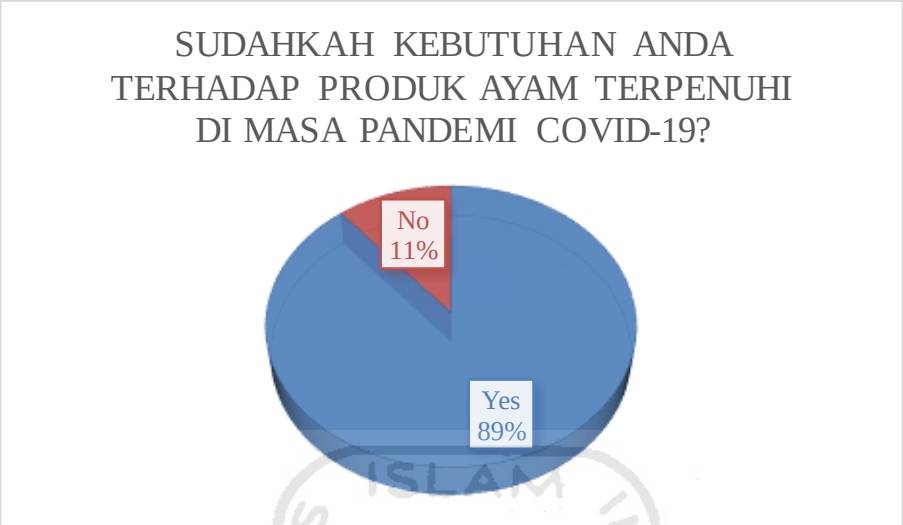


Figure 4.10 Diagram Result of Chicken Need

As we can see at the figure above that the majority of respondents with 89% stated that their needs for chicken products during the Covid-19 pandemic have been met and 11% of respondents stated that their needs for chickens have not been met. This shows that during the Covid-19 pandemic there were some customers whose needs for chickens were still not fulfilled. Next, is to find customer's requirements for chicken products circulating in the market during the Covid-19 pandemic.

Table 4.34 Recapitulation of Customer Needs for Chicken Products

No.	Customer Need	Total of Respondent
1	Separate carcass (chest, wings, thighs and skin)	61
2	Fresh Chicken	54
3	Hygienic	47
4	Affordable price	42
5	Delivery product	41
6	Online order	34
7	Attractive packaging	34

No.	Customer Need	Total of Respondent
8	Skinless chicken carcass	32
9	Original chicken carcass	19

The questionnaire above contains customer needs for chicken products during the Covid-19 pandemic. Table 4.34 above shows how many respondents choose the predetermined specifications. Next is a questionnaire to find customer satisfaction with chicken products on the market during the Covid-19 pandemic.

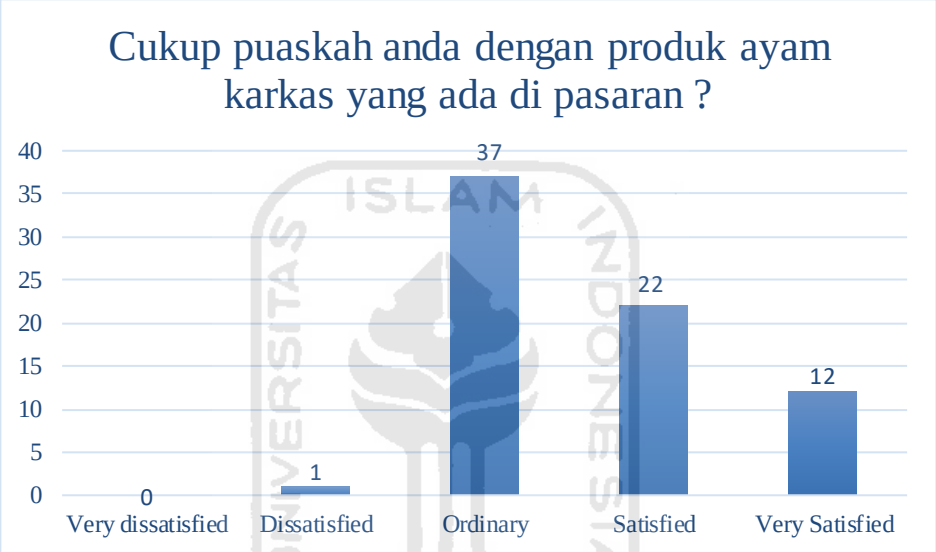


Figure 4.11 Customer Satisfaction Results

Figure 4.11 above shows that the majority of respondents feel ordinary about chicken products on the market today. This shows the need for a strategy to increase customer satisfaction during the Covid-19 pandemic. Next is to look for various customer's complaints about chicken products during the pandemic.

