

Continuity of activities for railway undertaking

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Abstract:

The proactive approach is a way how to improve planning during crisis situations. The implementation of the Business Continuity Management System can improve planning process in the transport branch during the crisis situation in the affected area. During the selection of the method for business continuity is important to take into account the fact that this method must cover all the aspects of activities, must be easy to understand to evaluators and last but not least this method must provide the required outputs for evaluation.

KEYWORDS: Continuity of Activity, railway transport, railway undertaking,

1. Introduction

The White Paper called *Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system* about future of transport till 2050 is the European Union law document. This document is addressed, among others, to the continuity of activities in case of disruption of transport. The European Commission found that old task is still actual and new task arise. All task is necessary to solved. The one of the tasks is Continuity of Activity in the railway transport branch.

2. Continuity of activity description in the railway transport branch

The Business Continuity Management System generally increases the resilience of each business against disruption or loss of key objectives. Continuity of Activities is important for task perform and for business strategies in every company. Railway transport has a specific position in the transport needs for the national interests. Transport services are necessary for basic functioning for state authority this function could be performed by railway transport.

[1]

Continuity is define like a process characterized by time, flow and unity. The synonyms could be the words like a chain, cohesion, connection, constancy, continuum, durability, endurance, interconnection, stability or survival. And the continuity of activities in the railway transport process perform ability of every involved individual element to strategic and tactic planning, adequately respond to emergencies, moreover maintain or resume own operations at the required time. Continuity of activities could be understood as vitality with definite ability. That ability means, for every involved individual element, permanently deliver products or services at a predefined acceptable level.

[2],[3]

The railway transport undertakings are parts of the continuity of activities in the railway transport system. Railway transport system is a system contains transport infrastructure, transport hubs, junctions and railway stations with technological equipment and transport means for carrying passengers or goods. The railway transport system subject could be represented by persons, means and founds with hierarchy of responsibilities, powers and relationships. Inclusion of means and founds into the concept is really important because concept is necessary for the continuity of activities.

The basic character of continuity of activity in the railway transport branch is vitality. Vitality has two identical attributes. The first attribute of vitality is strategic ability. Strategic ability is specific feature represent competitive advantage of the subject. The competitive advantage in the transport branch ensures competitiveness.

The competitive advantage is reflected positively in profitability. Strategic competence from the continuity point of view must result from the analysis outcomes of the neighbourhood and mainly from the results of the resources analysis. The strategic capacity of the subject can be determined as a consistency level of the strategic objectives with the mission and the strategy implementation success in comparison with the results with those objectives. The second basic attribute of vitality is strategic qualification. This attribute characterizes continuity of activities, too. While strategic capability is a top level management issue, tactical capability affects middle management. In the assessment process of the strategic qualification must be set quantitative targets precisely. There are monitored particular procedures and means leading to the realization of the strategy. After clarification of strategic and tactical ability, the definition of business continuity as a strategic and tactical capability of a subject can be presented. That capability connects, helps react on situation which can cause activities disruption and it can culminate to the crisis.

[4]

