APPROACH TO RISK MANAGEMENT SYSTEMATIC BASIS

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SUMMARY:

Risk management as part of the crisis management is aimed at addressing risks. Recently it has become dominant area of interest for both theoreticians and practitioners of all types in this field. Risk and risk management are rather new concepts in Serbia both in theoretical and practical sense. Different theoreticians and generally, speaking, people addressing risks have different approaches to defining risk and the stages of risk management. As risk management is process, indispensable at all stages of one system functioning, it is necessary to consider possibility of developing and applying systemic approach to risks management. That is why it is necessary to develop one systemic approach that would be used in risk management. One such systemic approach to risk management is presented in this paper as an attempt to manage suspense and threats.

INTRODUCTION

Management is the phenomenon of the 20th century and it will have its important role in the 21st century as well. From the moment it appeared till today there have been many schools and directions within the theory of management. It appeared suddenly with great consequences changing all spheres of the society. There are different types of management definitions which basically produce its essential meaning. It can be said that it represents certain functions related to the governing and executive function. Governing function of the management results from the ownership relations while executive function is part of management and is attributed to the so called "not-owners".

From the above mentioned one can see that management is a very complex and interdisciplinary operation for it is related to the process and activities as well as to the performers and executors of the managing functions in organizations.

Theory and practical application of risk management originated in the USA during fifties of the past century. In those days risk management was based on financial protection by means of insurance. In time more and more attention was paid to prevention measures. An opinion prevailed that the agents should be professionally reoriented and become risk managers. Soon risk managers were entrusted responsibility for establishing and addressing entire risk management in their companies.

Essentially, the task of the modern management is managing the changes in contrast to traditional regulatory and control role i.e. maintaining the system in stable conditions. Having in mind that contemporary changes are often, dynamic, comprehensive and with uncertain outcome then an increased need is imposed to manage such uncertainties which contain certain risks. Very conception of the risk can be understood as certain probability or possibility of realization of unwanted consequences of some event.

In many cases approach to risk management is based on the experience, following industrial trend or "good feeling" of a particular manager. Many managers justify such approach and define it as successful. Decision about a particular strategic investment cannot be based only on "good feeling" but must have defined value that is constantly evaluated to be successful in any moment[2].

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All risks have direct and indirect influence on safe management with all important processes of the organization. All large organizations have defined manager teams that manage risk in the projects, company investments, infrastructure, health and social policy, personnel management, environment, etc. The risk always exists; it is changeable, dynamic and makes risk management a single process.

ORGANIZATIONAL STRUCTURE FOR RISK MANAGEMENT

Organizational structure of risk management can be centralized and decentralized structure (Figure 1). The context of risk in this study is a case when the state of nature is unknown but there is objective or empiric evidence on it which enables the decision maker to attribute relevant probability of occurrence to the diverse states of nature. Risk management team leader as project manager or risk manager chooses appropriate structure depending upon type of organization [4, 11].

With centralized organization the team leader forms the team, which he manages and which is responsible for all aspects of further risk management. This concept reduces individual responsibility for risk for this responsibility lies with the team. The best thing is to use this concept in the initial phase of risk assessment i.e. in preparation for risk management. The activities in this stage comprise definition of the working framework, collecting information on the subject of analysis, processing of data and possible extension of team's plans. On the other hand, centralization of risk management leads to the wrong and incomplete assessments, confusion and resources wasting.

With decentralized concept degree of decentralization depends upon the distribution of responsibilities for risk management. In case of such structure we have teams for risk assessment, each in its field (the team core consists most often of the following sectors representatives: marketing, production, technology, procurement, quality control and sales. If necessary other people may participate as well: from logistics, post sale, legal affairs, etc) who are in charge of making risk assessment and who are responsible for risk. Within these teams there is a need to have the team leader who is at the same time member of the main risk management team [5,6]. In the risk management process it is necessary to include external contractors and associates who make assessment of their own risk and include it in the entire risk assessment. It is also necessary to include the employees who will take part in implementation of action plan. Coordinator of the risk management assists the team leader in the managing process for better implementation and in order to avoid problems [7].

