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Logistics Risk Management at CV. Protani in Palu City

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Abstract: This study examines logistics risk management at CV. Protani in Palu City using a descriptive qualitative approach. The study aims to identify, analyze, and evaluate logistics risks within CV. Protani. The research methods employed include direct observation and interviews with the company owner, administrator, and transportation drivers involved in the company's logistics activities. The results reveal a total of 11 risks identified in the logistics activities of CV. Protani. These risks stem from both internal and external factors. The analysis indicates that 5 risks have moderate impacts, 4 risks have high impacts, and 2 risks have very high impacts on the company. Therefore, risks with high and very high impacts require mitigation efforts to reduce their effects and likelihood of occurrence, thereby minimizing potential losses in the company's logistics activities.

Keywords: Risk Management, Logistics Risk, Delivery Services

INTRODUCTION

The existence of delivery services has an important role in supporting various aspects of economic and social life in the City of Palu, with the existence of goods delivery services can help the community in distributing goods and commodities to various regions in Central Sulawesi. CV. Protani is a company engaged in logistics based in the city of hammer. The company built a network that focuses on two areas in Central Sulawesi, namely Toli-Toli and Buol by offering delivery services by land

The role of goods delivery services is needed by the community, delivery services are a service business that offers services to deliver goods from one place to another. The best service is the key to success for service companies, so that goods delivery services cannot be separated from the risks that will be faced in their activities (Vikaliana, 2017). Risk is uncertainty about future events (Muhammad et al., 2017). In running a business, risk management is very important to pay attention to because the more the company develops, the higher the risk that the company will get. The purpose of implementing risk management is to protect the company against losses that will be obtained (Arifudin, 2020). In general, risk management is the implementation of management functions to manage risks both in

companies and society. Risk management is the process of analyzing situations that can result in losses or endanger the successful performance of a company (Aprilia et al., 2023).

The rapid economic growth makes competition between companies even higher, strategic steps from companies are needed in the process of procuring goods or services that are effective and efficient to answer the challenges of increasingly fierce business competition (Ardiansyah et al., 2015). To ensure that planning will be in line with the conditions in the field, companies must analyze the logistical risks that will be obtained so that the company is able to minimize the possibility of these risks occurring (Martono, 2018). Logistics risk management is the company's procedure in dealing with possible risks that will occur (Zai et al., 2022).

Inefficient logistics will increase logistics costs, so to overcome this, making the right logistics model is important (Nofal et al., 2019). Overall, logistics is a very important part that is closely related to other parts of the company to improve company performance (Hadi and Parubak, 2016). Logistics is the activity of moving goods from the place of origin to the hands of consumers (Rismara et al., 2021). Logistics is not just an activity of shipping goods, Logistics is a system that is interrelated with one another (Martono, 2018). Logistics activities consist of planning, implementation, and supervision during the process of moving goods from the place of origin to the delivery destination (Zai et al., 2022). Human resources are also a very important factor in logistics activities, because human involvement starts from the planning, collection, to distribution and handling of logistics (Apriawan et al., 2016).

This study aims to identify the risks that occur in logistics activities at CV. Protani. The risks that have been identified will be analyzed to find out how much impact the risk has on the company, then evaluated which aims to provide mitigation efforts for risks that are considered to be detrimental to the company.

LITERATURE REVIEW

Risk Management

Risk management is a field of science that explains an organization in mapping various existing problems using a comprehensive and systematic management approach (Thahir et al., 2018). Risk management is an effort that aims to find out, analyze and control risks in company activities that aim to find out higher effectiveness and efficiency (Darmawi, 2014).

Risk can be interpreted as a form of uncertainty about a situation that will occur in the future with decisions obtained based on current considerations (Fahmi, 2015). Therefore, decision-making needs to prepare some appropriate actions and assumptions about risk outcomes. having a good understanding of the dimensions of risk can lead to making the right decisions (Fitrianto and Hadi, 2012).