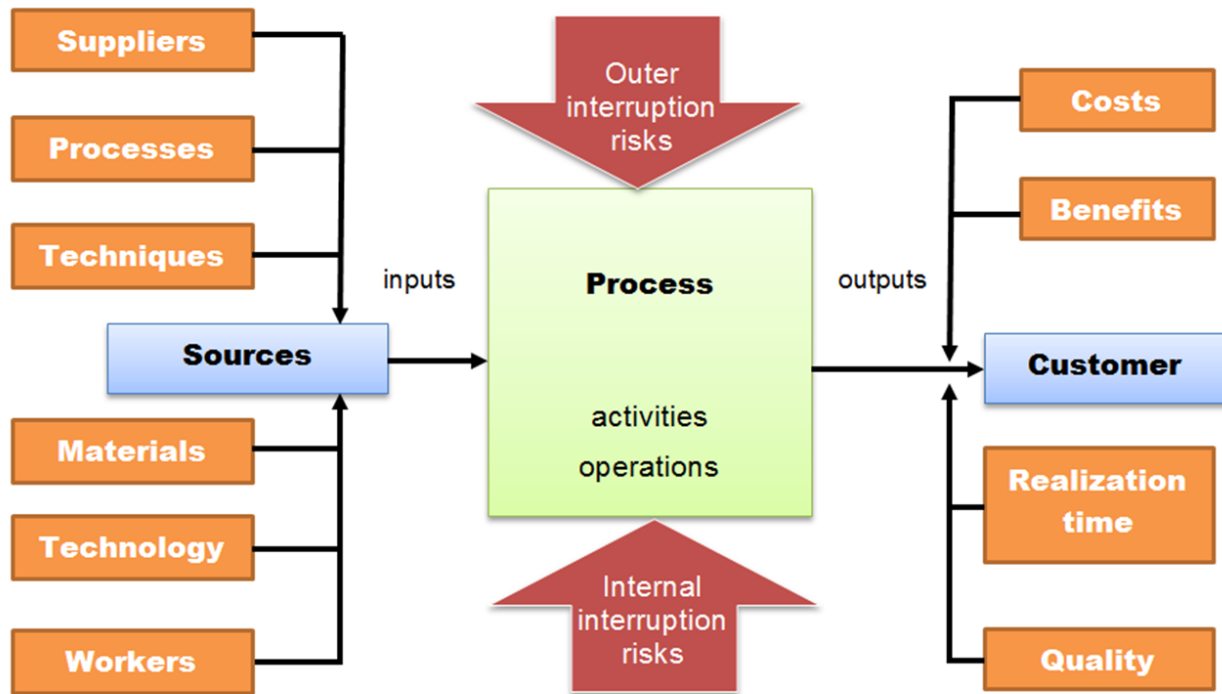
The railway companies offer service on the market. Demand for rail services is different than demand for material goods. Material goods demand is related with population living standards and population living style. Enterprises producing material goods have the opportunity to innovate their production program and stimulate demand. Thanks to the stimulating demand they can ensure sales, sales and profit growth. The innovation possibilities in the railway transport are limited. Railway companies, like other businesses entities in other sectors, are also profit-driven. It is essential for a railway company to know the requirements for a longer time horizon. Railway companies plan by the requirements performance, the necessary resource capacity, capital and, in terms of continuity, the resources needed to ensure continuity of activity on the railway environment. Every company is in the environment with economic cycle with turbulent conditions. The general goal is to achieve a steady state of the company, so-called homeostasis. The subject in the railway transport branch homeostasis is based on the interaction and adaptation. The subject reacts to changes in the external environment depends on two parameters. The first parameter is the power of change. The power of change it is given by the opportunity size or by the threat and the entity's ability to respond to change. A subject in the railway transport branch can plan and respond to incidents, solve problems with a possible activity interruption. All of that is realized by continuity of activity, which is actually a strategic and tactical ability to solve problems with a possible or already interrupted activity. The importance of the continuity of activity for subject in the functioning of the railway company will show after the event of transport failures or abnormalities. Irregularities consequences are losses not only for railway transport company but also for all transport users. On the other hand, production of a particular producer can usually be replaced by another production of the same kind of goods or by substitution, that option in the transport is limited. Alternative transport can provide transport at the demanded quality. But that alternative transport mode can provide services with higher costs and externalities.

[5], [6]

3. Process of continuity of activities in the railway transport

The smallest recognizable entity for activity in the continuity of activity is work bounded by the time frame. The activity could be manual (without software support) or automated. The set of interrelated or interacting activities that transform inputs into outputs is a process. Every activity is represented like a one logic step in the process. Process describes procedure in specific activities. The process is primarily characterized by the processing and represents a dynamic view of continuity. By the ISO 9001:2006 process is a set of interrelated or interacting activities that transform inputs into outputs. Company process is a complex of activities which changes the sum of inputs into the sum of outputs (goods or services) for other people or processes, using resources (people, technology, material, finance, tools, etc.). The continuity process is actually a flow of work moving from one activity to another and for greater processes it is flow of work from one department to another. Process has specific parameters that can be measurable, processes have owner, customer, clear boundaries, defined start, a certain number of steps in the process and defined end with output. The process is repeatable and can be defined on a variety of levels. Continuity processes must be included in all technological, manufacturing and economic activities of the railway transport entity. The management and optimization of continuity can be reduced to the economic consequences of business continuity violations. The figure shows the continuity process for the subject in the railway transport.

