The Use of Supply Chain Risk Management Process (SCRMP) in Third-Party Logistics Industry: A Case Study in Indonesia

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Abstract

Globalization brought new opportunities to logistics providers worldwide, especially in the Mexico, Indonesia, South Korea, and Turkey (MIST) countries. However, this attractive opportunity also came with high risk due to the complexity of the global supply chain. Third-party logistics providers need to be prepared to minimize the risks by utilizing risk management to ensure a smooth supply chain operation. This case was conducted with a major Indonesian third-party logistics (3PL) provider, utilizing the Supply Chain Risk Management Process (SCRMP) to control and monitor all risks that can arise in the company. The structure of the method can be divided into four phases: risk identification, risk measurement/risk assessment, risk evaluation, and risk mitigation/contingency plans. The purpose of this research is to validate how the SCRMP concept performs in challenging contexts such as the Indonesian 3PL industry. The study also bridged the theoretical-practical gap by helping practitioners gain valuable insights to manage risks in the company and provided appropriate risk mitigation. The results showed that there are seven unacceptable risks requiring risk mitigation and control. Risk mitigation strategies were then recommended, based on the risks that were categorized as the most critical and unacceptable. The recommendation is expected to reduce the risks that occur in the Indonesian cold chain.

**Keywords:** risk management, supply chain risk management process, third-party logistics providers

INTRODUCTION

Globalization has introduced worldwide opportunities for logistics providers. Indonesia, in particular, has gained direct benefits from global trade since it is one of the MIST countries. These countries are known as upcoming global trade powerhouses after the Brazil, Russia, India, and China (BRICS) countries. New technology, open-sourcing knowledge, and a global lifestyle have fueled new logistical opportunities for both domestic and international trade in Indonesia. Recently, the number of logistics providers in Indonesia is growing, especially for cold supply chains that deliver agricultural and fishery products (Gandi, 2006). However, new opportunities also present various inevitable risks for supply chain/logistics operations. To embrace these opportunities, the Indonesian 3PL providers need to be prepared to face these risks wisely. The purpose of this study is to utilize the SCRMP to unearth the risk involved in the 3PL industry in Eastern Indonesia.

The primary contribution of this study is to help strengthen the body of knowledge by bridging the gap between theory and practice. This study not only unearthed a few new risks Indonesian 3PL logistics industry but also promoted a practitioner-level theory to help local 3PL providers in this region gain new business insights (Toffel, 2016; Garver, 2019; Zinn & Goldsby, 2017; Goldsby & Zinn, 2019). Why Indonesia? Indonesia provided unique and challenging contexts to study risk management in logistics for the following reasons. First, since the dawn of the maritime era, Indonesia has been well-situated on a major shipping route. Second reason, Indonesia has a large economy with a population of nearly 300 million. Third,
Indonesia is one of the primary influencers in the ASEAN economy, which represents the 6 largest economies in the world. Fourth, since it sits in the ring of fire, Indonesia is also prone to natural disasters from unstable tectonic plates. Fifth, tropical monsoons often disrupt logistical operations. Sixth, the archipelago landscape provides a uniquely high level of complexity for multimodal logistics operations. In brief, Indonesia is a major global logistics hub and it provides various angles of risk to thoroughly test the SCRMP concept.

The case was conducted with an Indonesian third-party logistics provider that is engaged in cold chain logistics, and located in Surabaya, Eastern Java, Indonesia. This company specializes in providing transportation services, both locally and internationally, by using proper temperature control systems, such as reefer containers. This logistics company delivers food products, such as seafood and temperature controlled meals, across Eastern Indonesia for the food companies they serve. Despite having much experience in cold chain transportation, the company must keep improving its business performance to compete with other companies (Pradita & Ongkunaruk, 2019). As global competition becomes more challenging and supply chains become increasingly complex, the possibility of failures in the supply chain can arise due to the risks. Therefore, companies need to plan for supply chain risks that may occur, and design effective mitigation concepts to lessen supply chain risk (Chopra & Sodhi, 2004). The framework for supply chain risk management has been described by Manuj & Mentzer (2008), which includes risk identification, risk assessment and evaluation, determination of suitable risk management strategies, implementation of supply chain risk management strategies, and mitigation of supply chain risks. By implementing effective risk management, third party logistics providers can maintain their position in increasingly competitive markets (Manotas-Duque, Osorio-Gómez, & Rivera, 2016).