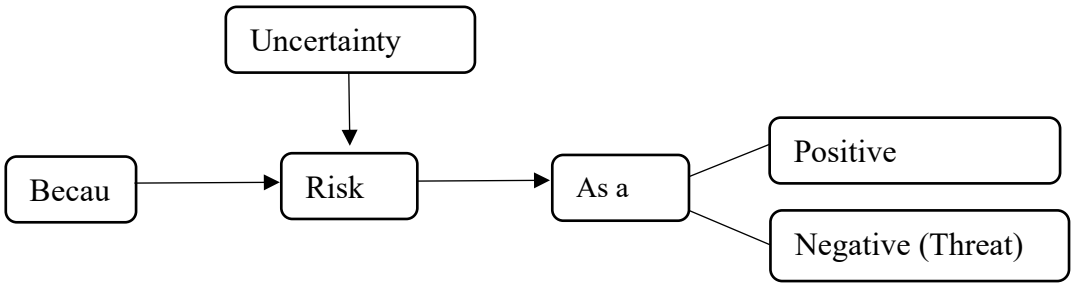

Figure 1: Risk Model (Bielecki, 2018)

The risk model shows that there is a specific cause of the risk. However, due to uncertainty, the risk may occur, but it is not certain to occur. The impact of risk on the company can be negative or positive (Bielecki, 2018).

Risk Management in Logistics

Risk is an unpredictable event, risk can have a negative effect on company performance, so companies need to prepare to anticipate the occurrence of these risks (Kristiana et al., 2022). Logistics is the process of flowing goods or services from source to destination which consists of planning, implementing, and controlling the flow of goods or services and information from the starting point to the consumer point effectively and efficiently (Raza et al., 2020). Logistics plays a major role in ensuring the flow of goods or services from the point of origin to the point of consumption effectively and efficiently (Nurdin et al., 2024). Logistics aims to deliver goods and various materials in the right quantity at the required time, in a usable state, to the intended location at a low total cost (Bowersox, 1986). Determining logistics costs is also one aspect that is difficult for businesses to determine. Lack of understanding of what items are included in logistics costs will be a risk in improving operational efficiency (Rombe and Hadi, 2022).

Logistics risk is an event that cannot be predicted, this can occur due to improper material, improper quality, improper time and improper place (Fuchs and Wohinz, 2009). Therefore, it is important to have logistics risk management to identify, analyze, and manage risks effectively so that the company can minimize the losses that will occur. In order to identify logistics risks, it is important to compile risk sources that fit into a considered framework. These sources provide an overall perspective of possible logistics risks (Kristiana et al., 2022).

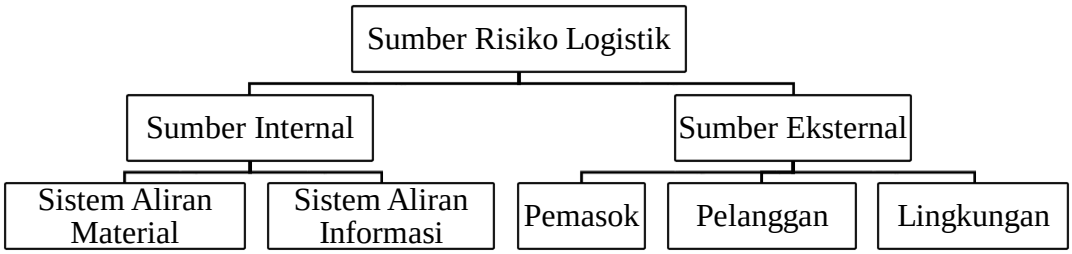

Figure 2: Logistics Risk Sources (Fuchs and Wohinz, 2009)

The sources of logistics risk are internal and external. Internal sources, namely material flow systems and information flow systems, are at the root of logistics risk. External sources of risk include suppliers, customers and the environment. Regardless of the source of logistics risk, there are 4 factors to reduce the occurrence of logistics risk, namely:

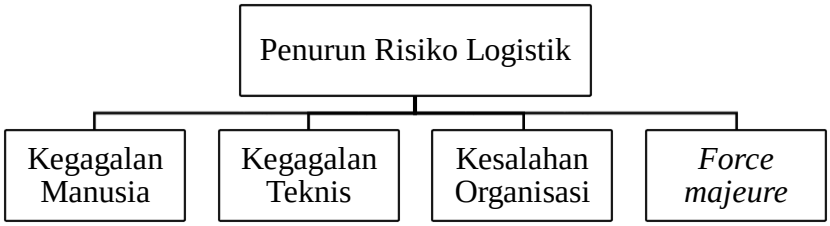

Figure 3: Logistics Risk Reduction (Fuchs and Wohinz, 2009)

