

Risk Mitigation for Strengthening Supply Chain Strategies in the Pandemic Era

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Abstract

E-procurement in the organization will help the procurement process be more efficient and effective. In the development of e-procurement, there can be several risks. Therefore, risk analysis is needed in the e-procurement planning process to overcome these risks. The identified risks are ranked using the FMEA method by filling out a questionnaire by the respondents. Based on the results of risk analysis using FMEA, three high risks were found. The risk is that the user does not receive a notification if the procurement request is successfully made. The procurement report cannot be uploaded, and the procurement request cannot be continued. From this analysis, mitigation recommendations can be made to reduce or eliminate risk so that the e-procurement made is more stable to changes and can cover the entire procurement process.

Keywords –

Risk, e-procurement, risk, failure model effect analysis, procurement, eliminate-risk

1. Introduction

Supply chain management is the management of the flow of goods and services and includes all processes that transform raw materials into final products. It involves the active streamlining of a business's supply-side activities to maximize customer value and gain a competitive advantage in the marketplace. Procurement is the process of finding and agreeing to terms, and acquiring goods, services, or works from an external source, often via a tendering or competitive bidding process.

E-procurement in the organization will help the procurement process be more efficient and effective. In the development of e-procurement, there can be several risks. Therefore, risk analysis is needed in the e-procurement planning process to overcome these risks. E-procurement was chosen because it can be applied in various lines of business, such as in companies, small and medium enterprises, and government. In utilizing a new system such as e-procurement, it is necessary to pay attention to the risks that may occur so that there is no process failure when using e-procurement. Therefore, a risk analysis is needed to deal with these problems. Several methods can be used in risk analysis, one of which is Failure Mode and Effect Analysis (FMEA). This paper will discuss the use of FMEA in the design phase of e-procurement to identify the risks that may occur and develop actions to prevent these risks when e-procurement has been implemented.

FMEA was chosen because of its flexibility. This method is widely used in several products or processes, such as the design phase of electric motor systems, corruption analysis, geothermal power plants, etc. In addition, this method can identify potential problems in the process, control the process, and identify what can go wrong when a process is executed. This will allow the opportunity to mitigate problems before they occur. The scope of E-procurement only covers requests for goods/services by users, monitoring the status of requests for goods/services, and delivery of goods/services by the procurement team to users (Larkin *et al.*, 2019). The financial process related to the procurement of goods/services and the supplier selection process is not included in the e-procurement that will be made. This e-procurement also only applies to the process of procuring goods/services in the internal environment and is not included in LPSE information system owned by government (Aven, 2016).

This paper will discuss the use of FMEA in the design phase of e-procurement to identify the risks that may occur and develop actions to prevent these risks when e-procurement has been implemented. FMEA was chosen because of its flexibility. This will allow the opportunity to mitigate problems before they occur. The scope of E-procurement only covers requests for goods/services by users, monitoring the status of requests for goods/services, and delivery of goods/services by the procurement team to users. The financial process related to the procurement of goods/services and the supplier selection process is not included in the e-procurement that will be made.

2. Literature Review

A systematic approach was then to make the risks clear, formally delineated, and make them manageable. This approach makes risk management a management tool that requires practical experience and training to use (Mills, A., 2001). The merging of supply chain management and risk management has become a new area of research for academics and has attracted the attention of practitioners. Supply chain risk management is a wedge between supply chain management and risk management. It is by Paulsson (Brindley, 2004), shown in the following figure:

Risk collaboration in the supply chain makes supply chain management more developed. If at first research on supply chain management was only classified into three categories, namely operational, technical, and strategic fields (Huan *et al.*, 2004), then with the risk research in the supply chain called supply chain risk management (SCRM), the categories were added to four, namely operational, technical, and strategic and risk.

1.1 Supply Chain Management

Oliver and Weber first proposed the term supply chain management in 1982 (cf. Oliver & Weber, 1982; Lambert *et al.* 1998); if the supply chain is a physical network, companies involved in supplying raw materials, supporting materials, produce goods or deliver them to end-users.

A supply chain includes all parts of a process both directly and indirectly to meet consumer demand, not only for manufacturers and suppliers, but also including transportation, warehousing, retail, and consumers themselves (Chopra and Meindl, 2004). *Supply chain management* is an effort to regulate and manage the stages contained in the supply chain to produce maximum profits. These stages include:

- Consumer
- Retail
- Wholesaler
- Manufacture
- Raw goods consumer supplier

Properly managing the flow of materials in the form of spare parts is one of the main objectives of the supply chain. The proper flow means it is not too late and not too early, the amount is correct, and it is delivered to where it is needed.