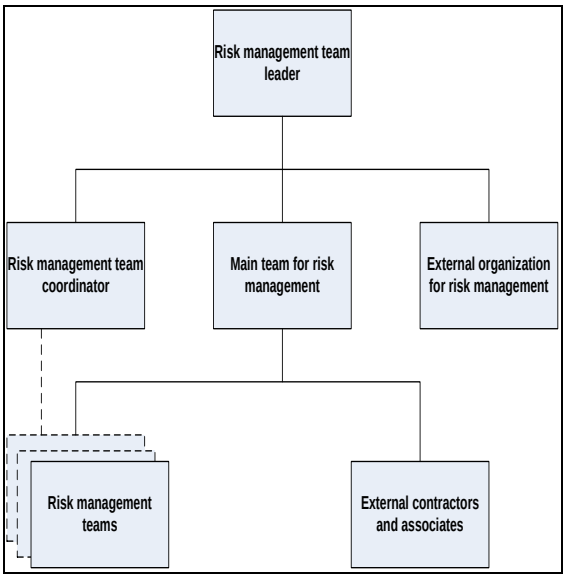

Fig. 1 **Structure of risk management organization in principle**

The coordinators are experienced and trained managers; essentially they are "liaison officers" of the given organization with the external cooperators, employees and top managers. The coordinator should perform this duty apart from his basic job which shows that risk management is an integral part of the entire management. Generally, management coordinator is at the same time risk management team leader [3, 7]. His basic role as coordinator understands organization of meetings, securing support of the executives, providing working conditions, informing team members about the executives' requests, monitoring the results, terms and team progress and reporting to the executives.

Main team for risk assessment consists of the representatives of all teams for risk assessments and external contractors and associates in order to secure integration and implementation of all decisions in the form suitable for the decision making process but also understandable to the final executors[8]. This kind of decision making prevents individual decision making within the risk assessment teams.

That is why the risk analysis is always connected to unwanted results and consequences [4]. Decision maker must study what will be the result and how it will be related to others in order to see possibilities of defining probability of its occurrence. Then it is possible to evaluate projects i.e. alternatives in making decisions and chose the best action. Risk analysis enables decision maker to have logical framework to select the best action.

Risk management team leader may engage independent organization for risk assessment in cases of special assessments and requests (hardware, software specific area, etc) when the system does not have experts for that field or when independent assessment is needed. The participation of the external organizations is limited [9, 13]. The limitations are defined by the top management in the form of a contract and following the suggestions of the risk assessment team.

RISK MANAGEMENT SYSTEMIC APPROACH

Lately, risk management attracts even more attention. This is simply necessary due to the focus on organizations to survive, that is, improve their position within the total globalization and survival. Every decision, personal, business or any other contains certain risks. Risk management is directly connected to crisis management. The risk management concept is based on the fundamental assumption that it is a planned, far-sighted, structurized, informative and ever appliable technique. The key to a successful risk management is early stage planning and overall implementation which is based on the processes given in figure 2.
Risks management contemporary concept, as shown in figure 2, is based on assessment of risk as a continuous process, inclusion of a large number of people in risk management, since inefficient processes signify the source of risk, the management claims responsibilities for risk assessment and management, meaning that they define the risk formal policy, the true sources of risk are continually monitored and evaluated and this being in advance,and preventive; directed management reduces unacceptable risks to acceptable or avoids them.

Risks management contents represent their classification and evaluation, which, together with the damage amount evalution and performing possibility enables preventive crisis management as well.

The risk analysis has been quite neglected, but today it is gaining a very important role. If observed, the system of organizational rules and standards relating to risk identifying and relation towards risks and undertaken activities is called *risk management*.
The risk management system can be defined as an overall measurement and control process of relevant and potential risks and potential loss analysis. In the particular case, risk represents danger to individuals, objects and interests which can emerge as damage, threatening assets or specific interests of the organization, military-organizational system included.