Risk can be caused by both intentional and unintentional human failures. Technical failures stem from hardware or software that cannot be used as intended. Risks that can be caused by the organization are unclear responsibilities and poor workflow. Meanwhile, *force*

majeure is an uncontrollable event such as floods and war, so avoiding it can reduce the occurrence of risk. The combination of logistics risk sources and logistics risk reducers will be very useful to identify potential risks that can occur in logistics activities. By understanding the risk factors, companies will develop more effective risk mitigation strategies (Kristiana et al., 2022).

Identifying risks can be done based on risk sources and risk reduction. However, a business is strongly influenced by product strategy because there is a plan to achieve predetermined goals by considering factors that can affect these goals (Fuchs & Wohinz, 2009). Strategy can be defined as a plan or procedure to achieve predetermined goals by considering factors that will affect the goal. strategy is used after the company sets its goals (Pasaribu et al., 2021).

Figure 4: Product Strategy (Fuchs and Wohinz, 2009)

The most important characteristics in a logistics strategy are product attributes. Product attributes such as volume, weight, or the need for special treatment will create a framework that can reduce the occurrence of logistics risks, for example, goods that have large storage but limited storage space will inhibit inventory levels in storage, which will disrupt material flow. The higher the value of an item, the higher the risk of theft, so special treatment is needed, such as increasing security in the storage area to minimize the risk of theft (Fuchs & Wohinz, 2009).

In addition to product attributes, the attribute relationship between suppliers and customers is very important in product strategy. Building cooperation will lead to dependence, it requires trust in each other. This will be a risk if the supplier fails, then the customer will have difficulty finding other alternatives because from the beginning there has been dependence by the supplier. So that the supplier can lose investment, this will cause serious problems (Fuchs & Wohinz, 2009). Customer satisfaction is an important element to achieve sustainable business success (Adam et al., 2023). However, customer satisfaction alone is not enough to create customer loyalty to the company (Suharno et al., 2024). Good service quality will result in customer satisfaction (Simatupang & Miru, 2023). In establishing cooperation, both suppliers and customers need to maintain a harmonious relationship. A good relationship with customers can help build long-term loyalty while maintaining the company's competitive advantage (Suparman et al., 2023)

RESEARCH METHODS

The research approach used in this research is descriptive qualitative, which can help researchers to describe, explain, and interpret a situation based on facts that occur in the field (Hairurnisa et al., 2024). Data collection is carried out by interview and direct observation methods to obtain the required data (Sari et al., 2024). The data to be obtained is data related to logistics risks that occur at CV. Protani. The informants to be interviewed in this study are the company owner, admin, and transportation drivers as parties involved in logistics activities at CV. Protani.

Table 1: Research Informants

Name	Age	Position
Fatimah	44 years old	Owner
Hikma	19 years old	Admin
Darwis	42 years old	Transportation drivers

Source: Primary data

Risk Identification

Risk identification is the process of recognizing and identifying risks that can interfere with the smooth running of logistics activities at CV. Protani, this threat can come from internal and external factors of the company.

Risk Analysis

Risk analysis is a way to identify existing risks, this aims to find out what steps to take when evaluating risks so that they can be right on target.

Risk Evaluation

Risk evaluation is the process of making decisions from the data from the risk analysis that has been carried out. This stage will determine what risks require handling and prioritization in logistics activities at CV. Protani.

RESULTS AND

Scope of CV. Protani

CV. Pro tangguh niaga or Protani is a company engaged in logistics located at Jl. WR. Supratman No. 89 Kamonji Village, Palu City. Initially the company focused on selling agricultural tools, fertilizers and grass poisons. But along the way, the owner felt that the business in that field was not running smoothly. So that in 2009 the owner chose to switch business fields to become a delivery service goods targeting 2 areas in Central Sulawesi, namely Toli-Toli and Buol. CV. Protani offers delivery of goods by land transportation by loading various types of goods ranging from agricultural equipment, fertilizers, poisons, building materials and many more types of goods transported. CV. Protani is a company that provides procurement of goods and services, the process of delivering goods is carried out by means of suppliers leaving their goods, after which the goods will be distributed using a truck. Currently CV. Protani has 11 trucks to transport goods to Toli-Toli and Buol. There are 2 types of trucks used, namely, 6 standard trucks, and 5 long trucks which have a transportation capacity of 9-10 tons.