METHODS

Tummala & Schoenherr (2011) proposed a conceptual framework and approach, called the SCRMP, for economical risk management in a supply chain. Their proposed method is utilized in this research. Information from third-party logistics providers was obtained by conducting in-depth interviews and questionnaires with the sales and marketing department, operational department, human resources department, financial department, and customer service department. The SCRMP questionnaire consists of risk identification, risk measurement, risk assessment, and risk planning. The structured approach of the SCRMP was divided into SCRMP Phase I and Phase II.

SCRMP Phase I

SCRMP Phase I was done as follows:

1. Risk Identification

Risks were identified based on the exploration and analysis of the situation in the company. Risk categories in this research consist of demand risk, delay risk, disruption risk, inventory risk, operational risk, supply risk, financial risk, system risk, sovereign risk, transportation risk, and marketing risk.

2. Risk Measurement

The consequence severities and indexes were classified into negligible (Index 1), marginal (Index 2), critical (Index 3), and catastrophic (Index 4). The detail of the qualitative description in risk measurement is described in Table 1. Note that the level of severity can be changed to three or five depending on a decision maker.

3. Risk Assessment

Risk probability categories and indices were classified into extremely rare (Index 1),

| Severity level | Qualitative description | Index | HTP code* |
|----------------|-------------------------|-------|-----------|
| Catastrophic   | Operations stopped for more than a month due to the lack of containers with zero safe stock levels | 4     | A         |
| Critical       | Slow down the process for one week due to lack of containers with zero safety stock levels | 3     | B         |
| Marginal       | Service levels decrease with depleting safety stocks | 2     | C         |
| Negligible     | Service levels not affected due to adequate safety stocks | 1     | D         |

*Hazard Totem Pole Code
The Use of Supply Chain...

Table 2. Probabilities categories and indexes

| Probability level | Qualitative Description | Index | HTP code |
|-------------------|-------------------------|-------|----------|
| Often             | Once per day            | 4     | J        |
| Infrequent        | Once per week           | 3     | K        |
| Rare              | Once per month          | 2     | L        |
| Extremely Rare    | Once per year           | 1     | M        |

Table 3. Risk exposure value

| Severity level | Probability of occurrence | Often (4) | Infrequent (4) | Rare (2) | Extremely Rare (1) |
|----------------|---------------------------|-----------|----------------|----------|--------------------|
| Catastrophic   |                           | 16        | 12             | 8        | 4                  |
| Critical (3)   |                           | 12        | 9              | 6        | 3                  |
| Marginal (2)   |                           | 8         | 6              | 4        | 2                  |
| Negligible (1) |                           | 4         | 3              | 2        | 1                  |

Figure 1. Risk Acceptance Level Determination (Tummala & Schoenherr, 2011)

SCRMP Phase II

SCRMP Phase II was done as follows:

1. Risk Evaluation

In this step, the Risk Exposure Value will be computed as the probability level multiply by severity level. Risk ranking was defined based on risk consequences index and risk probability index. The risk exposure values are illustrated in Table 3.

2. Determine Risk Acceptance Level

After calculating the risk exposure value, then it will be categorized in the risk acceptance level where its criteria depend on a decision maker. There are three levels: Unacceptable, Tolerable and Acceptable (Figure 1). First, the Unacceptable level requires the decision maker takes action such as to treat, transfer or terminate risks. Second, the tolerable level needs that the decision maker to keep monitoring the risks. Finally, the Acceptable level requires the decision maker to take the risk.

3. Determine Cost of Risk Mitigation and Contingency Plans

There are four level of cost category system derived from the literature review and interviews with executive practitioners in each company and department. Each category was associated with a cost index and a Hazard Totem Pole (HTP) code, as shown in Table 4. Note that the cost categories can be changed to three or five depending on the decision maker.