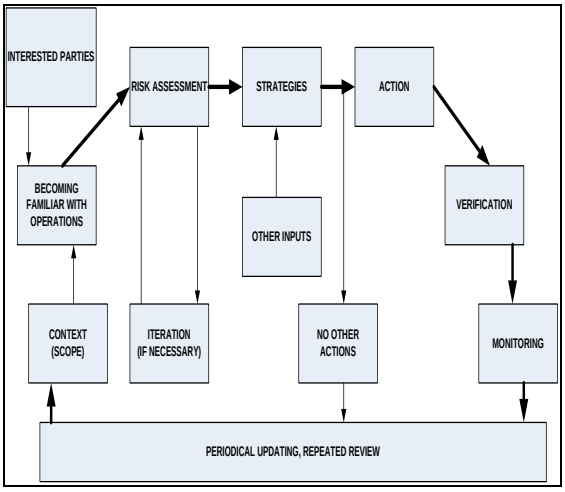

Fig. 2. **Phases of risk management**

Today, all up to date researches within the risk management lead to accepting the presented processes and they are constantly proven through practice [2,12]. Although each risk management strategy depends on the nature of the considered system, presented processes are continual and logically connected so that they represent the entirety of the risk management systematic approach process and comprise: risk planning, risk analysis (identification and risk assessment), undertaking measures to lessen the risk and risks supervision. .

RISK PLANNING

The management process starts with planning which can be defined as a process of setting future goals, assuming about the environment the defined goals are to be realized in, chosing of the action direction, means and ways of achieving goals.

Risk planning is the first phase of risk management and represents a group of activities which are being performed within the entire risk

management process and are defined by the risk management plan. It consists of defining the context of the problem, the project size and getting acquainted with the operations [5,16]. All interested parties should be included in risk planning.

RISK ANALYSIS

Risk analysis comprises elements manifested in cognition and assessment for organization goals and activities. Risks identification and their assessment dominate the entire process. It is generally accepted that risks be sorted into material and non-material categories.Material risks refer to loss danger, while non-material show implications to uncertainty in case of a situation such as where there will be losses or gains.
By taking measures to lessen the risk the risks in question are mastered or reduced [15]. Risks supervision is a continual activity because the risks change during the time, they appear and disappear, even their frequency is changeable.
Risk analysis consists of the risk identification process and risk assessment.

Chart. 1

Preliminary risk matrix

Risk sources	Essential resources	
	Financial	Human
State and local laws and regulations	Changes of laws and regulations may affect income and business policy	Special accommodation to the laws relative to human rights, rights of the people
Contracts and legal relations	Parties to the contract may try to transfer risk to public institutions	Employees' trade organizations may try to control employment conditions...
Natural hazards	The storm may reduce income of the damaged areas of business	The storm may prevent employees to come to work

Risk identification represents a process of elements survey and system process in order to identify and document the potential risks. The aim is to perceive on time the tendencies which jeoperdise the organization's functioning. Special attention is then paid to hazardous businesses, unregularities, law breaches etc. Risks may occur in various fields, such as legal, political and other working conditions of the organization, including natural influences as well. Risk identification is a structural, detailed and complete coverage of all the relevant risks, including dangers and damages and possible activity losses as well as their mutual impact. Representing information base for further steps, and risks are primarily analysed according to the following criteria:

1. monitoring level (business processes, business fields, etc.),
2. monitoring fields (services, research and development and the like) and
3. type of risk (external, internal, operative and the like)

Processes that support risk identification and other processes which act together within various business entities can be the object of risk identification. The result of the process of risk identification is the organization profile risk, the current risk image which keeps changing due to constant changes of external and internal surroundings.

The process of risk identification is facilitated by various procedures. One of the procedures is the preliminary risk matrix, (chart 1).

Criteria and relevant variables are based on probability measuring of unwanted event occurrence, which exists in every project. The project evaluation is done on basis of this probability.

Risk analysis primarily deals with the uncertainty which exists in the problem in question [3,14]. It provides logical quantitative procedure in estimating the uncertainty and evaluation of the project

This procedure gives an effective tool for incorporating subjective beliefs, information and evaluations in estimating the uncertainty. The basic elements for risk analysis bringing to effect are described in figure 3.

