Risk management as an element of processes continuity assurance

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Abstract

Dynamic growth of new technologies creates a formation of new kinds of risk in organizations’ activity. In this range one should notice the necessity of risk management. It should lead to risk minimization or elimination, and finally assure processes’ continuity. Risk management must have a system character, be connected with all realized processes and undergo the improvement as the effect of assessment, monitoring, measurement and analyses. The worked out coherent methodology of identification, analyses, assessment and acceptability evaluation determines the kind of risk undertaking. According to the proposed procedure it can be realized as operational control or system risk monitoring.

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1. Introduction

Every organization must realize its aims being exposed to influence of the factors of turbulent environment in which it functions. Regardless of the fact if the factors undergo the organization’s control or on the contrary they do not depend on the organization at all, the factors always decide about the effectiveness of the organization’s activities.

Definition of risk management, just like quality management, has been created as a result of political, economic, scientific and technological events of XX century and initially it was exclusively connected with the assurance of persons’ and property’s safety. Quickly changing external conditions of functioning of organizations has influenced

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on the extension of the possibility of risk management. Nowadays both continuous increase of risk range and changes in the structure between particular kinds of risk take place. However the system risk management assumes the character of business continuity management. It means planning, implementation and monitoring the activities having on aim the assurance of continuity of the realized by the organization processes in the moment of occurrence of real and potential disruptions and in the consequence - assessment and improvement of those activities. Business continuity management process should be repeatable, permanently recorded in the organizational structure and realized accordingly to the accepted procedures. It also assumes, similarly like quality, environmental and occupational safety management, system character. Model of business continuity management, based on the ISO 22301 standard, “specifies requirements to plan, establish, implement, operate, monitor, review, maintain and continually improve a documented management system to protect against, reduce likelihood of occurrence, prepare for, respond to, and recover from disruptive incidents when they arise”.

The risk, which undergo this system management aiming at the assurance of processes’ continuity, is usually classified as: market risk, credit risk, legal risk and operational risk as well as business risk. In a simplified form market, credit and legal risk can be defined as the one, which accompanies the activities of organization in the turbulent direct and indirect surroundings. The operational risk, resulting from improper management, unreliability of workers and technical systems, can be treated as a result of functioning of the subsystems creating the organization.

Operational processes determine directly the ability of every organization to fulfill the integrated quality, environmental and occupational safety requirements.

However it is worth considering that everyday activity of an organization is connected only with some probability of occurrence of threats’ effects in the operational aims achievement. Therefore the best way to take up the operational risk is systemic management which should be directed towards the prevention of the effects of quality, environmental and occupational safety threats.

As a manner of the reaction to the operational risk created by the critical threats with small occurrence probability the assurance of processes continuity one can interpret. The assurance of the processes continuity should be based on the realization of breakdown activities until the state before the breakdown. On the operation level it can be conducted in the systematic way, so - in the reaction on the effects of the critical threats - by the use of proper organizational structure as well as procedures oriented to the realization of the fundamental operational processes in the situation of the risk materialization.

2. Methodology

Regardless of the importance of threats and probability of their occurrence and definition of the manner of risk taking, the basic element of risk management is always risk assessment. The identified threats are the subject to analyses, estimation of risk level as well as to assessment of risk acceptability. Estimation of risk level usually consist of probability and importance of threats and their effects. Organization should determine on its own which level of operational risk is acceptable for organization and which can’t be treated as the acceptable one.

Taking the foregoing into account in the study one has proposed the method of operational risk assessment. The effectiveness of the method has been confirmed by the analysis results of the analysis which had been carried out in several organizations on the basis of the author methodology.

For the purposes of the worked out methodology operational risk has been defined as any risk accompanying a production process and being a result of the manner of the system and technical preparation of the organization for the internal and external factors disturbing regular processes realization. It is connected with threats in the quality, environmental and occupational safety sphere, both repeated and those, which have never occurred. Operational risk management can be described as the proceedings connected with the risk adequate to its quantity or quality. Therefore risk management should first of all include the identification of the risk range and risk assessment and then undertaking the activities allowing for risk minimization.

In case of operational risk its range should be attributed, according to the “process approach”, depending on its source reason, to the: system, man, manner of processes realization, technical equipment as well as measurement and control. It’s worth attributing the risk to quality, environmental and occupational safety range. The identified
threats are the subject to analyses, estimation of the risk level as well as assessment of its acceptability. Estimation of the risk level is based on the determination of the probability of occurrence of the identified threats’ effects and the description of their significance. Organization defines itself the acceptable level of the risk and on this basis it makes a choice of effective method of active or passive risk undertaking. Active approach to risk undertaking is constituted by: risk avoidance, risk transfer or risk financing. Risk, which hasn’t been eliminated in the active way, is the subject of monitoring.

Risk assessment, independently of its range, includes both the identification of the potential risk equated to technological, production and system processes and the selection of indicators allowing for its valuation in the objective and effective way. One should search for quantity methods which application enables the reliable assessment of risk and supervision of processes. Unfortunately risk in the management system based on the quality, environmental and occupational safety criterion usually has subjective character. Therefore in its estimation one should apply both quantitative and qualitative methods. It is important to assign the identified risk to the specific level and description of risk character. It’s not an easy task. Processes of the technological level are always operational processes and all operational processes are also system processes. The relation doesn’t work in a right way “in the reverse”. And as it can be stated - not every risk realizing on the system level is also operational risk.

