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Risk Management Processes in Supply Chains

Abstract: *One of the keys of successful business last few years is effective dealing with risks in every meaning of that word. At the time when the world economic crisis largely limits business, successful Risk management is the only way of survival for a large number of business systems. This paper will present the processes of risk management in supply chains that are in accordance with the standards ISO 28000 and ISO 31000. By implementing a holistic, enterprise-wide supply chain risk management program, companies also can uphold their commitment to providing strong corporate governance on behalf of stakeholders and increase their market value.*

Keywords: *Risk management, Supply chains issues, Risk treatment*

1. INTRODUCTION

Risk management (RM) is a process that considers every reasonable activities of man and we can say that it exists from the moment when the man started to decide, plan and execute various activities, as an individual or the wider human community. Implementation of RM in the supply chains is an area with great potential for practical work and presents field where can be achieved significant results.

According to Christopher (1992) Supply chain is network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer.^[1]

Supply Chain Risk Management is a structured and synergetic process throughout the supply chain, which seeks to optimize the totality of strategy, processes, human resources, technology and knowledge. The aim is to control, monitor and evaluate supply chain risk, which will serve to safeguard continuity and maximize profitability.^[2] In order to fulfill its business goals, business systems are very dependent on the partners in the supply chain and the impact of any link in the supply chain. In order to ensure the achievement of their

organizational goals, business systems aim to fully understand all the events and uncertainty that could affect any point in the supply chain.

2. DEFINING PROCESSES

Business information flows should be integrated in a way that is consistent regulations, standardization and harmonization. Integration of reporting mechanisms during the process of risk management brings multiple benefits, in addition to bring compliance of business processes and increase efficiency. Risk management processes are identified by standard ISO 31000.

The supply chain organization should establish internal mechanisms of communication and reporting. They should include procedures for the consolidation of risk and information from different sources within the organization.

Organizations should also develop and implement a plan that will communicate with external stakeholders.^[3]

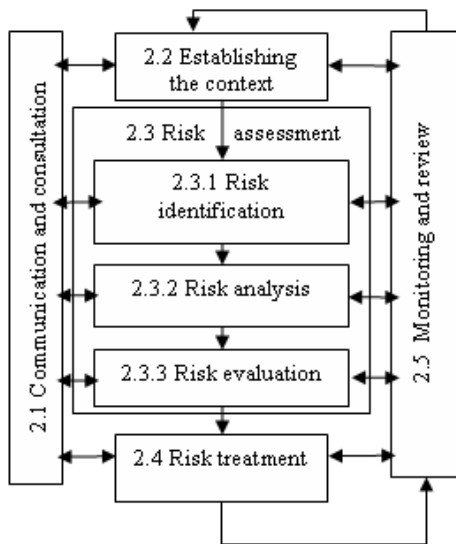


Figure 1 – Risk management processes

2.1 Communication and consultation

In the processes of risk management communication and consultation with internal and external interest parties should be present in each phase as much as is necessary. Plan for communication and consultation with internal and external stakeholders should be developed in the early stage. This plan should address issues relating to the risk itself, its consequences and answers to manage it. During the process of communication and consultation with stakeholders it is important to bear in mind that they have opinions about the risk on the basis of their perception of risk. As their opinion may have a significant influence on the decision, it is important to identify it, record and take into account in the decision-making process.

2.2 Establishing the context

Establishing of context make organization defines internal and external parameters that should be taken into account in risk management and the scope of risk and the criteria for the process selection. Context should be associating with internal and external parameters relevant for the organization.

2.3 Risk assessment

Risk assessment is the overall process of

risk identification, risk analysis and risk evaluation.

2.3.1 Risk identification

It is often useful to consider categories of risks as a starting point to guide organizations in an initial assessment of their supply chains. Many authors have their own opinion of identifying Supply chain risks. Thinking broadly, risks in supply chains can be identified as:

- Organizational risk
- Network risk
- Environmental risk^[4]