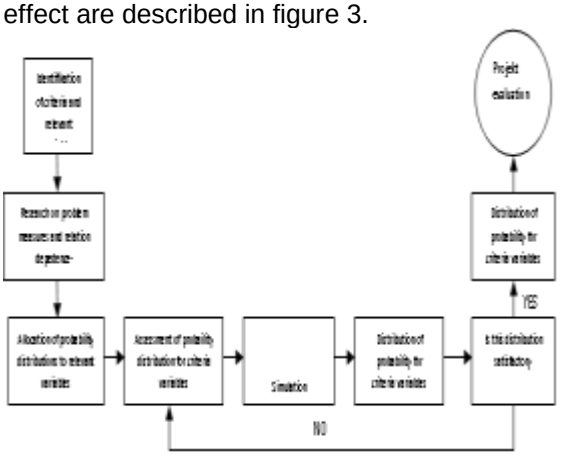

Fig. 3 **Risk analysis approach**

Risk evaluation is a step in the process of risk management where the emphasis is on the estimation of the amount of damage and the probability of key risks occurring. [9]. While estimating the probability of risks occurring and the amount of damage, a quantitative estimation is given. *Quantitative* risk estimation understands numerically formed risk estimation. It is calculated by the formula:

Risk = P x C x c.....(1)

P - probability of risk occurrance
C - consequence caused by risk occurrence
c - corrective coefficient

Combining probability and the strength of consequences, risk evaluation is presented in risk matrix, where, the risks are sorted according to the amount of damage and probability of occurrence, as the result, the level or amount of risk is achieved. The corrective coefficient relates to some of the risk factors potential deviations in relation to the values set by the risk criterion. It depends substantially of protected values vulnerability or exposal to threats.

Areas of specially important risk categories relevant in reporting are shaded within the matrix, while the risks of high probability which are under constant control, are marked distinctly [9,10]. The reports about the risks of some management levels are done according to the graduated threshold values. The threshold value understands the volume upon which a risk is the relevant value for the entity in question. The essential question in this matrix refers to as to which risk threshold value the certain management level should be informed. Each particular area defines threshold value for particular reporting levels of and is responsible for it.

Deciding upon the level of risk should be done within the matrix, (chart 2), for example: *Unacceptable* (51 to 100), *Acceptable* (11 to 50), *Marginal* (1 to 10). Depending on the risk value, priority in action can be determined. For example: unacceptable risks are of first grade priority, acceptable of second grade, marginal the third, etc.

Risks with a value under 10 can be considered irrelevant, but should be registered and in the following risk evaluation must be taken into account. In the new risk considering new value levels for the amount of consequences and probability may be formed and these risks may be of significance.

Chart. 2

Risk level matrix

Probability	Seriousness of consequences		
	Small (1)	Medium (5)	High (10)
High (10)	Marginal (10)	Acceptable (50)	Unacceptable (100)
Medium (5)	Marginal (5)	Acceptable (25)	Acceptable (50)
Small (1)	Marginal (1)	Marginal (5)	Marginal (10)

Evaluation of risk is a process of quantified risk comparison to established criteria in order to define risk usability. Usability criteria can be viewed from various angles for example: expenses and benefits, legal regulations, economic aspects, according to the enviornment protection, contractor's requests, defined priorities, probability to occur, risk consequences etc. The way out of this process is a list of risk priorities.

The use of risk analysis provides efficient communication between all the parties in cooperation in the process of estimating probability distribution. *It is important to stress that identification of relevant organizational-specific risk elements is one of the most important pre-conditions for a successful risk analysis and is directly related to specific questions of the organization.*

UNDERTAKING MEASURES TO LESSEN THE RISK

Measures to lessen the risk understand active influence on risks previously identified in the sense of reducing the probability of a risk occurrence and separating the possible damage that could occur. Depending on the probability of risk occurrence and possible damage, the management determines minimal values (thresholds) which if exceeded present a potential loss for the organization.

Undertaking measures to lessen the risk is the process of chosing the best strategy for risk management in accordance with the existing limitations and set goals. A plan of choice strategies is formed in this phase. The strategy for risk management implies risk control, risk reducement, risk retaining and shifting or transfer of risk.

By *risk control,* mode for its control is being found, in other words, its probability and consequences on the system [17]. The modes for risk control are: the use of alternative design which provides risk reduction, development of a parallel system which serves for risk research,

aggregate build principle for easier change of parts, use of models, simulations, etc.

Risk reduction is such a management strategy where certain changes in the system are made, changes in concept, requests, specifications and performances (maximum speed reduction, working temperature reduction, introducing new technologies, protection measures application...) for possibility reduction of risky event occurrence and its influence on the system and environment.

Risk retaining means risk accepting if it appears in the system and a strategy is desirable in case of small risks appearance. Naturally, risk retain is not desirable in cases of big risks appearance, that is, it is acceptable only if the probability of big risks appearance situation is small [17,19].