Definitely in the range of operational risk on the technological level it is important to use quantitative methods of risk assessment and subsequently supervise the process in the active way by the operational control. In case of operational risk of system risk character it is advisable to monitor and audit the risk (see Fig. 1).

![Diagram](image)

Fig. 1. Scheme of classification of risk management methods and manners of risk undertaking dependently on the identified risk level.

Univocal identification of risk is the grounds of making decision about the manner of risk management. From the point of view of achievement of risk management aims the most important seems to be systematic minimization of risk assuming the form of integrated operational control as well as monitoring of integrated system risk. Algorithm of integrated risk assessment, realized as an element of integrated operational control, includes: description of incompatibilities, probability of their causes and significance of their effects, the real risk assessment using the Integrated Risk Ratio and definition of the key incompatibilities creating the main risk value. System risk, excluding operational risk, has in most cases un-quantified character. In practice it’s difficult to evaluate it by direct measurement. It is possible to make the system assessment of the risk and manage it by the system monitoring. The range of system monitoring depends on the risk ranges defined in the system by the organization. Every defined category is described by the range importance reflecting the significance of the realized processes for the minimization of the system risk.

3. Results and discussion

Conditions of the supervised both operational and system risk was assured in four organizations realizing different kind of production processes. The worked out methodology based on the integrated risk assessment and operational control as well as integrated audit and system monitoring was verified for three years.
On the operational level the usage of the integrated risk estimation based on the Integrated Risk Ratio values allowed for pointing out the processes characterized by very high unacceptable risk. In this case the application of the solutions enabling the supervised sustain of the risk on the determined level by the operational control proved to be insufficient. The effect of the used methodology was undertaking the activities directed towards the avoidance of the risk ensuring not only the reduction of the probability of threats’ effects occurrence, but first of all - prevention of the cause of incompatibility by the elimination of a threat, which the incompatibility creates.

As a processes characterized by the lowest values of the Integrated Risk Ratio (IRR) processes realized in organization A (IRR\textsubscript{A}) and D (IRR\textsubscript{D}) were indicated. Risk of the process realized in the organization B calculated as IRR\textsubscript{B} was defined as high. Risk of the processes of organization C was described by especially high values of the Integrated Risk Ratio (IRR\textsubscript{C}). According to the assumed ALARP (as low as reasonably practicable) rule, specifying ranges of risk acceptability, organizations had carried out the estimation of the risk acceptance (see Fig. 2).

- **risk acceptability**
  - acceptable
  - acceptable if the defined conditions are fulfilled
  - unacceptable

**Integrated Risk Ratio**

| IRR\textsubscript{A} | 254 |
|----------------------|-----|
| IRR\textsubscript{D} | 179 |
| WZR\textsubscript{B} | 438 |
| WZR\textsubscript{C} | 686 |

**condition:**
- special character of the realized process
- operational control

Fig. 2. Scheme of acceptability assessment of risk for the processes realized in the analyzed organizations.

On the basis of the proposed rules risk of the process realized in organizations C was described as unacceptable. Organization B found the risk as acceptable despite high value of the IRR. However the realized process is used as a special without the possibility of verification so the risk level is acceptable under the condition of operational control. In organizations A and D risk was characterized as acceptable.

In the range of the system processes in all of the analyzed organizations implementation of the proposed risk system was processing in the similar way, which was confirmed by the usage of the worked out methodology of system monitoring (see Table 1).
Table 1. Specification of the results of the system monitoring realized in organizations A, B, C and D in years 2009-2012 as well as the minimal values of processes' efficiency on improvement levels of the proposed system monitoring.

| Range of the integrated risk | Degree of requirements’ fulfillment (%) |
|-----------------------------|------------------------------------------|
|                             | year 2009 | year 2010 | year 2011 | year 2012 | level 0 | level 1 |
| operational control         |           |           |           |           |        |
| organization A              | 75        | 79        | 81        | 89        |        |
| organization B              | 68        | 78        | 84        | 85        | 70      | 75      |
| organization C              | 72        | 73        | 78        | 82        |        |
| organization D              | 81        | 89        | 90        | 92        |        |

System monitoring in every range of the risk management confirmed the first stage of system implementation. The efficiency improvement of the realized system processes in the time of two years from the moment of the implementation reflects the acceptance and necessity of improvement in the risk system.

4. Conclusions

In the organizational practice there are no objective methods of uniform assessment of every kind of risk which can arise in the organization. Therefore the originality of the paper belongs to the worked out methodology.

It is important to define all types of risk, classify it, use the proper risk assessment methods in the systematic way and manage the risk in the system. The fundamental phase of risk management is always risk assessment usually taking into account the probability and importance of threats and their effects. It is worth mentioning that the most reliable assessment methods are definitely quantitative methods. Unfortunately not every kind of risk occurring in the nowadays organization can be measured with the usage of this type of methods.

The key importance in every kind of organization, which wants to manage the risk, should be attributed to classification of operational and system risk. In the range of operational risk mostly on the technological level it is important to use quantitative methods of risk assessment and realize processes in the supervised conditions based on the operational control. In case of system one should apply methods of auditing and monitoring the risk. The proposed manner of risk assessment seems to be the point out to risk management and assuring the continuity of the realized processes.

The practical implication of the proposed methodology in several organizations has confirmed its effectiveness independently on quality and quantity of the identified risk.

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