

IDENTIFICATION OF RISK AS AN ELEMENT OF RISK ASSESSMENT IN LOGISTIC PROCESSES

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Abstract

The aim of each company is, among other things, to manage logistic processes. It is therefore crucial for companies to identify where the risk is, how large it is, how it can affect the activities, process, organization, and what measures need to be taken to eliminate or at least reduce the risk to an acceptable level. Therefore, the risk management process is becoming increasingly important in this respect. The implementation of the risk management process influences the undertaking of appropriate sales actions that will allow, among others, for optimal use of available resources as well as emerging development opportunities. In order for risk management to bring the expected results, it should be implemented after appropriate recognition of disruptions (risk factors) that directly affect its occurrence in logistic processes. Thus, the identification of risk is important here, i.e. identification of disruptions (risk factors) present in the implementation of logistic processes. Risk identification is an important element of the risk assessment stage in the risk management process. The aim of the article is to indicate the essence of risk identification and its significance in the risk management process in the implementation of logistic processes.

Keywords: Risk, risk management, logistic processes, interference in the logistic processes, applications

1. INTRODUCTION

In each company, there is a bundle of processes that are interrelated and all together contribute to the added value that the company offers. Their improper functioning disturbs the effective operation of the entire company, hence the importance of proper management of processes, including their continuous monitoring and improvement. This is of great importance also in relation to logistic processes occurring within each company. Logistic processes support the functioning of the management system and ensure its effectiveness and efficiency. These include both activities and operations related to the preparation of infrastructure for basic processes, management, development of information systems, transport, storage, accounting and finance, reporting and controlling. Therefore, they directly affect the implementation of set goals, both long and short-term, i.e. they are closely related to the overall activity of the company, but do not create independent spheres.

The implementation of logistic processes in manufacturing companies refers to the support of the main production process, so their reliability is of great importance, because transport, storage, packaging and other logistic processes are the most vulnerable to disruptions [2,6]. In every manufacturing company there are different disruptions in the logistic processes, which depend mainly on the specificity of the production activity. From the point of view of logistic processes, the most important thing is the division into disruptions on which the company has an influence and thus can control them and risk factors independent of the company - which it has no influence on.

The same disruptions in different companies are likely to occur with different degrees of probability and have different degrees of potential impact. Thus, in order for risk management to produce expected results, it should be preceded by the identification of disruptions in logistic processes, which should be considered individually in a given company [7].



The aim of the article is to indicate the essence of risk identification and its significance in the risk management process in the implementation of logistic processes. The study assumes that the concept of disruption will be used as a natural reference to the logistic processes implemented, instead of using the concept of risk factor.

2. RISK MANAGEMENT PROCESS - GUIDELINES ACCORDING TO THE PN-ISO STANDARD 31000:2012

According to E. Pięła [9], risk management in logistic processes is defined as a set of causally related and consecutive actions that are carried out in a given company in the space-time dimension, characterized by a specific repeatability. In addition, risk management requires the development of specific procedures, documenting the decisions taken, as well as the maintenance of appropriate control paths, as demonstrated by international risk management standards such as COSOII:2004, FERMA:2002, AS/NZS:2004 and the PN-ISO 31000:2012 standard [3].

The article is based on the risk management process according to the PN-ISO 31000:2012 Standard, which includes guidelines for systemic risk management, therefore it can be applied in a company that encounters a broadly understood risk on a daily basis. The main objective of this standard is to unify risk management processes, regardless of the specificity of the industry or sector. The risk management process according to this standard is shown in **Figure 1**.

