

New challenges and comprehensive risk management approaches in modern supply chains

Gyula Hegedűs, Kirilka Peeva-Müller

Abstract—The highly specialized processes of modern supply chains, the diverse geographic distribution of suppliers and the complex electronic control systems are posing numerous new threats to companies in a global market environment more competitive than ever before. This article is about the risk-related challenges corporations face today as well as about the methods and practices they should consider applying in order to ensure the continuity of their daily operation and their supply chain in particular. In the introduction we present the current trends and fundamental challenges regarding modern supply chains. In the next chapter we introduce the method of ITBCP as a relatively new, but highly useful tool of managing IT-related operational risk factors and provide a high-level comparison with classic BCP methodologies. The third chapter is about the new challenges companies face in regard to various operational risks, while the fourth chapter briefly describes the most commonly used techniques of identifying and managing these threats. The last chapter serves as a conclusion, a summary why corporations need to take sophisticated preventive measures in order to minimize their risks threatening operational continuity.

Index Terms—business impact analysis (BIA), global challenges, IT business continuity planning (ITBCP), just-in-time (JIT), risk management, supply chains

I. INTRODUCTION

CAN we precisely tell the amount of risk a large enterprise bears by not paying adequate attention to ensuring its operational continuity? Do we know about the risks threatening its business operations? Do we know about the nature and size of losses that may occur for each particular business area in case of any threat causing significant negative effects on the productivity of its resources?

The root of the problem is that companies are unable to answer these types of questions without executing proper in-depth systematic analyses on a regular basis. One possible consequence of this lack of knowledge is that organizations get exposed to an increasing number of risk factors making

them vulnerable in a number of different, unknown ways potentially causing severe unexpected downtime.

As corporations are innovating and developing faster than ever in the course of history, the number of potential risk factors is increasing proportionately with the application of the more advanced, more sophisticated and more complex technologies infiltrating into all areas of the business. Always keeping one eye on the risks and having an up-to-date risk management plan for unexpected crisis situations can often mean life and death in the extreme competitive world we live in today. A leading-edge company can't afford regular unexpected outage of its resources, since it can lead to losing the competitive advantage over a competitor who pays greater attention to keeping its risks on a manageable level.

That is particularly true for modern supply chains, where cost and time became the two factors that are more important today than ever before. The increasingly popular just-in-time (JIT) methodology is just one of the several ways of cutting costs and optimizing the supply chain by reducing the amount of goods and materials a firm holds in stock in one moment in time, while other time management techniques of the lean methodology help companies in delivering to its clients faster and in a more reliable way.

One of the great examples of modern supply chain management is the automotive industry. Cars are an example of global products containing research and design features which involve the collaboration of experts of various nations. The components are usually produced in many separate locations and involve a range of assembly and sub-assembly activities [1]. They are likely to meet at a final assembly line, where parts from all across the world are waiting to get installed in the particular vehicle they were ordered to several months earlier. Such an extremely interdependent system can't tolerate unexpected downtime, thereby paying constant and profound management of operational risks in the supply chain is critical business success.

II. THE CRITICAL ROLE OF ITBCP IN SUPPLY CHAINS

As it is already obvious it's impermissible for a large corporation to fall out of its normal way of operation for a significant amount of time, which considering the increased competition as well as the high technological dependency becomes shorter every day. Business continuity is endangered by increasingly less transparent threats, due to the complex partnerships with suppliers, the increasingly complex

Manuscript received May 15, revised June 4.

Gyula Hegedűs is the Head of Business Analytics Department at KÜRT Information Management and Data Recovery Co. in Budaörs, Hungary (e-mail: gyula.hegedus@kurt.hu).

Kirilka Peeva-Müller is an Associate Professor of Management at KBTU Business School in Almaty, Kazakhstan and a Visiting Lecturer in Management Skills at the International Business School in Budapest, Hungary (e-mail: kira.mueller@gmail.com).

New Challenges and Comprehensive Risk Management Approaches in Modern Supply Chains

technologies and the increasing IT and telecommunications support necessary for the daily operation of different business processes.

A business continuity strategy should ideally address all possible areas of a company where a failure or resource outage could cause significant damage or operational disruption, and achieving the desired KPIs becomes simply impossible. As almost all major processes concerning supply chains today are based on different IT-related resources and services, within the general business continuity the IT-oriented business continuity (IT Business Continuity Planning - ITBCP) bears more weight day by day.

As a result of a series of modernization projects supply chain management systems are able to control the processes with minimal human intervention, if the necessary resources and functions are continuously ensured. However a failure of the system or its electrical or IT components can directly set back the supply chain processes, or worse, the loss of stored data which can cause even greater problems.