[3],[7],[8]



Figuration 1 Continuity of activity process for subject in railway transport
Source: Authors

The Continuity of Activity process represents coherent activities for subject in railway transport. The coherent activities needs more interconnected activities or requires more employees. Process inputs are sources. Sources are essential elements in the Continuity of Activity for the railway transport subject. The sources could be for example, raw materials, which also contain another materials, fuel, energy or buildings and spaces used for the processes in the railway transport system. Suppliers that provide processes with their products and services are sources, too. In addition, the source is a technique that hides vehicles, machines, mechanisms, but also hardware. Also very important source is workers and employees. Group of employees contains own employees (internal) and external employees (it is employees of suppliers). Last but not least sources are technologies, procedures and methods. Because the transport system is a continuum of transport means, routes, equipment and technology, therefore, the operator operating in the transport system must always calculate with the other processes of the railway organism.

[9],[10]

Processes can be classified into main processes and support processes. The main processes create value for the external customer. The result of the main process production is outputs that are required by an external client. The main processes are given by the core business activities that fulfill the subject's strategic image and mission. The main processes include the relocation process or the transport of goods in the freight transport or the transport of passengers in passenger transport or the process of ensuring the operability of a railway infrastructure, in the field of transport infrastructure manager. Management processes determine the strategic goals and ways to achieve them. Management processes contains all processes necessary for the achievement of the objectives. Supporting processes, well known like a auxiliary processes are necessary for creating conditions for the functioning of the main processes. Auxiliary processes ensures activities and sources for main processes or for the optionally provide their desired properties. The auxiliary processes can be quality control, research, development, distribution, business, financial, customs, insurance, service, information and advisory processes.

[7],[11],[12]

Specific core business continuity processes in the railway transport branch include activities to implement entity business continuity management, continuous management, and business continuity capability. Specification, end design, creation, implementation and initial testing can be included to initiate business continuity management. The very important role for the fully integratinf of continuity of activity have periodic testing of plans and their

updates, especially when there is a significant change in resources or organizational structure. Another important processes of business continuity for the railway company is identification of potential losses. Aim of the business continuity is to develop procedures and environments that will ensure continuity and renewal of the entity's core processes and activities to the rail at a predetermined minimum level. This process must be supported by the subject management. Business continuity protects the interests of stakeholders and other interest groups, protects a good reputation and business of the brand. In addition to huge accidents, business continuity process is intended to result with equally dangerous option. That dangerous option is loss of data availability or data integrity. The auxiliary processes support processes for overall business continuity support.

[8],[13]

4. Participant on the continuity

The continuity of activities in the railway transport can be seen from the perspective of individual railway companies or from the perspective of the user (customer) or another entity in the process. Individual views can be different in the assessment and in the results. In the point of customer view, the essentials activities in the continuity are activities necessary for their request. The basic value of request is determined by the user individually. The user considers decisive in terms of business continuity of activities, if his or her transport needs are fulfilled. Transport need arises as a consequence of the discrepancy between the existing location and the location where he or she wants to be. The relocation is then the result of the transport process. Transport process takes place in time and space. Transport process realization is important for the user. The key continuity activity from the perspective of the transport system user is the most reliable space and time relocation. From the national or regional authority point of view, the key continuity of activity task is the railway ensures the transport service of the definite area and the operation of the transport market is on the required extent level. For passenger transport is typical social fares subsidized from public sources, or by the freight transport profits as a contribution to efforts to maintain social peace. The continuity of activities includes ensuring the renewal and implementation of new transport infrastructure. New transport infrastructure is requires high financial costs from the state authority. That finance cannot be used for other activities. Transport infrastructure have a long construction period, and thus investments have long payback time. Moreover, for many of the investments currently being made in the railway transport branch is assumed that, it improving the transport quality, there will be no return on costs. On the other hand lot of externalities is reduced by the investments in the railway infrastructure. Moreover, the construction of railway networks is supported construction production, modernization supports the production of technology. From a railway transport perspective, business-specific continuity activities are key for its function and for perform railway company goals, or strategies. In principle, a transport company must provide a service, generate demand for it, and demand must be satisfied. The purpose of the transport company on the railway is to organize human activity in the area. The transport system to satisfy foreign needs so that the needs of the company are met, too. Any company can be successful in the long term if it does not respect the needs of the customer. A key activity of continuity in terms of transport company on the railway seems to be the fulfillment of the strategy. The strategy must be a long-term conception of the business activity and purpose of the strategy is to smartly and purposefully distribute all the entity's resources on the railway company so that two basic objectives can be fulfilled. The two basic objectives are reliability and accuracy of the railway transport.

