Identify The Operational Risk Of The Port By The Risk Breakdown Structure (RBS) Method

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Abstrak. The risk arises from the uncertainty that comes from internal and external factors. Risk is quite complex in the port will affect the sustainability of the company's business, especially related to port operations. Operational risk is a risk arising from the implementation of the business functions of the company namely; systems, processes, people, as well as external events. Successful measurement of operational risk will be greatly influenced by the reliability and effectiveness of risk measurement methods. The Risk Breakdown Structure (RBS) method adopted from the Work Breakdown Structure (WBS) will be able to define and group risk-based risks for each level in detail so that the measurement of operational risk provides a structured overview of all risks facing the firm. The scope of port activities studied in this study is related to the flow of goods categorized into 4 parts namely; ship service, goods service, loading and unloading service, and container terminal service. From the identification result, there are 9 operational risks in which each group is divided into operational risk category.

1. Introduction
The results of customer satisfaction survey and loyalty to Port X decreased from 82.60% in 2016 to 77.25% in 2015. This achievement is still lower when compared to similar ports. The value of customer dissatisfaction increased from 21.05% to 30.50%. The level of customer engagement in particular the category of companies only amounted to 68.6%. The Long Term Corporate Plan Report of 2014-2018 states that the human resource productivity of Rp 266.34 million per employee is lower compared to similar ports of Rp 766.81 million per employee. Employee satisfaction level to work culture is 3.20, lower than similar port of 4.10. Waiting time average of 2.27 hours, longer when compared to similar ports of 1.39 hours. Dwelling time in the Year 2016 is still about 7 days, longer when compared with similar ports that only for 3 days. Changes in regional, national and international legislation and regulations related to ports as well as security disturbances sourced from external high enough also greatly affect the port business sustainability.

The condition occurring at Port X is due to uncertainty in the port operation which is sourced from internal and external factors. Uncertainty is a condition that illustrates the inadequacy of information about the understanding or knowledge associated with an event, its impact, and the likelihood of occurrence [1].
Uncertainty is a condition that causes the risk. The size of the risk is influenced by the existence of uncertainty [2].

Risk is defined as the likelihood of loss [3]. In the maritime world risk-related research has begun to be developed. Risk is an important issue as it often deals with safety, efficiency and transportation reliability [6]. Risks in port investment are categorized as state risk, social risk, operational risk, environmental risk, financial risk, commercial risk, and monetary risk [4]. In addition, port risk is also categorized as; Country Risk, Organization Risk, Business Risk and Operational Risk [5]. The highest risks facing the maritime world are related to Strategy, Health Safety Environment (HSE), Operational, and Financial [7]. Based on these categories, operational risk is a risk affecting port business sustainability. Basel II Capital Accord defines operational risk as the risk of loss arising from the failure or inadequacy of internal processes, human, external systems or events. Operational risks arise due to poor work culture, lack of management oversight, errors, malice, fraud, poor occupational safety and health, failure to meet environmental requirements, physical disaster, and weak internal control [8].

Risk management is a decision-making process undertaken by identifying, analyzing and mitigating risk measurement results [9]. With this in mind, risk measurement is a systematic process in assessing the effects of human events and activities involving products and systems with risk characteristics. The best approach to identification in risk management is the Risk Breakdown Structure (RBS) adopted from the Work Breakdown Structure (WBS) used in project management. RBS is able to define and group risk-based risks for each level in detail [10]. Effective and detailed risk measurement will result in optimal risk mitigation [11].

RBS is used to categorize each risk. RBS is a grouping of risks in a logical, systematic and structurally structured hierarchical composition of organizational risk hierarchy according to the organizational or project structure. The goal of RBS implementation is the clarity of risk-stakeholders and of enhancing the understanding of organizational or project risks in the context of a logical and systematic framework.

RBS consists of two stages, namely the development stage of RBS and its application stage. The development stage includes the preparation of a hierarchy based on the existing organizational structure or project structure, or based on past experience. If there is a change in the organizational structure or work structure of the Work Breakdown System project then RBS needs to be rearranged to suit the new structure. RBS development results in the first phase will serve as a source of information at a later stage for risk identification, risk analysis, risk reporting. Overall, RBS is similar to the application of risk taxonomy development, only more referring to existing organizational structures or developed WBS.

In the application to the organization, in addition to business processes are also based on the existing organizational structure. As inputs to the RBS preparation process are the risks that have been experienced and are almost always repeated. So it is with known sources of risk. The results of this RBS development take the form of a hierarchical sequence of potential sources of risk for the organization and often have a look like an organizational chart. The RBS development process is a useful activity for conducting a review of areas of concern. The RBS implementation approach can be done through two top-down and bottom-up approaches.

2. Method
Risk identification is performed using the Risk Breakdown Structure (RBS) method. This method is done through two stages of development stage and the implementation stage. In this study the stages are used only until the development stage. Development stage is done by arranging risk hierarchy by using bottom-up approach. This approach is carried out by gathering as many potential risk events as possible based on the type of service through a review of Standard Operational Procedures (SOP) and brainstorming with
Assistant Managers in Ship Service Division, Terminal Services, Loading and Unloading Services, Commercial, Financial and Management system. Risk occurrence is an event that may pose a risk. The research flow diagram is illustrated in Figure 1.