Therefore, supply chain management is oriented to the company's internal affairs and external affairs concerning the relationship between partner companies. It takes coordination and collaboration between companies in the supply chain to satisfy the final component; they must work together to make inexpensive products delivered on time and of good quality. In essence, all companies have a method or approach in managing supply chains. However, not all of them apply an interactive and collaborative approach to ignore constraints or risks in supply chain management.

2.2 Risk and Risk Management.

Risk is the positive or negative effect of the possibility that can occur on an object. All activities in an organization contain risks, therefore risk management is needed to direct and control organizational activities that contain risks. The risk management implementation process can always be developed and its performance improved, so that the organization can integrate the risk management process into part of the overall organizational governance system. The risk management process is depicted as shown in the figure. Communication and Consultation Establish context Risk identification Risk analysis Risk evaluation Risk action Monitoring and review Risk assessment. In the risk management process, there is a risk analysis that functions to identify risks, so that an action plan can be determined against these risks. Where risks cannot be eliminated, the organization must be able to determine whether the identified risks are mitigated or acceptable.

Failure Mode and Effect Analysis (FMEA) is a systematic risk management method that can be used to evaluate and document the causes and effects of failures in a process. FMEA dates to the 1940s when it was used by the United States military and was later developed and implemented by the aviation and automotive industries. Then in 1980 to 1990, FMEA began to be widely applied by other industries. FMEA can identify and evaluate the potential failure of a product or process and the effects that may arise, as well as the necessary actions to eliminate or reduce the potential failure that may occur. The sequence of processes in FMEA is: a. Describe the process in the system, b. Identify the potential failure of each process, c. Identify the effects of failure (and causes) of each process, d. Determine the level of failure effect (severity), e. Estimating the chance of failure. f. Identifying failure detection actions (detection), g. Making rankings and priorities (using Risk Priority Number / RPN analysis), h. Recommend preventive measures, i. Implement recommendations and update analysis. The RPN value is calculated based on the following formulation: $RPN = S \times O \times D$ (1) where: S = level of the potential effect of failure (severity) O = level of probability of failure (occurrence) D = level of possible detection of failure (detection) The rating scale of S, O, and D is 1- 10 with their respective descriptions as shown in the table below.

Currently, many companies are trying to find solutions to supply chain problems due to the COVID-19 pandemic. Various plans and strategies were made, ranging from short-term, medium-term to long-term strategies that were continuously updated. This is done to evaluate risks in a systematic, real-time manner, and to make it easier to make the right decisions. One of the keys to increase the strength of a company's supply chain is to gain visibility into the supply chain process from upstream to downstream. This method can be done by mapping the company's supply chain digitally to develop and implement a strategy that is continuous and updated. To carry out this strategic approach, all parties involved need to be involved in an organized manner for risk reporting in each sector and carry out an analysis related to the appropriate settlement method and its impact on the supply chain process. Although there are already several digital services related to supply chain management, such as Resilience 360, companies still need to consider flexibility. The most important thing is adjusting strategies that specifically aim to ease the burden on the supply chain during this pandemic.

Failure to plan and implement inadequate supply chain strategies can cause company losses, as happened to the Hanjin container carrier, which has a prolonged impact on several parties and the company itself. In addition, in terms of IT systems, companies are also required to consistently monitor the IT security of their suppliers. For example, this is also a lesson in the disruption of computer virus attacks at the Maersk company in 2017, as well as current and future cyber threats (Goerlandt and Montewka, 2015).

Therefore, special measures are needed to mitigate supply chain risks. With objectives that vary between companies and their supply chain strategies. Below we will discuss the appropriate steps that can increase the resilience of the company's supply chain in outline:

3. Methodology

Failure Mode and Effect Analysis (FMEA) is a systematic risk management method that can be used to evaluate and document the causes and effects of failures in a process. FMEA can identify and evaluate the potential failure of a product or process and the effects that may arise, as well as the necessary actions to eliminate or reduce the potential failure that may occur. The sequence of processes in FMEA is:

The methodology in this research is descriptive analytic. Research is carried out in the unit in charge of supply chain management. Figure 1 describes the sequence of activities in this study.