Table 4.35 Recapitulation of Customer Obstacle on Pandemic

No.	Obstacle	Total Respondent
1	No Obstacles	24
2	Reluctant to shop	24
3	Poor quality of product	13
4	Expensive	6
5	Less of Stock	5

Table 4.35 above shows 24 respondents did not have any complaints about chicken products during the pandemic and 48 customers had their own complaints about chicken products including, 24 customers were reluctant to shop on the market due to the complexity of the Covid-19 protocol, 13 respondents had complaints about the poor quality of the chicken. , 6 respondents thought that the price of chicken is getting expensive, and 5 respondents thought that the chicken product on the market is running out quickly. Based on the results of the questionnaire in table 4.35, the problems that responded by respondents about chicken products experience can be used as an opportunity to meet market needs during the Covid-19 pandemic.

4.3.2 Market Strategy Analysis Based on Internal and External Factors

a. Internal Factor Analysis System (IFAS)

IFAS strategy is a strategy that deals with the internal structure that affects the performance of a company or organization in the future. Evaluation of internal factors in a company aims to determine the strengths and weaknesses of the company. Table 4.36 and Table 4.37 below are lists of strengths and weaknesses of chicken products to be made:

Table 4.36 Strength Factor

No	Strength	Code
1	Many variations of carcass chicken (separate carcass, original carcass, skinless carcass)	A
2	Fresh	B
3	Hygienic	C
4	Affordable price	D
5	Attractive packaging	E

Table 4.37 Weakness Factor

No	Weakness	Code
1	Fast rotting flesh	F
2	Requires special treatments (periodic quality inspection)	G

The results of the description of the strengths and weaknesses of the product, then the steps taken are to assign a weight to each factor on a scale of 1.0 (very important) to 0.0 (not important). If the total weights are added together the results obtained are 1.00. Internal factors assign a weighted value based on the impact on strategic factors. Table 4.38 below is the weighting of internal factors.

Table 4.38 Internal Factor Weighting Techniques

Factor	A	B	C	D	E	F	G	TR	Weight
A	X	0	0	0	1	1	1	3	0,14285
B	1	X	1	1	1	1	1	6	0,28571
C	1	0	X	1	1	1	0	4	0,19047
D	1	0	0	X	1	1	0	3	0,14285
E	0	0	0	0	X	1	0	1	0,04761
F	0	0	0	0	0	X	0	0	0
G	0	0	1	1	1	1	X	4	0,19047
			Total					**21**	**1**

After weighting the internal factors of the product to be made, then a rating and scoring for each internal factor should be carried out by giving a rating first using a scale ranging from 4 (very strong) to 1 (very weak). Then, the multiplication result of the weight and rating will produce a score. Table 4.39 below is the result of the table of weights, ratings and scores:

Table 4.39 Internal Weight, Rating, dan Score

Code	Weight	Rating	Score
A	0,14285	3	0,42855
B	0,28571	4	1,14284
C	0,19047	4	0,76188
D	0,14285	3	0,42855
E	0,04761	2	0,09522
	TOTAL		**2,85704**
F	0	2	0

Code	Weight	Rating	Score
G	0,19047	3	0,57141
	TOTAL		**0,57141**
	S-W		**2,28563**

Then, after calculating the value of strengths and weaknesses, the result of the difference between strengths and weaknesses is calculated as 2.28563.

b. External Factor Analysis Strategy (EFAS)