The methodology for executing an IT-focused business continuity planning project is highly similar to that of a regular BCP project, yet the pool of resources to be examined as well as the list of threats and the content of the action plans will be significantly different. Critical processes and resources should be identified with the help of a thorough business impact analysis, the result of which should serve as the basis for determining the list of scenarios for developing the action plans. Apart from the detailed and operative description of duties that need to be performed in case of a crisis event the plans should also include the preparatory tasks required to run the alternative work process, as well as the duties of the aftercare phase in order to make sure all the data are loaded back into the systems once it's again up and running.

III. EMERGING RISK FACTORS AFFECTING SUPPLY CHAIN STABILITY

The unstable global economy we have experienced in the last couple of years has multiplied supplier failures worldwide, thereby assessing and continuously monitoring suppliers' likelihood of potential financial failure has also become more important than ever. The process of regularly assessing and identifying critical suppliers that are most critical to the business has become an everyday routine for most successful corporations, and generating business continuity plans for supplier failure scenarios has also been the general practice in the last several years. Identifying key risk indicators and setting up early warning signals is essential to preventing or mitigating the impact of supply chain breakdowns. Since no matter what the root cause of such a disaster is, the public will always hold the company that owns the brand accountable for the negative event [2].

Adapting to shifts in the market – such as high currency fluctuations or quick changes in demand – has also become a major difficulty corporations need to tackle every day; the company most successful in foreseeing and reacting to rapid market events might be the one leading the market ahead of its competition sometimes for years to come.



Fig. 1. General categories of business risks affecting supply chains

Global sourcing has been the trend for the last two decades in a number of different sectors, however numerous threats have emerged in the recent years that have not been thought about when choosing this form of operation in the first place. These include the constantly increasing wages in developing markets, the increasing costs of logistics due to the increase of oil prices and the growing price of services such as translation, legal fees and licenses [3]. Usually the savings are much smaller today than they were in the time of setting up this form of operation. The types of risks most frequently associated with global supply chains can be related to distance, communicational difficulties and cultural differences.

Understanding cultural differences are one of the most critical factors corporations need to manage when considering operating a global supply chain. In the western world generating profit is usually the fundamental goal behind most business decisions. Companies always try to employ the optimal number of people to get the job done effectively. However, in some parts of Asia, the mentality is to keep as many people employed as possible no matter how little they are contributing to the overall goal. Companies setting up operations for example in China must precisely verify production capacities and workforce quality to ensure that everyone has a meaningful job. Another example is Central America, where workers may refuse to work until an exorcism has been performed in the premises they think may be haunted by ghosts [4]. When evaluating a target country for outsourcing particular parts of the operation it's not enough to analyze the region's political and legal environment, it's also crucial to get as much information as possible about the local habits, traditions and religion. Not taking these into consideration will lead to the emergence of various unknown risk factors that can cause serious headache for the top management and in some cases undermine the complete operation in a foreign country.

IV. IDENTIFYING AND MANAGING RISKS

Identification is the first, yet the most fundamental step in any risk management methodology. Once a certain risk has been identified it becomes a so-called "known" risk. Known

risks can be assigned to different resources or processes, a probability of occurrence and a potential impact can be estimated with the help of various techniques. Unidentified risks can be called “known unknown” or “unknown” risks. The former can be managed using contingencies, while the second is totally unknown and therefore isn’t possible to prevent and consequently to manage. A challenge during a risk identification process is to reduce the presence of unknown risks, thereby enhancing the effectiveness and accuracy of the company’s risk management plan.

There are four fundamental ways of managing known risks:

- 1) *Risk Avoidance*: Completely avoiding the activity that poses the potential risk. While it might sound attractive at first glance, it will likely forfeit most potential gains that would come with the particular resource or activity, thereby applying it requires careful analysis of all possible outcomes.
- 2) *Risk Reduction*: This is the classic idea of reducing the extent or possibility of a potential loss. This can be done by increasing precautions or limiting the amount of risky activity.
- 3) *Risk Transfer*: Risk is transferred to a third-party entity (usually to an insurance company). In this case the probability of occurrence or potential impact is not reduced in any way, only the financial responsibility is transferred to the external party.
- 4) *Risk Retention*: It simply means accepting the risk. It’s usually effective in case of smaller risks that don’t pose a significant financial threat to the company [5].