Table 4. Implementation cost categories for risk response action plans

| Cost Categories | Implementation Costs (US$) | Costs Index | HTP Code |
|-----------------|-----------------------------|-------------|----------|
| Substantial     | 10,000 – 100,000            | 1           | S        |
| High            | 1,000 – 10,000              | 2           | R        |
| Low             | 100 – 1,000                 | 3           | Q        |
| Trivial         | < 100                       | 4           | P        |

SCRMP Phase III

Phase III is composed of risk control and monitoring. First, construct the risk mapping...
(Blahut, Glade, & Sterlacchini, 2014) which categorize the type to risks in four categories: R1: Moderate risk where risks can be taken, R2: Medium risk where risks should be treated, R3: High risk where risks should be transferred to the other company such as insurance company, R4 Critical risk where risks must be terminated. The risk mapping was considered by authors with the approval of the company. Risk mitigation strategies were proposed by literature reviews and expert opinions for the most critical risks.

RESULTS AND DISCUSSION

SCRMP Phase I
Risk Identification

The risks were identified based on in-depth interviews and questionnaires with key actors in each third-party logistics provider. This enabled us to understand the risk categories as well as the events and conditions that drive them. Table 5 describes the detail of risk triggers in each risk category.

| Risks Category | Risks Code | Risks | Risks Code | Risks |
|----------------|------------|-------|------------|-------|
| Demand Risks   | R1         | Lack of strategic forecast | R2     | High fluctuated demand |
| Delay Risks    | R3         | Effect of unpredictable climate change | R7     | Shipping cancellation from local carriers |
|                | R4         | Shipping document process (quarantine) | R8     | Transportation breakdown |
|                | R5         | Port capacity and port congestion | R9     | Excessive handling due to transportation changes |
|                | R6         | Customs clearance delay | R10    | Natural disasters |
| Disruption Risks | R11      | War and terrorism | R13    | Single source of a local carrier for some route |
|                | R12        | Labor conflicts | R14    | Capacity and responsiveness of alternate carriers |
| Inventory Risks | R15       | Costs of holding inventories | R18    | Vendor fulfillment errors |
|                | R16        | Demand and supply uncertainty | R19    | Container shortage |
|                | R17        | A high rate of product obsolescence | R20    | Damage product from accident |
| Operational Risks | R21    | Vehicle condition | R24    | Generator set condition |
|                | R22        | Inadequate truck | R25    | Staff performance and responsibility |
|                | R23        | Container condition | R26    | No temperature record |
|                | R24        | Cost of holding inventories | R27    | No temperature control during loading |
| Supply Risks   | R35        | High interest rates | R38    | Fraud |
|                | R36        | Interest rate volatility | R39    | Long credit customer |
|                | R37        | The exchange rate fluctuates | R40    | Container investment plan |
| System Risks   | R41        | Information infrastructure breakdowns | R44    | Breakdown custom system |
|                | R42        | Lack of effective system integration or extensive system networking | R45    | Lack of order documents |
|                | R43        | Lack of compatibility in IT platforms among supply chain partners | R46    | Regional instability |
| Sovereign Risks | R47       | Communication difficulties | R49    | Loss of control |
|                | R48        | Government regulations | R50    | Intellectual property breaches |
| Transportation Risks | R51    | Manual transportation scheduling (lack of computerization) | R55    | Higher costs of transportation |
|                | R52        | Port strikes | R56    | The high cost of the additional plug at a container yard |
|                | R53        | Shipping error | R57    | Lack of real-time tracking |
|                | R54        | Late deliveries | R58    | Overcapacity on the ship |
| Marketing Risks | R59       | Increasing the number of competitors | R60    | The decrease in the number of customers |
Risk Measurement
This categorization is adjusted to the impact caused by the occurrence of the risk. Risks that have a catastrophic impact are container shortage (R19), vehicle condition (R21), inadequate truck (R22), container condition (R23), generator set condition (R24), vendor local carriers bankruptcy (R32), and port strikes (R52).

Risk Assessment
Risks that often occur are the lack of strategic forecast (R1), port capacity and port congestion (R5), demand and supply uncertainty (R16), vendor fulfillment errors (R18), manual transportation scheduling (R51), late deliveries (R54), higher cost of transportation (R55), high cost of additional service plugs at container yards (R56), and overcapacity on the ship (R58). The most common risk is transportation risk caused by the performance of the vendor (shipping line company) and the port section.