Risk Identification

The data used in this study is using primary data obtained from interviews with parties involved in logistics activities at CV. Protani.

Table 2. Logistics Risk Identification

Source of Risk	Risk
Internal	entry error Delayed delivery of goods Lost items Damage to goods Item delivery error Storage limitations Failures in information systems Work accident

	Vehicle damage
External	Neighborhood
	Fuel Scarcity

Source: Primary Data

Based on the results of interviews with informants, it was found that logistics risks at CV. Protani comes from 2 sources, namely, internal and external sources. From these two sources, 11 logistics risks were identified.

Risk Analysis

After identifying the risks that can occur, the next step is to analyze the risks that aim to determine the causes and consequences of the risks that have been identified. The overview of risk analysis in Table 3 shows the results of risk analysis data collection obtained from interviews with parties related to logistics activities at CV. Protani. To measure the level of risk that occurs, a risk matrix is made which aims to determine how much impact the risk has on the company.

Table 3. Logistics Risk Analysis

Source of risk	Code	Risk	Because	As a result of
Internal	R1	Data entry error	Admin is not careful in entering delivery data	Confirm with the supplier of the goods and the delivery note must be recalculated.
	R2	Delayed delivery of goods	Changing natural conditions resulting in delayed departures, damaged roads, late entry of cars, the driver is unable to load the goods so the goods will wait for the car that will come the next day.	Late delivery of goods so that customers receive their goods not on time
	R3	Loss of goods	Lack of supervision of goods while in storage	The company should be responsible for replacing lost items
	R4	Damage to goods	Damage to goods comes from shippers who are not careful with damaged goods, the large number of goods being transported so that the goods overlap and cause damage.	If the item is damaged by overlapping with another item, the driver is responsible for replacing the item.
	R5	Item delivery error	Sender entered the wrong address	Items are returned and shipped back to the correct address
	R6	Storage limitations	The number of items to be shipped so that storage becomes full	Storage is no longer able to accommodate goods so the goods are transferred to another warehouse
	R7	Failures in information systems	Driver whose whereabouts are unknown because he is in an area where the network is not good	The company cannot know where the goods are, besides that the customer has questioned the goods that have not arrived.

Source of risk	Code	Risk	Because	As a result of
External	R8	Work accident	The driver was driving in a drowsy/fatigued state so he was not focused on driving, Driver overloaded with goods and had an accident	The driver must compensate for goods damaged by the accident.
	R9	Vehicle damage	Lack of regular maintenance on the car	Had to repair the car to make it operational again
	R10	Neighborhood	Limited parking area for cars, so trucks park in front of people's houses.	Local residents complained that their activities were disrupted by cars parking in front of their houses.
	R11	Fuel Scarcity	Increased fuel demand triggers scarcity	Truck drivers have to queue for hours to get fuel which will cause delays in the delivery of goods.

Source: Primary Data

Figure 5. Word Cloud (NVivo)

The image is a *word cloud* visualization generated using NVivo software, which displays the frequency of certain words in a text dataset. The size of the words in this *word cloud* reflects how often they appear in the data, with larger words such as "already," "car," "road," "driver," and "wrong" indicating that they were used frequently by respondents or in the documents analyzed. This pattern gives an initial idea of the main themes or issues discussed, such as vehicle operations, driver performance, road conditions, or perhaps complaints related to the transportation process. Frequent words can give an indication of the main focus of the discussion or issue, such as operational efficiency, driver complaints, or road infrastructure constraints. This visualization is particularly useful in qualitative analysis, as it makes it easier for researchers to identify key topics that require more in-depth attention. In a research context, this *word cloud* can be used as a first step to support more in-depth thematic analysis and provide insights into respondents' perceptions or experiences of a particular issue, such as transportation or logistics operations.