EFAS are external factors that influence the performance of a company or organization. External conditions originated from all aspects such as political, economic, social, cultural factors, the external environment of the company or local government. EFAS will contain an opportunity and a threat. Table 4.40 and Table 4.41 below are the factors opportunity and threat on the product made:

Table 4.40 Opportunity Factor

No	Opportunity	Code
1	Products with lots of customer interest	A
2	There is no online sale of products	B
3	Customers prefer to process chicken carcass by themselves due to health factors	C

Table 4.41 Threat Factor

No	Threat	Code
1	A lot of competitor	D
2	PSBB which limits community activities	E

The results of the description of the opportunity and threat factors on the product are obtained, then the steps are taken to give a weight value to each factor on a scale of 1.0 (very important) to 0.0 (not important). If the total weights are added together the results are obtained as 1.00. Table 4.42 below is weighted on external factors.

Table 4.42 External Factor Weighting Techniques

Factor	A	B	C	D	E	TR	Weight
A	X	1	1	1	1	4	0,4
B	0	X	1	0	1	2	0,2
C	0	0	X	1	1	2	0,2
D	0	1	0	X	0	1	0,1
E	0	0	0	1	X	1	0,1
TOTAL						**10**	**1**

After weighting the external factors on the product, the next step will be made, namely finding a rating, and a score for each external factor by giving a rating first using a scale ranging from 4 (very weak) to 1 (very strong) . Then, the multiplication result of the weight and rating given will produce a score. Table 4.43 below is the results of the table weights, ratings, and scores:

Table 4.43 External Weight, Rating and Score

Code	Weight	Rating	Score
A	0,4	3	1,2
B	0,2	3	0,6
C	0,2	4	0,8
TOTAL			**2,8**
D	0,1	2	0,2
E	0,1	2	0,2
TOTAL			**0,4**
O-T			**2,4**

Then, after calculating the value of opportunities and threats, it is necessary to determine the differences between the two results. The result of the reduction between opportunity and threat is 2.4.

c. SWOT Diagram Analysis

Based on the IFAS and EFAS analysis, this figure will be included in the SWOT analysis diagram. The placement of the difference between strengths and weaknesses is used as the X axis, while the difference between opportunity and threat is the Y axis. Figure 4.12 below is a form of the following SWOT diagram :



Figure 4.12 SWOT Diagram Analysis

In accordance with the SWOT analysis diagram, it is shown that the company is in quadrant 1, which means the company is in a strong and likely area or can be called "progressive". Progressive is the condition of a company that is prime and steady so that the company can expand its business, increase the growth and achieve significant goals.

d. SWOT Metrics

After doing the SWOT mapping, it is necessary to create a SWOT matrix table that contains strengths, weaknesses, opportunities and threats. From this matrix, the company can determine the most profitable strategy from the risks and threats that may occur in the future. In addition, companies can also improvise and improve by

identifying their strengths, weakness opportunities, weaknesses and threats. Things that need to be considered in strategy formulation are strategies that utilize (strength and opportunity) and reduce (weakness and threat) so that the company can achieve its goals. Table 4.44 below is a SWOT analysis matrix which can be seen as follows:

Table 4.44 Metrics of SWOT Analysis

IFAS / EFAS	STRENGTHS (S)	WEAKNESS (W)
	Strategi S-O	**Strategi W-O**
OPPORTUNITIES (O)	Providing fresh carcass chicken products with many variations so that buyers can choose carcass chicken products according to what they need. The processing of carcasses is carried out in a hygienic manner and is packaged in a neat packaging to show the impression of a quality carcass chicken product. In addition, providing a neat and clean sales place coupled with an online order system and delivery service will be a good strategy to increase product sales.	In minimizing the weaknesses in the product, what can be done is to use a cooling machine to maintain the freshness of the chicken and apply SOP to chicken management so that the chicken remains hygienic and of good quality.
	Strategi S-T	**Strategi W-T**
THREAT (T)	Creating a strategy by providing carcass chicken products with many variations, fresh, affordable	Minimizing product weaknesses by using a cooling machine to maintain the freshness of

IFAS / EFAS	STRENGTHS (S)	WEAKNESS (W)
	prices, hygienically processed and neatly packaged. By carrying out this strategy, the product can overcome threats that come from outside such as the existence of similar competitors. The implementation of PSBB during the Covid-19 pandemic can be overcome with an online marketing system and delivery service so that customers have the convenience of obtaining carcass chicken products.	chicken products coupled with the implementation of SOPs to maintain the cleanliness and quality of chicken. This can increase customer confidence and overcome external threats such as the number of competitors.