SCRMP Phase II
Risk Evaluation
Risk exposure value was identified based on the severity level and probability of occurrence level (Tummala & Schoenherr, 2011). In this research, risks with an unacceptable exposure level are given more control and monitoring from the company. Many risks that have a high exposure value come from the category of demand risk, delay risk, inventory risk, and transportation risk, which are the main foundations of the company's business.

Determine Risk Acceptance Level
In this case, risks with values range within 16 and 11 are classified in the most critical class (Unacceptable risk: U). Risks range within 10 and 6 are categorized in the next-most critical class (Tolerable risk: T). Risks range within 5 and 1 are in the negligible class (Acceptable risk: A).

Determine Cost of Risk Mitigation and Contingency Plans
The risk mitigation costs of all risks are determined based on the criteria in Table 4. The cost determination from the experts in the company. The results are shown in Table 6.

Risk Mitigation and Contingency Planner
For each risk level, the cost of the category is determined based on the company's experience in handling the problem. Existing mitigation cost indicates the level of risk that might occur in the company.

Determine Hazard Totem Pole (HTP)
To construct the Hazard Totem Pole, we first created a table with the sum of three risk indices (Risk Measurement, Risk assessment, and Risk Cost) for each risk code. For example, for R1, the HTP is equal to 3+4+3 = 10 and the risk code is BJQ. The results are shown in Table 6. Then, the total HTP index for each item was ranked from highest to lowest. Next, the corresponding three risk codes were added to each line and calculated with the cumulative risk factor code and the cumulative risk control code. Through this HTP diagram, the most significant risk is at the top of the diagram. The HTP diagram provides an effective decision tool by easily relating information to managers who provide risk mitigation responses or actions.