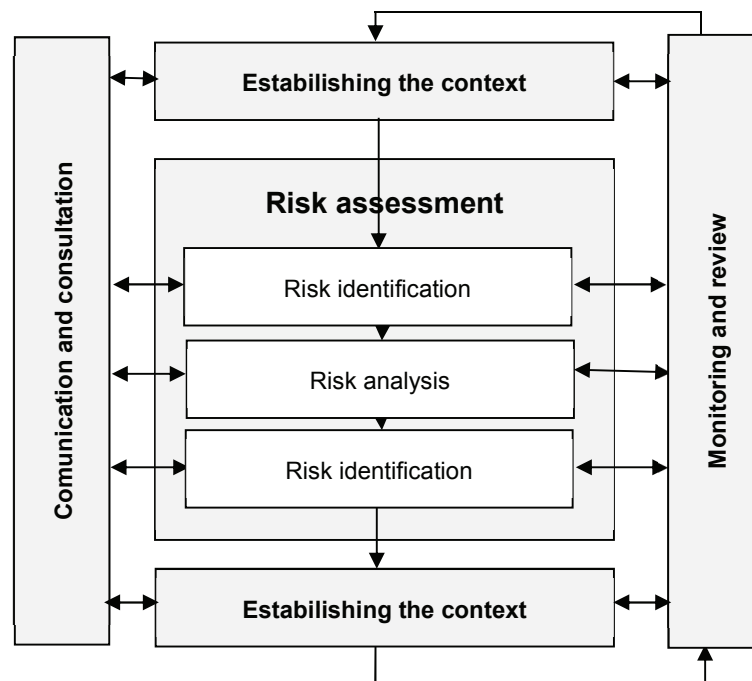


Figure 1 Risk management process [11]

As shown in **Figure 1**, one of the important elements of the risk management process is risk assessment, which forms the overall process of risk identification, risk analysis and risk evaluation. The article focuses on the identification, which main objective is to create a list of possible disruptions in the implementation of logistic processes based on events that may disrupt the achievement of objectives or pose a threat to the existence of a given company.

3. THE ESSENCE AND PURPOSE OF RISK IDENTIFICATION IN LOGISTIC PROCESSES

Due to the development of science, issues related to risk management are increasingly becoming the subject of considerations in the field of management, economics, logistics and marketing [8].



In logistic processes, risk is defined as the combination of the probability of disruption and its negative impact. On the other hand, risk management of logistic processes is a set of causally related and consecutive activities carried out in the company in a space-time dimension, characterized by a certain repeatability. In addition, risk management requires the development of specific procedures, the documentation of decisions taken and the maintenance of appropriate control routes.

Logistic processes are one of the most cost-creating processes that are carried out in manufacturing companies. The time of introducing new products to the market is becoming so short that companies need to continuously improve and strengthen the value creation process. The logistic processes determine the ways of using the products, satisfaction, convenience, comfort, as well as assistance in solving customer problems. Through logistic processes, companies realize values and benefits on the market to a significant extent, which contribute both to customer value and to the added value of the company. For this reason, activities in logistic processes should be organized in such a way as to reduce the probability of disruptions, while at the same time ensure an adequate response to the existing disruptions in order to reduce their negative effects.

In the literature, disruptions are defined as any unexpected events that have a destructive effect on the system and cause a change in the state of the system in directions far from the state of equilibrium or the purpose of the activity [5]. As a result, the implementation of logistic processes in manufacturing companies, due to occurring disruptions, is extremely important and should be considered from the point of view of risk management.

The main task of the risk approach is risk identification, the purpose of which is to determine the disruptions (risk factors) to which the given company is exposed [4].

In logistic processes, risk identification is a process of discovering potential disruptions affecting the implementation of logistic processes in a company. The aim of risk identification is to create an exhaustive list of disruptions resulting from possible events in order to identify the types of disruptions and the degree of risk to the company. **Figure 2** shows the types of actions taken to identify risks in logistic processes.

Risk identification in the implementation of logistic processes Implemented measures	
Determining disruptions in implemented logistic processes	Identification of potential consequences
Risk identification methods in logistic processes	

Figure 2 Types of actions taken to identify risks in logistic processes [own study]

In the stage preceding the identification of risk, i.e. determining the context, the logistic processes carried out in the company should be specified. Also, the risk management criteria should be determined, i.e. the scale of probability of occurrence of the disruption and its effect. It is also necessary to establish the levels of risk and the so-called risk map.

The identification of risks in logistic processes determines the disruptions (risk factors) in their implementation. The analysis covers both internal and external disruptions affecting the logistic processes in the company. The acquisition of this information should focus on the circumstances that may affect the achievement of the set objective.