CHAPTER V

DISCUSSION

5.1 Discussion

5.1.1 SCOR 12

Based on the results of performance calculations in 37 metrics at PT. ABC (Singaraja unit), the calculation result obtained the process plan score with six metrics is 71.38, which means the company's plan process in good category. The source process with thirteen metrics gets score of 100, this value indicates that the company's source process in the excellent category, the make process with six metrics gets score of 87.58 which shows the make process has a good category, while the enable process with twelve metrics gets score of 79.13 which means the enable process is in good category. This result shows that each process is still in the category of safe and good, followed by the total overall final performance score which obtained 84.52 score. 84.52 score indicates that the overall performance of the company in the good category.

However, the calculation of performance metrics at PT. ABC (Singaraja unit) still has some unsatisfactory performance metrics, so it is necessary to make improvements to these performance metrics. The tool used to help analyzing supply chain performance metrics at PT. ABC (Singaraja unit) is a Traffic Light System. Traffic Light System is a tool in quality inspection that uses red, yellow and green color indicators to do analysis. According to Tannady (2015), the red indicator shows that the performance is unsatisfactory with a snorm value below 60%, yellow with a threshold value of 60% to 80% which means the company's performance has not achieved. The company must be careful regarding to this value. At the same time, green indicator has Snorm value above 80%, which means the company's performance is in the good category.

- Snorm < 60% : Red Light
- 60% < Snorm < 80% : Yellow Light
- 80% < Snorm : Green Light

The table below shows the color indicator on the traffic light system that applied to the performance value of each metric at PT. ABC (Singaraja unit).

Table 5.1 Traffic Light System Result

Process	Metrics	Actual Value (Si)	Minimum Value (Smin)	Maximum Value (Smax)	Snorm
Plan	RL.3.37	88,83%	80%	100%	44,15
	RL.3.37	88,28%	80%	100%	41,40
	RS.3.29	1	1	2	100
	RS.3.13	2	2	3	100
	RS.3.28	1	1	2	100
	RS.3.27	1	1	2	100
Source	RL.3.27	0%	0%	10%	100
	RL.3.18	100%	100%	100%	100
	RL.3.20	100%	100%	100%	100
	RL.3.23	100%	100%	100%	100
	RL.3.19	100%	100%	100%	100
	RL.3.21	100%	100%	100%	100
	RL.3.24	100%	100%	100%	100
	RL.3.25	100%	100%	100%	100
	RL.3.26	100%	100%	100%	100
	RS.3.10	0	0	1,0	100
	RS.3.8	1	1	2	100
	AM.3.28	0	0	0	100
	AM.3.37	0,00%	0%	0	100
Make	RL.3.49	89,39%	70,00%	100%	64,63
	RL.3.58	0,95	0,93	0,95	100
	RL.3.31	100	100	100	100
	RS.3.123	35,50	35	42	92,86
	RS.3.101	35,50	35	42	92,86
		0,89	0,80	1	45
	AM.3.9	1	0,80	1	100
		1	0,90	1	100

Enable	sE2.1	3,00	2,00	4,00	50,00
	sE2.2	3,20	2,40	3,20	100
	sE2.3	3,00	2,00	4,00	50
	sE2.4	3,00	2,00	4,00	50
	sE2.5	2,00	1,33	2,68	49,59
	sE2.6	3,00	2,00	4,00	50
	sE4.1	3,33	2,50	3,33	100
	sE4.2	4,00	3,00	4,00	100
	sE4.3	4,00	3,00	4,00	100
	sE4.4	4,00	3,00	4,00	100
	sE4.5	4,00	3,00	4,00	100
	sE4.6	2,00	1,50	2,00	100