3. Result And Discussion
The results of risk event identification (risk event) are then grouped into operational risk categories then grouped into 9 operational risks as listed in Table 1.
| No. | Operational Risk                        | Definition                                                                 | Category of operational risk                                                                 | Risk Event                                                                 |
|-----|----------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 1.  | Infrastructure and equipment port failure risk | Risks arising from the inability or lack of infrastructure and port equipment to provide services to port service users | Planning and design of port infrastructure is less than optimal                             | a. Reduction of flow / harbor pools of river sediments  
  b. Unoptimal port facility layout |
|     |                                        |                                                                           | Maintenance of port infrastructure and equipment is unplanned and sustainable                | a. Unsustainable maintenance of port infrastructure such as harbor / dock, dock, dolphin, shipping safety facilities, and harbor port facilities  
  b. Maintenance of tugs and unloading equipment unplanned |
| 2.  | Internal fraud risk                    | Risks arising from the act of harming a particular party / agency that is done intentionally for personal or group purposes | Misuse of authority                                                                       | a. Misuse of assets  
  b. Corruption  
  c. Counterfeit statement  
  d. Receiving bribes |
|     |                                        |                                                                           | Theft and fraudulent actions                                                                | a. Mark up the purchase price  
  b. Stealing goods (cheating)  
  c. Stealing money |
| 3.  | Safety interruption risk               | Risks arising from a security breach such as theft, smuggling, and acts of terrorism, damage or destruction. | Theft and extortion / thuggery                                                              | a. Theft by "lawa-lawa" or jumping squirrels  
  b. Illegal charges by thugs  
  Smuggling of illicit goods |
|     |                                        |                                                                           | Smuggling of goods                                                                          | a. Terrorist attacks  
  b. Riot demonstrations  
  c. Inter-group fights |
|     |                                        |                                                                           | Acts of terrorism, riots and destruction (vandalism)                                        | |
| 4.  | Employment and workplace safety risk   | Risks arising from non-compliance with employees related to equal rights, wages, occupational safety and health and work environment. | Discrimination                                                                             | a. Loading unloading labor demonstration on wage increases  
  b. Employee strike |
|     |                                        |                                                                           | Demonstrations and strikes                                                                  | a. Work accident  
  b. Occupational diseases Air pollution  
  c. Increased noise |
|     |                                        |                                                                           | Occupational Safety and Health Disorders and work environment                                | |
| 5.  | IT/system failure risk                 | Risks arising from IT / system failures in fulfilling port services       | Software /hardware damage                                                                   | a. Error application  
  b. Hardware computer damage |
|     |                                        |                                                                           | Cyber Security attach                                                                      | Computer data hacking |
| No. | Operational Risk                                          | Definition                                                                                           | Category of operational risk                        | Risk Event                                                                 |
|-----|----------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------------------|
| 6.  | Risk of damage / loss of physical assets                | Risks arising from the harboring of a port asset from a particular group of people or agencies and the consequences of natural disasters that cause the port to lose assets | Port asset seizure                                   | The seizure of port land by a particular group of people or agencies       |
|     |                                                          | Damage / loss of assets due to disaster                                                              |                                                      | a. Earthquake                                                            |
|     |                                                          |                                                      |                                                      | b. Tsunami                                                                |
|     |                                                          |                                                      |                                                      | c. Fire                                                                   |
| 7.  | The risk of delay in service time and congestion / accumulation of goods | Risks arising from failures meet the standard of service time of the port and the occurrence of congestion / accumulation of goods | Delays meet the standard time of port service       | a. Ship mooring ratio                                                     |
|     |                                                          |                                                      |                                                      | b. Delay time                                                             |
|     |                                                          |                                                      |                                                      | c. Guidance service time                                                  |
|     |                                                          |                                                      |                                                      | d. Pause time                                                             |
|     |                                                          |                                                      |                                                      | e. Ineffective time                                                        |
|     |                                                          |                                                      |                                                      | a. Dwelling time                                                           |
|     |                                                          |                                                      |                                                      | b. Waiting time                                                           |
| 8.  | Risk of failure of contract negotiations and cooperation | Risks arising from failure to negotiate contracts and cooperation with third parties                  | Failure to acquire new / old business due to lack of requirements | a. Missing driving license                                                 |
|     |                                                          |                                                      |                                                      | b. Device operator permissions are off                                     |
|     |                                                          |                                                      |                                                      | c. Inactive equipment operation permit                                     |
|     |                                                          |                                                      |                                                      | a. Vendors are not able to carry out contracted work                        |
|     |                                                          |                                                      |                                                      | b. The quality of work does not match the contract                         |
|     |                                                          |                                                      |                                                      | Authority of general port operations                                      |
| 9.  | Risk of regulatory changes and legislation              | Risks arising from changes in legislation related to port and shipping regulations.                  | Risks arising from changes in legislation related to port and shipping regulations. Changes in legislation on ship voyages | Distribution of import export zones for certain types of commodities       |

The grouping of operational risk is described as a port operational risk structure as described in Figure 2.
Operational risk of port

Internal Factor

Human

External factor

Weather and local climate

Rules and Regulations

Extraordinary events (natural disasters, terrorism, hardships and destruction)

Business process

System/IT

Risks of infrastructure and port equipment failures

Risk of failure of contract negotiations and cooperation

IT/System failure risk

The risk of harassment of port security

The risk of delay in service time and congestion/accumulation of goods

The risk of regulatory changes and legislation

Risk of damage/loss of physical assets

Risk of failure of contract negotiations and cooperation

Employment and workplace security risks

Risk of cheating/internal fraud

Risks of infrastructure and port equipment failures

Risk of damage/loss of physical assets

Risks of infrastructure and port equipment failures

The risk of delay in service time and congestion/accumulation of goods

Figure 2. Operational risk of port structure

4. Conclusion
The results of this study identify the risk structure that occurs in the port consisting of 9 operational risks is infrastructure and equipment port failure risk, internal fraud risk, safety interruption risk, employment and workplace safety risks, IT/system failure, lost and damage physical asset risk, delay and bottlenecks/stacking of goods risk, negotiation contract and partnership failure risk.

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