The top HTP index represents tragic consequences that can be removed for a small amount of money. The effect of the sorted risk factors diminishes as we go down the HTP diagram. The HTP diagram in Table 7 shows that the largest total HTP index is 10 with the risk factor code BJQ and AKQ. There are 7 risks with the code BJQ and AKQ, with a cumulative risk control cost of US$2,733. Risk factors with a code of BJQ (or 3, 4, 3) are associated with a “critical” consequence severity and an “often” probability of occurrence. These factors involve a cost between US$100 – US$1,000 for the implementation of risk reduction action plans. Risks with the BJQ code are a lack of strategic forecast (R1), port capacity and port congestion (R5), demand and supply uncertainty (R16), manual transportation scheduling (lack of computerization) (R51), late deliveries (R54), and overcapacity in the ship (R58). Similarly, risk factors with a code of AKQ (or 4, 3, 3) are associated with a catastrophic consequence severity, an infrequent probability of occurrence, and involve an implementation cost to consist of the identified risk factor between US$100 to US$1,000. The risk of container shortage (R19) is a risk with the AKQ
| Risk Code | Risk Measurement | Risk Assessment | Risk Evaluation | Risk Cost | Total HTP |
|-----------|------------------|-----------------|-----------------|-----------|-----------|
|           | Index Code       | Index Code      | Exposure Level  | Index Code |          |
| R1        | 3 B 4 J          | 12 U            | 3 Q            | 10        |
| R2        | 2 C 3 K          | 6 T             | 2 R            | 7         |
| R3        | 2 C 3 K          | 6 T             | 3 Q            | 8         |
| R4        | 2 C 2 L          | 4 A             | 4 P            | 8         |
| R5        | 3 B 4 J          | 12 U            | 3 Q            | 10        |
| R6        | 3 B 3 K          | 9 T             | 3 Q            | 9         |
| R7        | 3 B 3 K          | 9 T             | 3 Q            | 9         |
| R8        | 3 B 3 K          | 9 T             | 2 R            | 8         |
| R9        | 3 B 3 K          | 9 T             | 2 R            | 8         |
| R10       | 3 B 1 M          | 3 A             | 2 R            | 6         |
| R11       | 2 C 1 M          | 2 A             | 3 Q            | 6         |
| R12       | 2 C 1 M          | 2 A             | 3 Q            | 6         |
| R13       | 3 B 2 L          | 6 T             | 2 R            | 7         |
| R14       | 3 B 3 K          | 9 T             | 3 Q            | 9         |
| R15       | 3 B 3 K          | 9 T             | 3 Q            | 9         |
| R16       | 3 B 4 J          | 12 U            | 3 Q            | 10        |
| R17       | 1 D 1 M          | 1 A             | 4 P            | 6         |
| R18       | 2 C 4 J          | 8 T             | 2 R            | 8         |
| R19       | 4 A 3 K          | 12 U            | 3 Q            | 10        |
| R20       | 2 C 1 M          | 2 A             | 3 Q            | 6         |
| R21       | 4 A 2 L          | 8 T             | 3 Q            | 9         |
| R22       | 4 A 2 L          | 8 T             | 3 Q            | 9         |
| R23       | 4 A 2 L          | 8 T             | 3 Q            | 9         |
| R24       | 4 A 2 L          | 8 T             | 3 Q            | 9         |
| R25       | 2 C 3 K          | 6 T             | 2 R            | 7         |
| R26       | 3 B 3 K          | 9 T             | 2 R            | 8         |
| R27       | 3 B 3 K          | 9 T             | 2 R            | 8         |
| R28       | 2 C 3 K          | 6 T             | 3 Q            | 8         |
| R29       | 3 B 2 L          | 6 T             | 3 Q            | 8         |
| R30       | 3 B 3 K          | 9 T             | 3 Q            | 9         |
| R31       | 3 B 2 L          | 6 T             | 3 Q            | 8         |
| R32       | 4 A 1 M          | 4 A             | 1 S            | 6         |
| R33       | 1 D 3 K          | 3 A             | 3 Q            | 7         |
| R34       | 3 B 2 L          | 6 T             | 2 R            | 7         |
| R35       | 1 D 2 L          | 2 A             | 3 Q            | 6         |
| R36       | 1 D 2 L          | 2 A             | 3 Q            | 6         |
| R37       | 1 D 2 L          | 2 A             | 3 Q            | 6         |
| R38       | 3 B 1 M          | 3 A             | 2 R            | 6         |
| R39       | 3 B 2 L          | 6 T             | 2 R            | 7         |
| R40       | 2 C 2 L          | 4 A             | 1 S            | 5         |
| R41       | 3 B 2 L          | 6 T             | 3 Q            | 8         |
| R42       | 3 B 1 M          | 3 A             | 3 Q            | 7         |
| R43       | 3 B 1 M          | 3 A             | 3 Q            | 7         |
| R44       | 2 C 1 M          | 2 A             | 3 Q            | 6         |
| R45       | 3 B 3 K          | 9 T             | 3 Q            | 9         |
| R46       | 2 C 1 M          | 2 A             | 3 Q            | 6         |
| R47       | 2 C 1 M          | 2 A             | 3 Q            | 6         |
| R48       | 3 B 1 M          | 3 A             | 2 R            | 6         |
| R49       | 2 C 1 M          | 2 A             | 3 Q            | 6         |
| R50       | 1 D 1 M          | 1 A             | 2 R            | 4         |
| R51       | 3 B 4 J          | 12 U            | 3 Q            | 10        |
| R52       | 4 A 1 M          | 4 A             | 2 R            | 7         |
| R53       | 3 B 3 K          | 12 U            | 3 Q            | 10        |
| R54       | 3 B 4 J          | 12 U            | 3 Q            | 10        |
| R55       | 2 C 4 J          | 8 T             | 3 Q            | 9         |
| R56       | 2 C 4 J          | 8 T             | 3 Q            | 9         |
| R57       | 2 C 2 L          | 4 A             | 3 Q            | 7         |
| R58       | 3 B 4 J          | 12 U            | 2 R            | 9         |
| R59       | 2 C 1 M          | 2 A             | 3 Q            | 6         |
| R60       | 2 C 1 M          | 2 A             | 3 Q            | 6         |
Table 7. Hazard totem pole (HTP) diagram