a. Plan

Based on the performance metrics calculation in the plan process, there are four metrics with green indicator and two metrics with red indicators such as RL.3.37 Forecast Accuracy (Source) with score of 44.15 and RL.3.37 Forecast Accuracy (Demand) with score of 41.40, which means the performance of both metrics is unsatisfactory. This problem shows that the company is unreliable in predicting the procurement of raw materials (source) and predicting product demand during the Covid-19 pandemic. The impact of the company's unreliable forecasting is the possibility of overproduction occurrences, which will cause a high supply of products followed by a decrease in broiler chicken prices on the market. Therefore, it is necessary to update the company's forecasting method and create a new customer for chicken product to solve the problem.

PT. Japfa Comfeed Indonesia as the main company should fix the problem on product demand forecasts to avoid big losses that will occur if this problem is not resolved immediately. Qualitative forecasting method is a recommended method to be used during the Covid-19 pandemic, since it is more subjective and this method influenced by emotions, education, intuition and expert experience. The advantage of using qualitative forecasting methods is the ability of these fore casting methods to predict changes in trends based on the experience and knowledge of senior experts who have worked longer in dealing with problems and managing the company. Also,

qualitative methods have flexibility in determining product demand forecasting. Qualitative forecasting methods consist of subjective assessment methods, exploration methods and normative approaches. However, forecasting with the subjective valuation method approach is recommended for use because this method is faster and easier to use, there is no need to use complicated statistical data, and this method combines various perspectives of management and market participants. Decisions about forecasting subjective assessment methods can be taken from a variety of techniques, including,

1. Combined salesforce

   Forecasting results are obtained based on the views of salespeople and sales management who are more aware of market conditions.

2. Consumer surveys

   In this technique, the company takes data by conducting a direct survey of customers via telephone, interview or questionnaire distribution. The data obtained will be analyzed to do forecasting in the future.

PT. Japfa Comfeed Indonesia, as the holder of full decision control, should form a special team to analyze product demand forecasts for each subsidiary company using a combined salesforce and / or consumer survey. The use of salespeople who interact directly with customers aims to analyze daily product requests, so that the analysis can be processed into information to make decisions in predicting the number of product requests in the next period, while the consumer survey aims to collect data on customer needs that can be used as a reference for taking decisions and designing strategies in forecasting product demand.

In addition, planning to create new customer segmentation for chicken products needs to be done to increase sales during the Covid-19 pandemic. Planning to create new customer segmentation is carried by collecting customer needs and then launching products to meet their needs, so that the possibility of overproduction, high supply of products and decreases of price of chicken products will be resolved by meeting the customer needs through new customer segmentation. A SWOT analysis is necessary to determine internal and external analysis that will support the planning of new customer segmentation.

b. Source

All performance results in the source process get green indicator because all scores for the snorm are 100. These results indicate that the source process at the company is excellent. PT ABC (Singaraja unit) very focused on the source process because the company's final production is very dependent on source management. The seriousness of the company in managing the source is evidenced by the value of Snorm obtained.

c. Make

The results of performance measurement in the make process show that there are six metrics with green indicator, one metric with yellow indicator and one metric with red indicator. RL.3.49 Schedule Achievement (the number of products produced on time) gets a yellow indicator with a score of 64.63. In contrast, A.M 3.9 Capacity Utilization (Actual output) gets a red indicator with a score of 45. The yellow indicator on RL.3.49 Schedule Achievement shows that the company does not maximize their on-time capacity production, this happens because the company cuts DOC (Day Old Chicken) raw materials, so, the company's production capacity decreases. Meanwhile, the on-time production of company is high. A.M 3.9 Capacity Utilization (Actual Output) gets a score of 45 with a red indicator indicating that the company did not utilize the asset of the maximum production capacity to produce products for a period. Not utilizing the capacity of on-time production and company assets to produce the maximum product will result in waste in the cost of poultry farm care and machine maintenance. To minimize the waste that occurs in the company, it is proposed improvement by implementing lean manufacturing. Lean manufacturing is one of the methods used to eliminate waste in production. The advantages of using lean are reducing waste, maximizing equipment usage, and increasing process capability. The VSM (Value Stream Mapping) method will be used to understand the flow of material and information in the company's business processes and visualized in the form of a flowchart so that it is easy to analyse. Then it is proceeded by identifying eight wastes to eliminate the waste that occurs. The application of lean manufacturing is expected to assist companies in reducing company production costs.

