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IMPROVEMENT OF RISK MANAGEMENT SYSTEM IN SUPPLY CHAINS

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Globalization and development of market relationships require reliable supply chains. Risk situations can lead to destruction of the whole supply system and in order to minimize that a lot of companies have specific programs of risk management. So we should have more detailed information and improve our knowledge about this theme.

Any organization has a lot of risk situations which can lead to financial losses or generate more revenue. The theme of risk management is quite important nowadays because of necessity to minimize costs and improve the profitability of a logistic company. Risk management system in supply chain makes it possible to identify the most vulnerable elements, choose effective and constructive way to optimize problems and get rid of all risks. In reality, it is virtually impossible to list every conceivable risk, and identification highlights the most significant ones that affect the supply chain. Inter-organizational people usually have the most intimate knowledge of their own organization and its conditions, but not necessarily the capability to identify risks. Organizations cannot rely on personal knowledge and informal procedures, but need more formal arrangements.

There are a lot of risks in supply chains and they depend on logistic operations (transport, purchase, warehousing), technologies, ways of development and many other factors.

It is really essential to distinguish between logistic risks and risks in supply chain. Logistic risks occur in different levels of logistic system when we deal with numerous logistic operations such as transportation, warehousing, materials handling, inventory management and can cause problems in material, finance and information flows. Risks in supply chain are the set of problems that we can have due to external and internal factors and that can cause destruction of one or several elements in supply chains.

Nowadays there are a lot of ways of risk assessment and most of them allow investigating processes and procedures, reasons and consequences of ricks, but also there are some disadvantages. Some of the most important problems are labour intensity, sometimes high costs and necessity of having detailed documentation.

The article is devoted to issues of risk management at the enterprise Belshina JSC.

Belshina JSC is one of the world's largest tyremakers. The company develops, markets, and sells more than 300 sizes of tires: tyres for passenger cars, truck tyres, tyres for electro transport, and tyres for tractors and agricultural vehicles.

The enterprise cooperates with resident and non-resident companies using sales transactions. The enterprise has multimodal supply chain that's why we can see a lot of risks. It is necessary to carry out SWOT analysis that consists in the identification internal and external factors and mapping the results.

SWOT-analysis shows that the most dangerous risks are non-conforming deliveries of cargo, unreliable foreign machinery and unreliable delivery.

The most suitable way to reduce all risks possibilities of unreliable foreign machinery is accurate analysis of suppliers and manufacturers, also it is necessary to do marketing researches and have tender between suppliers.

Deliveries of non-conforming cargo were assessed by analysis of human factor.

Calculations of possible operator mistakes will be shown further.

1) The wrong description of raw materials can be accounted according to the formula (1):

$$R = \frac{p}{n}, \quad (1)$$

where R – possibility of risk situation;

P – amount of real cases during the year;

N – the whole amount of purchases during the year.

According to the formula (1):

$$R = \frac{2}{37} = 0{,}054 \text{ or } 5{,}4\%$$

2) Computer program failure is accounting according to the formula (2):

$$R = \frac{P}{N}, \quad (2)$$

where N – the amount of working days.

According to the formula (2):

$$R = \frac{40}{255} = 0{,}1568 \text{ or } 15{,}68\%$$

3) The wrong materials accounting is showed by the formula (3):

$$R = \frac{P}{N_s}, \quad (3)$$

where N_s – the amount of non-planed stocktakings during the year.

According to the formula (3):

$$R = \frac{1}{4} = 0{,}25 \text{ or } 25\%$$

Quantitative assessment shows that risk of non-conforming cargo deliveries with probability 15.36%.

Risk of unreliable delivery is the most serious and dangerous problem nowadays at the enterprise Belshina JSC. The process of research has showed that it would be feasible to use quantitative assessment to the accounting the reliability of the delivery goods.

Calculation of risk indicators and reliability of delivery was carried out for three material flows, consisting of transportation of butadiene-styrene synthetic rubber, natural rubber and anode cord.

New method of accounting showed that the most dangerous delivery connected with synthetic rubber. There are results of analysis at the table 1.

Table 1 – Results of the material flow analysis

The level of responsibility	Intervals of responsibility levels to *synthetic rubber*	Necessary changes
1	$0 \leq K_{N_1}^{all\ risks} \leq 0{,}84$	Implementation of the fine system
2	$0{,}84 \leq K_{N_1}^{all\ risks} \leq 0{,}88$	Absence of an operational management
3	$0{,}88 \leq K_{N_1}^{all\ risks} \leq 0{,}92$	Stimulation

At the end of the research the integrative indicator of all risks were 0.7, that's why the level of responsibility was 1. According to the results it would be feasible to use implementation of the fine system when trucks with cargo late and it is non-fulfillment of transport obligations under contracts.

In order to improve the program of the risk management it is proposed to distinguish three stages: preparatory, main and final parts.

At the preparatory stage staff of the company should carry out forecasting and planning. Specialists collect necessary information and documents to find the most suitable way of risk assessment.

The main part directly concludes the concept of supply chains elements evaluation and further activities to reduce risk possibilities at supply chains.

The final part helps, due to information that specialists have found out earlier, to make a decision how we can impact on risks and prevent the same situations in the future.

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