Shifting or transfer of risk is such a strategy where the tendency is to liberate from or reduce the risk in such a manner that part of the risk or entire risk be shifted to another part of the system or another side. It is an extreme measure of mastering the risks, and understands a total elimination of risks, meaning the elimination of the probability of occurrence and the probable damage comes down to zero. This strategy is favourable only in situations when there is no other acceptable alternative.

Every organization, under adequate measures, can bear the risks of medium probability of occurrence, and risks of medium to low possible damage. The stated measures have a preventive character. The choice of measures for overcoming a risk situation is under the jurisdiction of the managers of the management and depends on the specific features of the organization.

COMMUNICATION AND INFORMING THROUGH THE PROCESS OF MANAGEMENT

Communication leads to information about the team analysis participants, priorities and main goals, certain phases exits, that is, their risks data basis or the process of carrying out the analysis. In this way the directing of management's process to priority goals and two-way course of communication is achieved [9,18]. Risk documenting is an obligatory procedure within each risk management phase and consists of all plans, assessments and reports. That is the last step in the risk management process and includes:

- submitting accounts and evidence (when the crisis occurs the managers can prove their responsible behaviour)
- the role of safety (a document on holding to the measure system risks management safety in a longer period of time is needed).
- the role of checking (risk management system is checked by various controls and administration, as a precondition, and risk management system documents are basis and precondition for such a checking .

All measures of the risk management system must be documented. For this purpose,writing a manual and plans for risks management with defined goals, guidelines and procedures is recommended.

Risk management is a permanent and continuous process and there is always a need for short, special reports, briefings and assessments and in such cases these reports should always be saved in the risk management information system. That system represents the data basis about the current and historic data about the risk and is used as a basis for forming reports, fig.4.

Document forms depend on the size and nature of the system in question, and some of the useful documents in the risk management process are: risk management plan, risk assessment report (serves as a basic document in decision making), risks list as per priorities, strategy plan for response to risks and risk control report (regular and special reports).

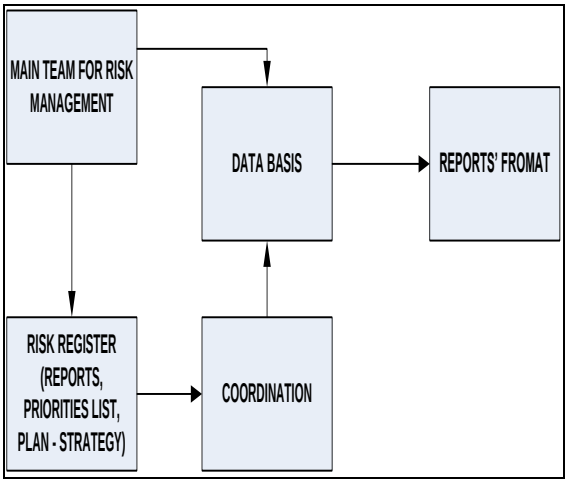

Fig. 4 **Data basis creating and risk report description**

SUMMARY

Risk management is a process of active decisions making by which problems are avoided before they occur. Decisions making process is performed in certain risky and uncertain situations, which is basically a challenge for the leaders of the management. Risk management directly improves the decision making process, especially in cases of high risks, enabling the managers to understand the environment (closer and wider) and the risks, protect themselves and the organization and so achieve the set goals. Risk analysis is very successfully solved by certain software solutions, that is, systems for decision support. Analytica is presented in the paper as a tool for decision support while risk analysing and its application possibility only indicated.

This article, in that context, tries to answer to possible management of the certain risk and an approach on systemic basis, by which total contribution is given to risks management as an important activity.

Predicting events which might get spontaneous becomes an everyday activity and risk management becomes a process equal to other processes in the project, production etc. On the other hand, risk management should provide a continual existing of system [17, 18]. Documents deriving from the risk management process enable the risk management accreditation process and authorization process.

Common for risk management is expressed through a defined tool in the decision process which integrates constant evaluation of what might go wrong (risks), determining which risks are the most significant and the contents and strategy to fight these risks [19]. As previously mentioned, especially in the analysis aspect and risks management, the most significant risk management elements can be defined and subsumed under: *identification, analysis, plan, research, control and communication.* All these elements are integrated into one entity and represent a logical order in the risk management process.

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