The condition for the effectiveness of the risk identification process, and thus the risk management process, is to gather as much information as possible about any disruptions in the implementation of logistic processes.



Acquisition of relevant data and its proper processing leads to the improvement of the level of information for the company. Various methods are used in order to obtain information on the disruptions affecting the implementation of logistic processes, which are often based on the knowledge and experience of the owners or managers of a given company. The ability to choose the right methods of risk identification in logistic processes is difficult and requires great flexibility, knowledge and experience in making decisions.

4. CRITERIA FOR THE SELECTION OF RISK IDENTIFICATION METHODS IN LOGISTIC PROCESSES

The choice of a single method for risk identification in logistic processes may not be sufficient to provide a clear and complete picture of disruptions in logistic processes. It should be borne in mind that the use of too many risk identification methods may lead to dispersion or loss of data.

According to A. Szymonik [10], the risk identification, taking into account the logistic processes, can be carried out in relation to:

- design and manufacturing process - the disruption may be related to the availability of human, physical and financial resources, infrastructure or instrumentation that are necessary for the designing and manufacturing of the product,
- supply process - the disruption can be seen from the point of view of the contract implementation depending mainly on: supply of materials, specific services, sources of supply and the consequences of their application,
- technical process - the disruption occurs when the problems turn out to be more difficult to solve than expected. This is reflected in the design, implementation and cooperation of parts and components.

Identifying risks in logistic processes requires the definition and application of a wide range of methods and tools enabling precise diagnosis of threats occurring in logistic processes. **Table 1** presents selected methods and techniques of risk identification in the implementation of logistic processes.

Table 1 Selected methods and techniques used to identify risks in logistic processes, study based on [1], [10]

Selected methods and techniques of risk identification in logistic processes	Characteristics
Brainstorming	Identifying possible risks and potential ways to improve quality.
Preliminary Hazard Analysis Method (PHA)	Creating a checklist with questions that can be answered in a simple and general way to identify risks.
FTA, ETA, CCA tree analysis	Presentation in the form of a tree combinations and mutual dependencies between potential defects, as well as sequences of events that have an impact on the implementation of the product.
FMEA - Failure Mode Effects Analysis	Determination of the relationship between the causes and effects of identified hazards (defects) and optimization of actions and costs.
QFD method	Determination of numerical values and classification of data related to: - customer requirements and technical parameters of the product, - technical parameters of the product and their relations, - hierarchy of parameters, - competition analysis.
Process diagram	Presentation in the form of a block diagram the algorithm of subsequent stages of the process, links between technological operations, processes, etc.
Control card	Identification of risks arising from variability. This method requires the process to be sampled at regular intervals.
Analytical sheet	Collection and organisation of measurement and observation data for recording and initial processing of source information.



Table 1 (continue)

Pareto-Lorenz chart	Presentation of the graphical distribution of types of errors, problems or their causes. The Pareto-Lorenz analysis is based on the regularity that 20-30 % of the causes determine 70-80 % of the effects.
Ishikawa diagram	Identifying the problem, identifying its causes and classifying individual causes into appropriate groups.
Point correlation diagram	Presentation of rectangular pairs of variables in the coordinate system, which may be connected with each other by a certain dependence.
Value stream map	Analysis and improvement of value flow in the company, which consists in determining informational, material and physical elements flows in the area of company's production, which allows for identification and understanding of the entire production process and its subsequent improvement.

In order to identify risks in logistic processes, specific methods are used due to their characteristics, complexity and specificity of particular stages of the logistic process. Regardless of the choice of method, the final result should always be taken into account. Each risk identification method should be assessed against comparable criteria in order to assess its effectiveness.

5. CONCLUSION

Each company should strive for effective management of logistic processes, which mainly require the development of procedures, documentation of decisions taken and preservation of visible control paths.

In order for risk management to produce the expected results, it should be implemented after learning about the disruptions directly affecting the implementation of logistic processes in a given company.

Systematic risk identification as well as the use of appropriate control mechanisms contribute to the protection of the company against the surrounding disruptions. Every logistic process is burdened with a certain risk. The application of the selected risk identification methods in logistic processes will contribute to its reduction to an acceptable level.

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