Table 4. Risk Matrix

OPPORTUNITIES	1 Very low	2 Low	3 Medium	4 High	5 Very high
5 Definitely happens					
4 Happens often		**R6**	**R7**	**R2, R4, R10**	**R3,R11**
3 May occur			**R1, R5**	**R9**	**R8**
2 Less likely to occur					
1 Not likely to happen					
	IMPACT				

Source: Primary Data

According to Markovic (2024) a risk matrix is a tool that can help to evaluate risks that focus on the probability of potential risks by identifying, analyzing and determining the impact of risks using a risk matrix and then prioritizing the risks that have been analyzed. Not only that, according to Yantono and Basuki (2021) if using a risk matrix, it is necessary to identify risks, analyze risks, so as to determine the impact of risks and prioritize risks. Table 4 shows a risk matrix that aims to determine the impact of risks that have been analyzed at CV. Protani using a 5x5 matrix, where the column shows the opportunity and the row shows the impact. The results show that risks that have a very high impact are in the upper right quadrant, namely R3 and R11 this is due to a combination of opportunities that often occur and very high impacts. While the high-impact risks, namely R2, R4, R10, and R8, are in the middle of the matrix with a combination of probable or frequent opportunities with high and very high impacts. Finally, medium risks are in the lower left quadrant, namely R6, R7, R1, R5, R9 with a combination of frequent and possible opportunities and low, medium, and high impacts.

Risk Evaluation

The risks that have been analyzed will then be evaluated, each risk that may occur can be categorized by referring to table 4, namely the risk matrix. This is done to make it easier to make decisions from existing risks. Risk categories can be explained in the following table.

Table 5. Risk Categories

Risk	Opportunities	Impact	Frequency	Risk Category
Data entry error	3	3	> 1 time a year	Medium
Delayed delivery of goods	4	4	> 1 time a month	High
Lost items	4	5	> 1 time a month	Very high
Damage to goods	4	4	> 1 time a month	High
Item delivery error	3	3	> 1 time a year	Medium
Storage limitations	4	2	> 1 time a month	Medium
Failures in information systems	4	3	> 1 time a month	Medium
Work accident	3	5	> 1 time a year	High
Vehicle damage	3	4	> 1 time a year	Medium
Neighborhood	4	4	> 1 time a month	High
Fuel Scarcity	4	5	> 1 time a month	Very high

Source: Primary Data

The results of the risk category shown in table 5 show that there are 5 moderate risks, 4 high risks, and 2 very high risks. So for the high risk category and very high risk, risk mitigation is needed. Risk mitigation is the right action to reduce the occurrence of risk

Table 6. Risk Mitigation

Risk	Risk Category	Risk Mitigation
Delayed Delivery of Goods	High	Scheduling deliveries regularly, so that goods that arrive first are prioritized for transportation and delivery to customers.
Lost items	Very high	Increase supervision in the storage area, such as installing CCTV in order to monitor activities in the storage area directly, using CCTV can make it easier to identify the perpetrator in case of loss of goods.
Damage to goods	High	Be more careful in loading goods so that they do not fall and put heavy goods at the bottom so that they do not overlap which will cause damage to the goods.
Work accident	High	When driving and feeling tired or sleepy should make a stop for a short break, and make sure the truck is loaded with maximum capacity to avoid accidents due to overloading.
Neighborhood	High	The company should implement a rotating parking system so as not to disturb the surrounding environment, and cars that have not yet transported goods should park in another warehouse located on Cucumber Street.
Fuel Scarcity	Very High	Ensure to fill up the fuel tank before departing, especially in areas where scarcity is common.

Source: Primary Data

CONCLUSIONS

From the results of risk identification, there are 11 risks that occur in logistics activities at CV. Protani, these risks come from internal and external companies. After identifying the risks, they are then analyzed, the results of which show that there are 5 medium impact risks, namely the risk of storage limitations, failures in information systems, data entry errors, shipping errors, and vehicle damage. For high risks, there are 4 risks, namely delays in delivery of goods, damage to goods, the surrounding environment, and work accidents. While there are 2 very high risks, namely, loss of goods and fuel scarcity. So for risks that have a high and very high impact on CV. Protani requires risk mitigation which aims to reduce the impact and opportunity for risks in logistics activities that can harm CV. Protani.

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