| Total HTP Index | Risk Factor Code | Risk Code | Cumulative Risk Factor Count | Cumulative Risk Control Cost (US$) |
|-----------------|------------------|-----------|-----------------------------|-----------------------------------|
| 10              | BJQ R1, R5, R16, R51, R54, R58 | 6         | 2,567                       |
| 10              | AKQ R19           | 7         | 2,733                       |
| 9               | BKQ R6, R7, R14, R15, R30, R45, R53 | 14        | 4,500                       |
| 9               | ALQ R21, R22, R23, R24 | 18        | 5,433                       |
| 9               | CJQ R55, R56      | 20        | 6,367                       |
| 8               | CKQ R3, R28       | 22        | 6,867                       |
| 8               | CLP R4            | 23        | 6,947                       |
| 8               | BKR R8, R9, R26, R27 | 27        | 11,480                      |
| 8               | CJR R18           | 28        | 12,513                      |
| 8               | BLQ R29, R31, R41 | 31        | 13,180                      |
| 7               | CKR R2, R25       | 33        | 15,347                      |
| 7               | BLR R13, R34, R39 | 36        | 18,780                      |
| 7               | DKQ R33           | 37        | 19,380                      |
| 7               | BMQ R42, R43      | 39        | 20,447                      |
| 7               | AMR R52           | 40        | 22,113                      |
| 7               | CLQ R57           | 41        | 22,447                      |
| 6               | BMR R10, R38, R48 | 44        | 25,847                      |
| 6               | CMQ R11, R12, R20, R44, R46, R47, R49, R59, R60 | 53 | 31,380                      |
| 6               | DMP R17           | 54        | 31,433                      |
| 6               | AMS R32           | 55        | 41,567                      |
| 6               | DLQ R35, R36, R37 | 58        | 42,367                      |
| 5               | CLS R40           | 59        | 54,367                      |
| 4               | DMR R50           | 60        | 55,700                      |

Probability of occurrence

| Often       | R18, R55, R56 | R1, R5, R16, R51, R54, R58 |
| Infrequent  | R33           | R2, R3, R25, R28            |
| Rare        | R35, R36, R37 | R4, R40, R57                |
| Extremely    | R17, R50     | R11, R12, R20, R44, R46, R47, R49, R59, R60 |

Figure 2. Risk Mapping

code. The smallest total HTP index is 4 with the risk factor code DMR. A risk factor with the code of DMR (or 1, 1, 2) is associated with a negligible consequence severity and an extremely rare probability of occurrence, involving a cost between US$10,000-US$100,000 to implement risk reduction action plans.

The cumulative cost is the sum of the risk prevention costs to mitigate each risk. The company may have a certain amount budgeted for the implementation of mitigation strategies. Beginning from the top, the company can decide to carry out all risk mitigation plans until the cumulative risk control costs are equal to or exceed the budget. Using this approach, the company can have the largest risk mitigation impact while simultaneously being fiscally responsible. Risk response actions can be performed by the priorities and existing resources in the company (Tummala & Schoenherr, 2011).

SCRMP Phase III

For this study, risk management strategies are
based upon the probability of occurrence and severity level. There are four responses in the risk matrix as shown in Figure 2. Based on the risk mapping (Blahut et al., 2014), for this study, the company should take the risks shown in green, transfer the risks shown in yellow, treat the risks shown in orange, and terminate the risks shown in red. The risks categorized as most critical and unacceptable are: lack of strategic forecast (R1), port capacity and port congestion (R5), demand and supply uncertainty (R16), container shortage (R19), manual transportation scheduling (lack of computerization) (R51), late deliveries (R54), and overcapacity in the ship (R58). Because of this categorization, the prescribed response is to terminate these risks as follows.

1. Lack of Strategic Forecast (R1)

Previously, company implementation of forecast strategy was only based on experience from the manager of the sales and marketing department, not with the aid of historical data by the use of forecasting tools (Pradita & Ongkunaruk, 2019). Container forecasting was also combined between export containers and local containers, resulting in a forecasting error that caused delays in shipping and reduced the customer service level. The customers have to wait for the containers to be available before the next process can be carried out. The adjusted forecasting method is an effective method to reduce forecasting errors or increase forecast accuracy (Khamphinit & Ongkunaruk, 2016). The company should separate the usage of export and local containers and employ an aggregate forecast by time, location, and container size.