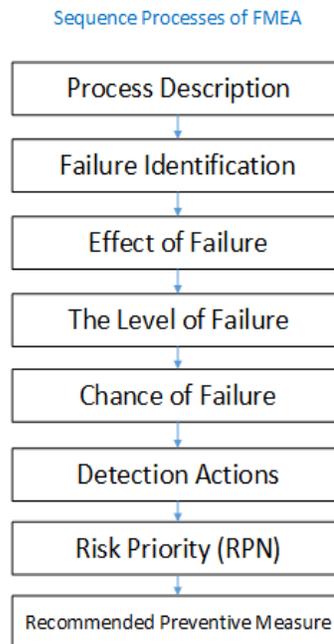


Figure 1. Methodology Research

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4. Result And Discussion

The basic rule in minimizing supplier risk is to avoid supplier strategies that depend on only from one location or from one company. It's not just about reducing supplier dependency. As in the current situation where many companies only cooperate with Supplier (for example: manufacturers company from China) without evaluating upstream sources to reduce the risk of disruption. These disturbances can be in the form of internal and external factors, but the most obvious is the celebration of the Lunar New Year which results in many producers / companies not being able to carry out production properly when outside the festive month.

This research activity is being submitted as a proposal to the funding agency. However, we will explain the steps that will be taken and want to be achieved. These steps are case options, considering the current situation

- **Supplier Diversification and Regionalization of Supplier**

The basic rule in minimizing supplier risk is to avoid supplier strategies that depend on only one location or from one company (Leiss and Krewski, 2019). It's not just about reducing supplier dependency. As in the current situation where many companies only cooperate with Chinese companies or manufacturers without evaluating upstream sources to reduce the risk of disruption. These disturbances can be in the form of internal and external factors, but the most obvious is the celebration of the Lunar New Year which results in many producers / companies not being able to carry out production properly when outside the festive month.

Currently, there is a shift in production trends from companies in China to companies in Southeast Asia, India or Mexico, where this is often referred to as 'China + 1' or 'China + 2'. This strategy requires the company to re-evaluate the distribution network to ensure the alignment of needs and agreed production processes (Ntwali et al., 2020). In other words, a regional approach is very important to reduce costs related to distribution, duration, and production limitations due to other factors, because a regional approach uses goods sourced around the country's territory to supply demand in the same region. An example of an E-Commerce company that takes a regional approach is Shopee, where this company, although based in Singapore (Birungi and Muthoni, 2021).

- **'Port Diversification' Strategy**

Although some parties consider that it is more efficient and effective to import only through one particular the level of associated risk is also higher. This is due to the nature of distribution dependence, which is crucial in the order fulfillment process, especially when there are disturbances that can hinder distribution. For this reason, the company's supply chain strategy must also consider this avoid dependence on one port in a regional or global region.

- **“Just in Case” and “Just in Time” Inventory Management**

Companies are advised to maintain additional inventory for critical items, such as single-sourced spare parts or raw materials, or items with long and variable delivery times. Given the current situation where interest rates are low, the cost of capital element in inventory holding costs is also low, creating a buffer on regional inventories of essential goods such as raw materials or finished goods at alternative distribution locations. This allows for continuity of supply to the customer in the event of an emergency (Larkin et al., 2019).

- **Selection of Multimodal Transportation**

Companies should consider investing in distribution solutions closer to hubs, which include intermodal rail terminals or multimodal hubs (e.g., highways, rail and sea lanes) to reduce the risk of stringent trucking capacity regulations or ever-increasing shipping costs. increase.

- **Evaluation of Relationships Between Parties Involved in the Supply Chain**

Building a robust quality supply chain involves different trade-offs as actions to reduce risks that can impact costs, efficient and customer service. Therefore, companies must evaluate the supply chain network regularly to ensure solutions that are effective in service, as well as cost efficiency, especially in situations of overlapping due to downtime at a supplier source or distribution center.

5. Conclusion

Retaining a skilled workforce has become the biggest challenge for companies, due to the demands of technological developments and labor competition which are mostly driven by e-commerce. In this pandemic era, rising unemployment can reduce the pressure on labor needs in the short term. However, many companies are reducing costs related to their automation investment, resulting in less exploration of opportunities to improve supply chain efficiency. The solution starts from the upstream of a supply chain process, starting from company procurement that can be simplified and clearly measured. Presence Digital Procurement provides convenience for company procurement actors to reduce supplier risk, as well as facilitate the search for goods. In addition, there is also a digital approval process to speed up and facilitate procurement approvals, as well as limiting company spending quotas to match the initial procurement strategy and increase transparency.

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Biography

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