d. Enable

In measuring the performance of the enable process metrics, there are seven metrics with green indicator and five red indicator metrics such as sE 2.1 Initiate Reporting with 50 scores, sE 2.3 Find Root Causes with 50 scores, sE 2.4 Prioritize Root Causes with the acquisition of a score of 50, sE 2.5 Develop Corrective Actions with the acquisition of a score of 49.59, and sE 2.6 Approve and Launch with 50 scores. The red indicator on each metric shows that PT. ABC (Singaraja unit) workers are less capable and still need coordination once they face a problem. Based on those results, the company should improve its worker's skills by holding a training event and knowledge transfer sessions. Training events and knowledge transfer sessions will give new insights and references for workers to broaden their knowledge in solving and dealing with problems that arise in their work. Cooperating with other companies in conducting training and knowledge transfer can be an option for companies to develop workers' skills and knowledge for the company's progress.

5.1.2 Voice of Customer and SWOT Analysis

Based on questionnaires that had distributed shows that during the Covid-19 pandemic, the satisfaction of chicken products has not increased in the market, as evidenced by 37 respondents feel ordinary about chicken products which they buy in the market. In addition, customers feel that they have many obstacles to the chicken product access, including the PSBB policy that make the limited space for movement which makes customers reluctant to shop, limited stocks and poor product quality on the market. This problem raises various specifications for customer requests for chicken products, including customers asking for more varied variations of carcass chicken, fresh product, hygienic carcass chicken products, and online sales to delivery services. These customer demand specifications can be an opportunity for the company to increase sales of chicken product.

Analyzing marketing strategies in increasing sales of chicken products at PT. ABC (Singaraja unit) followed by the use of a SWOT analysis. SWOT analysis consists of internal factors and external factors. It can be seen that the company's internal factors have a score of 2.28, a score that describes a strong internal company position. On the external factors the company has a score of 2.4, this score illustrates that the company can respond to existing opportunities and is sufficiently able to avoid threats that exist in

the industrial market. In accordance with the SWOT analysis diagram shows that the company is in quadrant 1, which means that the company is in a strong and likely area or can be called progressive. Progressive product analysis conditions can be used by companies to respond to market desires in creating online product sales and supported by product delivery services to overcome problems during a pandemic where people are encouraged to stay at home. In addition, maintaining good quality of products and attractive packaging can be done by companies to increase customer interest in PT. ABC (Singaraja unit) product. In the SWOT matrix, this strategy lies in the SO strategy where the company can take advantage of the product variants and product quality that will create a new customers, maintain customer trust to increase company sales and make good strategy by involving the use of technology and carrying out targeted promotions.

CHAPTER VI

CONCLUSION & SUGGESTION

6.1 Conclusion

Based on data processing and analysis conducted, the conclusion are:

1. Performance measurement using SCOR 12 is carried out on four business processes at PT. ABC (Singaraja unit) such as plan process, source, make and enable. The deliver and return process are not employed since those processes are not in accordance with the company's business processes. The following analysis:
   a. Plan

      The plan process obtains a performance score of 71.38 out of total 6 metrics measured. A score of 71.38 shows that the process plan is in the good category. By using the traffic light system tools, it could be notified that the four metrics get a green indicator, which means it is in the good category. However, there are two metrics with red indicator, which are RL.3.37 Forecast Accuracy (Source) & RL.3.37 Forecast Accuracy (Demand) and these two metrics need to be improved.
   b. Source

      The source process obtains a performance score of 100 out of total 13 metrics measured for performance. A score of 100 explains that the source process is in the excellent category. The Source process has excellent performance.
   c. Make

      The make process obtains a performance score of 87.58 out of total 8 metrics measured. A score of 87.58 shows that the make process is in the good category. By using the traffic light system tools, it is known that six metrics are on the green indicator, one metric RL.3.49 Schedule Achievement gets a yellow indicator and one metric A.M.3.9 Capacity Utilization (Actual Output) gets a red indicator.