2. Port Capacity and Port Congestion (R5)

Tanjung Perak port is one of the largest and busiest ports in Indonesia. Its capacity has remained the same since 2000, but activities such as loading and unloading of cargo in Tanjung Perak port have recently seen an exponential increase (Pradita & Ongkunaruk, 2019). The resulting overcapacity created a congestion issue, with long queues presenting daily during the loading process. Besides, circulated containers in the container yard consume most of the yard space. Issues of inadequate infrastructure and small capacity are common among ports in Eastern Indonesia. To mitigate these challenges, the company should implement effective risk mitigation, integrated communication with shipping companies and ports of destination to carry out the cargo shipments properly. Effective risk mitigation also helps minimize long queues during the loading process (Fabianová & Ridoňová, 2015).

3. Demand and Supply Uncertainty (R16)

The condition of Indonesia, which has many islands and uncertain weather, results in inconsistent demand and supply. A strategy forecast was performed to mitigate this risk. With the right forecast, container demand could be accurately predicted while container tracking is also needed to detect the position of containers owned by the company (Pradita & Ongkunaruk, 2019). During this time, containers were sent out of the island of Java but did not return directly, resulting in a lack of container supply. Companies are encouraged to maintain communication and relationships with customers and understand the ordering habits made by each customer so that the sales and marketing department can provide service offers before customers place orders.

4. Container Shortage (R19)

Containers are sent outside Java, especially in Eastern Indonesia, with delivery times ranging from 2 to 8 days. Many of these containers do not return directly to Surabaya. It generally takes between 4 and 16 days for a container to complete a direct round trip. This round trip time leads to container shortages at the Surabaya depot since there are limited numbers of available containers. According to Pradita & Ongkunaruk (2019), the company is expected to be able to collect container data in spreadsheets and use regular inventory systems. Inventory simulation was proposed to determine the right inventory policy, namely, reorder points and maximal inventory, to minimize the total cost while maintaining the service level. With the right inventory policy, it is expected that the risk of container shortage will be decreased and service levels will remain satisfied (Chopra & Sodhi, 2004).

5. Manual Transportation Scheduling (Lack of Computerization) (R51)

Paperwork processing is also inefficient. Operational scheduling, such as the stuffing process to the customer, is still manually completed by the customer service staff. The schedule given by the shipping company is always close to the ship's departure, which results in an ineffective stuffing process. Companies are supposed to switch to
better data management by using a simple spreadsheet to schedule or implement an Enterprise Resource Planning (ERP) system in advance (Tummala & Schoenherr, 2011). Management data and technology are expected to reduce these risks and promote more effective and efficient work.

6. Late Deliveries (R54)

Late delivery is normally caused by personal and operational conditions. Drivers and technicians who are less agile in carrying out their duties are one of the personal conditions that cause delays in delivery. Additionally, operational conditions such as trucks and generators sometimes have unexpected damage. To overcome this risk, the company can provide more training to drivers and technicians to responsibly execute their duties (Fabianová & Ridžoňová, 2015). Routine maintenance of trucks and generators is required by operational departments, while real-time tracking is also needed to check the status of container shipments.

7. Overcapacity in the Ship (R58)

There are several destination routes with low shipping schedule frequency. Because of the low frequency, the shipping line company will maximize the number of containers on the ship, resulting in frequent instances of overcapacity. Overcapacity on ships causes damage to cargo in the containers and increases the risk of transportation accidents. The company should ensure capacity on the ship from the shipping line company and implement effective scheduling strategies before the shipping process.

CONCLUSION

The company must implement risks management, using a SCRMP, to control and monitor all risks that can arise in the company. Risks that have an unacceptable level are lack of strategic forecast (R1), port capacity and port congestion (R5), demand and supply uncertainty (R16), container shortages (R19), manual transportation scheduling (lack of computerization) (R51), late deliveries (R54), and overcapacity on the ship (R58). The risk mitigation strategies that companies can use are forecasting based on quantitative and qualitative approaches, implementing effective and up-to-date communication integration with shipping companies, inventory simulation by setting inventory policies to reduce total costs and implementing good data management strategies, such as using spreadsheets in Excel or using an Enterprise Resource Planning (ERP) system.

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