Risk Management Through Systematization: Risk Management Culture

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Abstract: *Risks always accompany any possible type of activity, it is a complex economic concept, without an effective management system which it is impossible to imagine the functioning of a modern enterprise.*

Close attention has always been paid to the creation and improvement of the risk management system, while the very nature of this economic category predetermines multiple and diverse approaches, both to the assessment methodology and to the management methodology.

Systematization of numerous and diverse risks is the basis for creating an effective system for their further identification, analysis and description, in order to increase the effectiveness of risk management. The issues addressed in this article allow you to take a fresh look at the construction and use of the risk management system.

Keywords: *Risk, Risk Management, Risk Management Culture.*

I. INTRODUCTION

The concept of risk in modern economic science does not have a single basic definition, often the very essence of such a category as risk is interpreted differently, it may be a chance of the probability of not getting the desired result, or the very fact of a probable event as a result of which negative consequences can occur. In a narrower sense, risk is usually understood as one form or another of loss of cash associated with losses in the form of additional expenses or income below the planned level.

It goes without saying that risk is an essential feature of entrepreneurial activity. In other words, entrepreneurship is directly associated with the probability of certain threats, which is quite natural for this type of activity.

Risk management is a key element of the strategic activities of any organization; globally, this system is used at all levels of economic activity and for maximum effectiveness should have a comprehensive systematic approach to both assessing the level of risk and choosing a controlling influence. In general, approaches to risk management involve four options for managing them:

- method of abandoning excessively risky activities,
- method of reducing the degree of risk, or its diversification,
- method of risk delegation, by outsourcing or insurance;
- method of taking risk and creating reserves or reserves to compensate for possible losses.

Naturally, the effectiveness of the selected impact directly depends on a qualitative assessment and risk identification. In the modern political and economic environment, the quantity and quality of risks is diverse, and this diversity is growing and deepening.

One of the options for a risk management system, or risk management, is schematically presented in Fig.1.

The basic element of this system can determine the risk assessment stage, this stage is a comprehensive basis for launching the subsequent iteration of the entire risk management cycle. Naturally, in the absence of the ability to identify and identify the risk, it is impossible to carry out all further work to manage it.

Identification and risk analysis being the basis for the management system, however, in essence, they are not the stages that can be considered the foundation of the system, which we will call the basis of the risk management culture. Systematization of risks in order to further manage them is what determines the basis of a risk management culture.

The diverse nature of risks is predetermined by the nature of this phenomenon, and of course for each business entity, this diversity will be formed on the basis of external and internal environmental factors in which it operates.

Before moving on to the issue of systematization, we should dwell on the issue of risk classification. As already noted, risks can be divided into external and internal, but such a division is too general for such a complex economic category.

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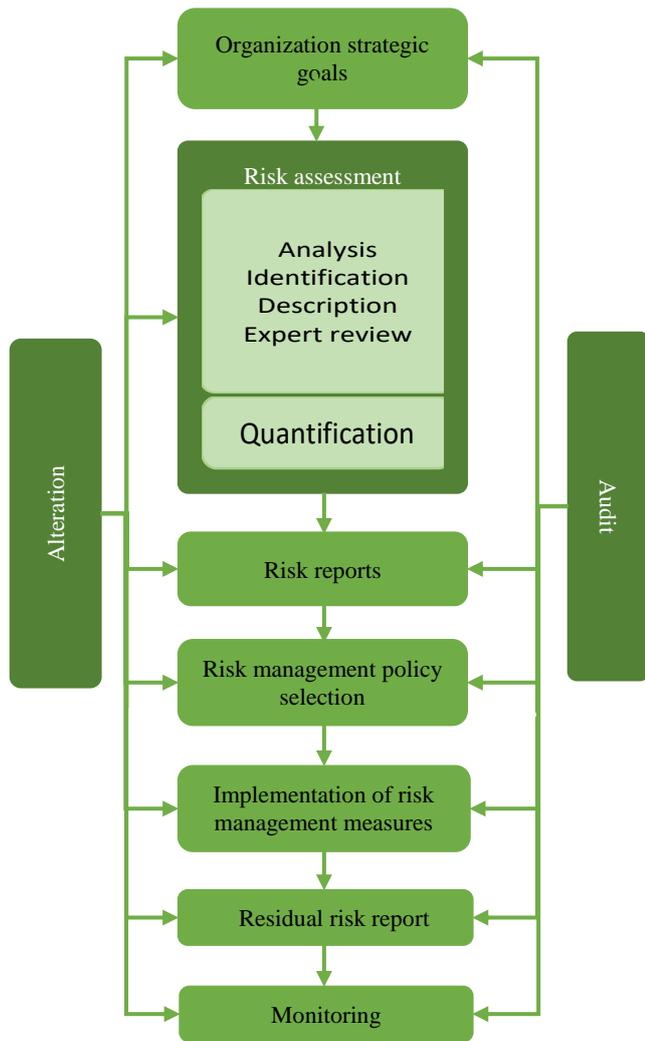
Fig. 1. Risk management processes.