d. Enable

The enable process obtains a performance score of 79.13 out of total 12 metrics measured. A score of 79.13 indicates that the enable process is in the good category. By using the traffic light system tools, it is known that seven metrics get a green indicator, and five metrics get a red indicator. The five red indicators are sE 2.1 Initiate Reporting with 50 scores, sE 2.3 Find Root Causes with 50 scores, sE 2.4 Prioritize Root Causes with the acquisition with the score of 50, sE 2.5 Develop Corrective Actions with the acquisition with the score of 49.59, and sE 2.6 Approve and Launch with 50 scores that indicate the necessity of improvements to enhance the company's supply chain performance.

2. Improvements to the yellow and red performance indicators must be made to improve the performance of the company's supply chain. Below are recommendations for improvement for each problematic indicator.

   a. RL.3.37 Forecast Accuracy (Source and Make)

   Facing the Covid-19 pandemic, the company needs to update the forecasting method used. Qualitative forecasting method is a recommended method to be used during the Covid-19 pandemic because this method is more subjective and influenced by emotions, education, intuition and expert experience. In addition, the company need to create new segmentation of customer to increase the sales of chicken product by fulfill the market and customer demands.

   b. RL.3.49 Schedule Achievement

   Basically, the company always utilizes capacity on-time production to the maximum under normal conditions (before the Covid-19 pandemic). However, when the Covid-19 pandemic occurs, product demand decreases so that the company's production also decreases. A decrease in product production results in an on-time production capacity not being utilized to the maximum and leading to waste. To minimize waste, it is necessary to apply lean manufacturing using the VSM method to identify business processes and eliminate waste in order to reduce company production costs.

   c. A.M 3.9 Capacity Utilization (Actual Output)

   In order to eliminate waste and save the cost because the company does not utilize the usage of the company's production capacity assets as maximum, lean manufacturing is proposed by using the VSM (Value Stream Mapping) method.

Eliminating waste by lean methods helps companies to reduce production costs, maintenance costs for machinery and other facilities. So that the company's business processes are more efficient and the company's production facilities can be utilized optimally.

d. sE2 Manage Supply Chain Performance

sE 2.1 Initiate Reporting, sE 2.3 Find Root Causes, sE 2.4 Prioritize Root Causes, sE 2.5 Develop Corrective Actions, and sE 2.6 Approve and Launch have the same problem that workers are less able to make decisions and require coordination regarding problem solving. Facing this problem, companies need to hold regular training and transfer knowledge. Training and transfer of knowledge are held with the aim of providing new knowledge, skills and references for workers in dealing with problems that arise at work. Training and knowledge transfer can be developed by conducting training and knowledge transfer with other companies, or with other divisions within the company.

3. Through the distribution of customer needs questionnaires, the results show that the carcass chicken product specifications that are interested by customers the most are carcass chicken products with many variations which are fresh, clean and hygienic, with affordable prices, neat packaging and accommodated with online sales. While, the strategy that can be used is the S-O strategy, which is to provide fresh carcass chicken products with many variations so that buyers can choose carcass chicken products according to what they need. The processing of carcasses is carried out in a hygienic manner and is packaged in a neat packaging to show the impression of a quality carcass chicken product. In addition, providing a neat and clean sales place coupled with an online order system and delivery service will be a good strategy to increase product sales during the Covid-19 pandemic where people do not have much outside activities due to PSBB.

6.2 Suggestion

Suggestions given to companies and further research are as follows:

1. Company
   a. Companies make improvements to problematic metrics by applying qualitative forecasting methods to improve forecasting performance, implementing lean

manufacturing to eliminate waste in the company's production process and providing training and knowledge transfer to improve employee skills.

b. The company is expected to maintain an excellent value supply chain performance to optimize customer satisfaction.

c. Companies need to create carcass chicken products to increase company sales by implementing online sales and delivery services

2. Further Research

For further research, it is expected that there will be a simulation related to improvements which will be used as a comparison of results before and after the implementation of the proposed improvement.

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