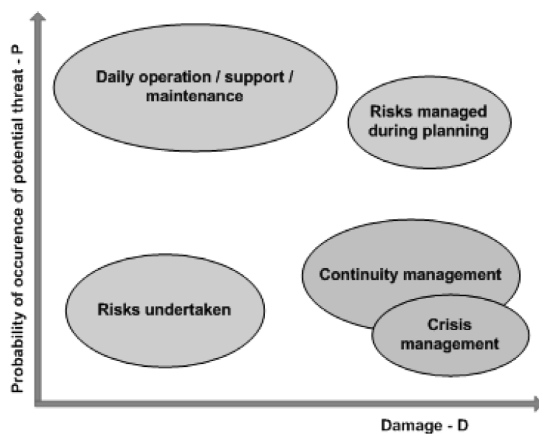


Fig. 2. Types of risk management measures required under different circumstances

Business continuity planning – a method touched upon earlier in this article – is a classic example of risk reduction. After risks, potentially affected resources and critical business processes have been identified with the help of a business impact analysis, alternative working methods are prepared to enable the continuity of processes crucial for normal operation. This way the financial loss resulted from the incident is significantly less than if the affected business processes stopped operating for the entire length of the breakdown. It’s clear to see why taking preventive measures is such an important factor in risk management, while corrective measures (actions need to be performed once a risk has

already occurred) should be kept at a minimum possible level in order to minimize the potential loss a threat poses to the everyday operation (and financials) of a company.

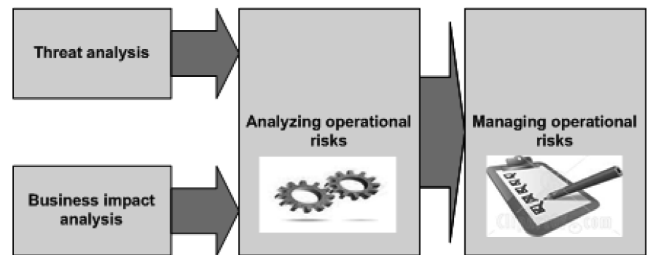


Fig. 3. Classic operational risk management workflow

V. SUMMARY

It is crucial for any company today to minimize the number of unplanned outages in their supply chains as well as the time spent with unscheduled troubleshooting and maintenance activities in order to meet the extremely high requirements set by the industry’s other players in an environment more competitive than ever before.

In the same time supply chain processes, geographic distribution of suppliers and supporting electronic control systems are becoming more and more complex and interrelated, therefore business continuity is threatened by new, less transparent and more diverse risk factors every day. Business and supply chain continuity cannot be achieved by itself, today companies need highly sophisticated and regularly updated risk management strategies in order to meet the high industry standards required to stay competitive in the market.

ACKNOWLEDGMENT

This publication has been supported by the European Union and Hungary and co-financed by the European Social Fund through the project TÁMOP-4.2.2.C-11/1/KONV-2012-0004 - National Research Center for Development and Market Introduction of Advanced Information and Communication Technologies.

REFERENCES

- [1] “Managing the supply chain for globally integrated products” – Available at: <http://businesscasestudies.co.uk/exel/managing-the-supply-chain-for-globally-integrated-products/just-in-time-and-lean-production.html>
- [2] “Supply chain risk assessment”, PwC’s KnowledgeLine, June 2009 – Available at: http://www.pwc.com/en_GX/gx/pharma-life-sciences/pdf/supply-chain-risk-assessment.pdf
- [3] Barry Cross, Jason Bonin, “How to manage risk in a global supply chain”, Ivey Business Journal Nov/Dec 2010 – Available at: <http://iveybusinessjournal.com/topics/strategy/how-to-manage-risk-in-a-global-supply-chain>
- [4] Scott Hudson, “Cultural Effects on the Global Supply Chain”, April 2005 – Available at: <http://scm.ncsu.edu/scm-articles/article/cultural-affects-on-the-global-supply-chain>
- [5] “Ways of managing risks”, Mays Financial – Available at: <http://www.maysfinancial.com/insurance/ways-managing-risk/>

New Challenges and Comprehensive Risk Management Approaches in Modern Supply Chains



Gyula Hegedűs received his B.Sc. degree in economics from the Corvinus University of Budapest and his M.Sc. in IT management and M.B.A. degrees from the Central European University Business School in Budapest, Hungary.

He has been working as a senior consultant for a number of years specialized in business continuity planning in the CEE region. By having extensive experience in the governmental, commercial and manufacturing sectors he has lead projects and successfully implemented complete business continuity management systems at a number of different corporations and participated in the development of a unique business continuity method designed specifically for manufacturing environments.



Kirilka Peeva-Müller is an Associate Professor of Management at KBTU Business School in Almaty, Kazakhstan and a Visiting Lecturer in Management Skills at the International Business School in Budapest, Hungary. She specializes in management and innovation development with particular focus on transition economies; her fields of work include researching the risks regarding the human factor in today's corporate environments.