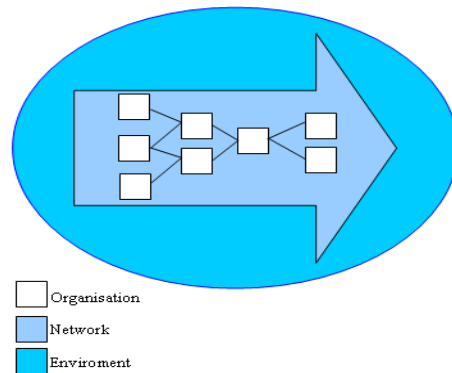


Figure 2 – risks in supply chains

Risks can be seen as internal or external to the focal firm, and be seen as internal or external to the supply chain^[5]:

- Process risk
- Control risk
- Supply risk
- Demand risk
- Environmental risk

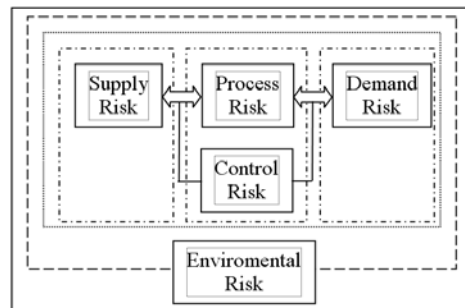


Figure 3 – risks in supply chains

AMR Research is company that provides

comprehensive research and advisory services for supply chain and IT executives. AMR Research regularly surveys global companies to measure the levels of risk in their global supply chains, gauge the regions that contribute the most significant risks, and analyze the impact of these risks on how they manage their business. Based on their research we can conclude that importance of specific risk changes over time. The most significant risks in 2006 were:

- Supplier failure (28%)
- Strategic risk (17%)
- Natural disaster (15%)
- Geo-political events (11%)
- Regulatory risk (11%)
- Logistics failure (10%)
- Intellectual property infringement (7%)
- Other (1%) .^[6]

In the most recent survey, conducted in October 2008, AMR asked 130 global companies about the risks that they face in their supply chains. These are results:^[7]

Top three Supply Chain Risks (October 2008 survey results)			
RISK	RANK		Compared to May 2008
Rising energy costs	1	45% of the respondents identified this risk as the top risk	No change
Rising transportation costs	2	42% of the respondents identified this risk as the top risk	The level of risk went down by 9 points, 51% to 42%
Commodity price volatility	3	38% of the respondents identified this risk as the top risk	The level of risk went down by 5 points, 43% to 38%

Table 1- Top Supply Chain Risks according AMR research

2.3.2 Risk analysis

Risk analysis involves consideration of the causes and sources of risk, their positive and negative outcomes, and the likelihood that the consequences may appear. It is believed that the risk is analyzed by determining the probability and its consequences.

The way in which the consequences and the probability are stated in order to determine the degree of risk, depends on the type of risk, available information and purpose of risk assessment output is carried out. It is also important to pay attention to the interdependence of the various risks and their sources.

It is possible to determine the consequences of modeling the outcome as one event or events, or analyzing experimental studies or from available data.

Event may have multiple consequences that may affect more goals.

The purpose of risk evaluation is a help in decision-making, based on the results of the risk. Another objective is to define the priorities of the treatment implementation based on the level of risk which need treatment. Risk evaluation includes a comparison of the level of risk according to criteria that are taken during the establishing the context. If the level of risk does not meet risk criteria, the risk should be treated.

2.4 Risk treatment

Risk treatment is the process of identifying opportunities for treatment and control. The goal of this activity is finding ways to reduce or eliminate negative consequences and reducing the occurrence of negative probability. Risk treatment activities also aim to strengthen positive outcome of business processes. It's not often possible to implement all the strategies of treatment or it's not cost effective solution. Business owner or Board of Directors should decide what priorities in risk treatment are and make the implementation of the most relevant combination of risk treatment solutions.

2.4.1 Early intervention approach

Every company should focus on early intervention rather than crisis management. This supposes to be incorporated throughout

the risk management structure.^[8] This way of thinking does not include only policies, procedures, and governance, it's related to the philosophy of the risk treatment by the whole company. Basic characteristics of this approach are:

- Essence of Risk assessment is aggregating and prioritizing leading risks and estimation of their probabilities and impact
- Risk response is based on comparing this knowledge of risk to tolerance levels, company should react promptly
- Risk monitoring basis is evaluating the performance of risk treatment continuously as new informations become available
- The improvement is achieved by the constant identification of performance gaps and finding solutions to overcome them.