[11], [13]

5. Conclusion

The continuity of activities is also about preventing how to prevent crisis and emergencies and establishing such system within the entity on the railway environment, which seeks to build greater resilience to ensure continuity of railway transport.

Correctly set up Business Continuity Management System for all railway entities using properly set resources and chosen strategy will enable rail transport to gain a competitive advantage.

References

- [1] **Soušek, R.; Rozová, D.; Němec, V.; Šustr, M.** *Business continuity management system in the transport.* In: 21st World Multi-Conference on Systemics, Cybernetics and Informatics (WMSCI 2017), Orlando, United States, 2017 p. 185-190. ISBN: 978-194176364-3
- [2] **Nedeliakova, E; Panak, M; Ponicky, J; Soušek, R.:** *Progressive Management Tools for Quality Improvement Application to transport market and railway transport.* In: International Conference on Engineering Science and Management (ESM): AER-Advances in Engineering Research. Zhengzhou, People's Republic of China, 2016, vol. 62, p. 195 – 198. ISBN:978-94-6252-218-3, ISSN: 2352-5401
- [3] **Dvořák, Z.; Leitner, B.; Milata, I.; Novák, L.; Soušek, R.:** *Theoretical background and software support for creation of railway transport model in crisis situations,* WMSCI 2010 - The 14th World Multi-Conference on Systemics, Cybernetics and Informatics, Proceedings. Orlando, Florida: International Institute of Informatics and Systemics, 2010, pp. 343-347.
- [4] **Dvořák, Z.; Raždík, J.; Soušek, R.; Sventeková, E.:** *Multi-agent System for Decreasing of Risk in Road Transport,* TRANSPORT MEANS 2010. Kaunas: Kauno technologijos universitetas, 2010, pp. 100-103.
- [5] **Fuchs, P.; Saska, T.; Soušek, R.; Vališ, D.:** *How to calculate the accident probability of dangerous substance transport.* Archives of Transport. 2012, vol. 24, no. 3, pp. 273-284.
- [6] **Fuchs, P.; Kamenický, J.; Ságl, P.; Zajíček J.:** *Hodnocení spolehlivosti jako běžná součást provozu českých jaderných elektráren,* 14th International Scientific Conference on Electric Power Engineering 2013, EPE 2013 2013, pp. 667-672.
- [7] **Kamenický, J.:** *Risk management based on choosing of signal from multiple measurements,* Reliability, Risk and Safety: Back to the Future 2010, pp. 2359-2363.
- [8] **Kamenický, J.:** *Options of effectiveness improvement of the RCM process,* 11th International Probabilistic Safety Assessment and Management Conference and the Annual European Safety and Reliability Conference 2012, PSAM11 ESREL 2012 2012, pp. 232-241.
- [9] **Říha, Z.; Němec, V.; Soušek, R.:** *Transportation and environment - Economic Research,* The 18th World Multi-Conference on Systemics, Cybernetics and Informatics, WMSCI 2014. Orlando, Florida: International Institute of Informatics and Systemics, 2014, vol. II, pp. 212-217.
- [10] **Soušek, R; Dvořák, Z.:** *Methods for Processing Type Threats in Railway Transport,* The 17th International Conference on Transport Means: Transport Means - Proceedings of the International Conference. Kaunas, Lithuania: Kaunas University of Technology, 2013 pp. 278 - 281.
- [11] **Šustr M.; Viskup P.; Fuchs P.:** *Monetary Costs of Transport Process Members, in the Railway Transport Caused by Irregularity,* The 20th International Scientific Conference Transport means 2016 : Transport Means - Proceedings of the International Conference. Juodkrante, Lithuania: Kaunas University of Technology, 2016, pp. 1058-1063
- [12] **Zadeh, L.A.,** *Outline of a New Approach to the Analysis of Complex Systems and Decision Processes.* IEEE Trans. Syst. Man. Cybern., 1, 1973, pp. 28-44.