2.4.2 Dealing with top risks of Supply Chains

Supplier failure-

According to data from the 2006 most significant risk in the supply chain was Supplier failure. **PricewaterhouseCoopers** discusses how supply chain disruption can destroy shareholder value and corporate profitability. Their opinion is that companies must invest in enhancing the integrity of their supply chains, in a manner which balances operational objectives and risk management. In today's business world there is a variety of supplier relationships and different forms of interconnection of suppliers and the core organisation. Because of obvious threats to business of supply chain, it is necessary to keep the work in accordance with the processes that will reduce risks when selecting suppliers and work with them.

Supplier selection is very important operational decision. Company should align business objectives with suppliers and establish key risk indicators. It is appropriate that the decision-making process of supplier selection is based on the following criteria^[9]:

- Quality personnel
- Quality procedure
- Concern for quality
- Company history
- Price relative to quality

- Actual price
- Financial ability
- Technical performance
- Delivery history
- Technical assistance
- Production capability
- Manufacturing equipment.

After selection, there is a need to constantly monitor and track the work of suppliers to do the evaluation. Most of the attention is needed to make these activities successful:

- Analysis of business environment suppliers
- Permanent analysis of indicators of risk.

If there is a need for corrective actions, the company can bring in alternative suppliers which can be crucial in some occasions. One of the best explanations of this is case of Nokia and Eriksson. Fire destroyed an electronics component plant in New Mexico in 2000. Nokia Management team has reacted very quickly. They secured components from the market and Eriksson was left with supply shortages which translated into lost sales estimated at \$390M.

Rising energy and transportation costs-

As market conditions show that direction of impact of rising energy costs isn't pointed to customers and suppliers but the manufacturing companies, the reality becomes clear. High costs of energy and material are reality and the manufacturing companies must take action in their supply chain to maintain sustainability.

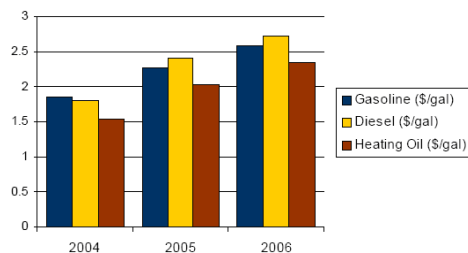


Figure 4: Every major energy source used by manufacturers has increased over past few

Source: US Dept. of Energy

Better use of resources in logistics and transportation can be a certain help in solving the problems of increased costs of fuel and energy.

During the implementation of risk

treatment process successful companies have come to certain solutions that were subsequently implemented. Examples of actions taken to reduce or eliminate the risk include:

- ensuring fully loaded transport equipment
- reduction in part load orders
- optimization of delivery frequency to maximize full loads
- consolidation of the number of suppliers
- increased frequency of reviewing fuel surcharges to support supplier's viability
- reviewing and changing the total distribution network design to factor in increased fuel costs
- improving driver training to improve efficiency of delivery costs versus shortest delivery time.^[10]

2.5 Monitoring and review

Monitoring and review is an ongoing part of risk management that is integral to every step of the process. It is also the part of risk management that is most often given inadequate focus and as consequence of that programs of many agencies become ineffective over time.

This part of Risk management ensures that the important information generated by the previous processes is captured, used, and maintained.

Distinctions between Monitoring and review are important in the context of risk management:

- Monitoring is the ongoing process of oversight of internal and external environment.
- Review is a process that is described as more periodic process that is

focusing at the current status or situation.

3. CONCLUSION

In this paper, we have presented the main processes of risk management in supply chains. We were analysing issues that were addressed to main risks and we gave conclusions about their treatment processes.

By observing the world economy today it is becoming increasingly clear that traditional supply chain management approaches must be enhanced in way to become capable to deal with the new uncertainties and issues which are arising from new market trends.

A company that manages Supply Chain risks effectively has the advantage over the competition. The Benefits of Managing Supply Chain Risk are:

- Better decisions making
- Better balance between opportunity and threat
- Fewer surprises
- Reducing costs
- Effective selection of suppliers.

Even the best-organized supply chain can't expect to predict all future events and disruptions. However, proactive supply chain executives are trying to focus on optimizing decisions and processes across the entire supply chain in order to gain clear benefits. To deal with supply chain impacts associated with various types of risks (uncertain consumer demands, and unpredictable natural and man-made disasters), many researchers have developed different strategies for managing supply chain risks.

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