It is possible to classify risks by the sphere of their occurrence, for example, distinguish production risks, commercial, financial or insurance, this classification determines the general groups of risks that arise in a certain field of activity of the organization:

- production risks - associated with the failure to fulfill plans or indicators for the production of goods or servants, inadequate use of production capacities, which will lead to excessive or, conversely, insufficient depreciation, etc.
- commercial risks - risks arising in the sphere of sales of goods and services; they can be caused by changes in prices for goods, both sold and purchased, increase in distribution costs, changes in market conditions, etc.
- financial risks - the sphere of their occurrence, these are financial obligations of the organization or vice versa financial obligations to the organization of its counterparties.
- insurance risks - as the name of the sector implies, these are risks arising from the occurrence of insurance events, they can be caused by an ineffective insurance policy of the company.

Another acceptable option for classifying risks may be classification by the nature of the consequences, here we should single out the so-called net risks - which most often entail losses for entrepreneurial activity, and commercial risks - which can both incur losses and bring additional profit, for example, in the result of currency fluctuations.

We will group the main categories of risks associated with the activities of almost any commercial enterprise in a convenient scheme for perception (fig.2).

With such a broad approach, even to the very issue of risk classification, managing individual risks or even groups becomes very difficult, it is in this case that an integrated approach to risk management is needed by systematizing them.
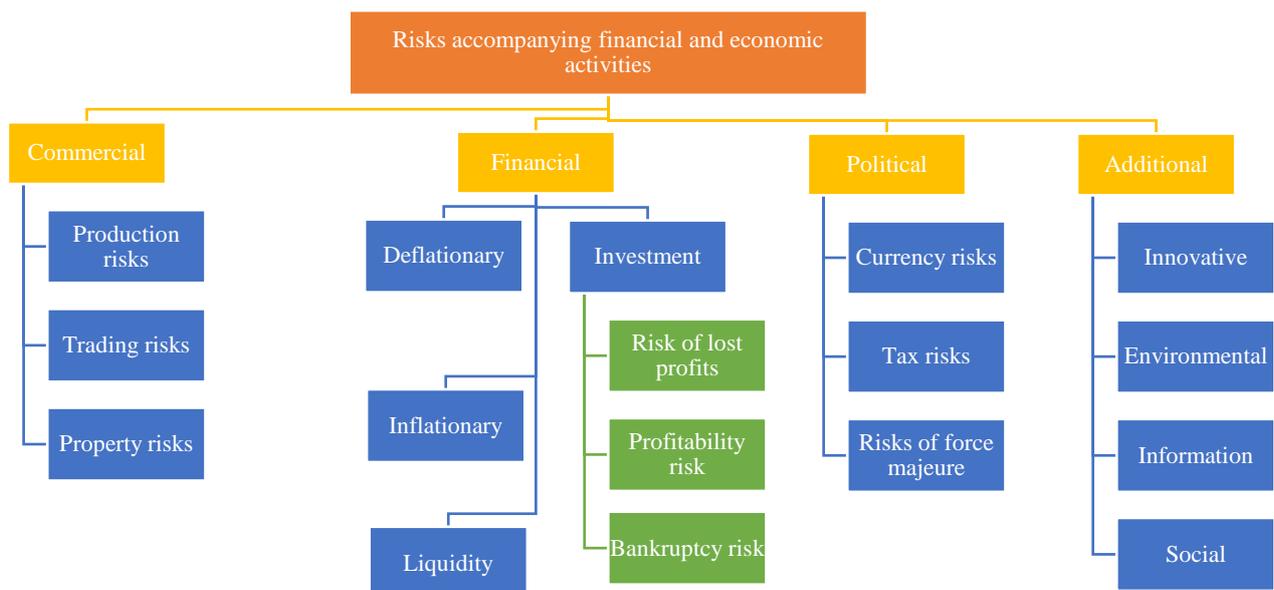

Fig. 2.Classification of types of risks.

That is why, along with new methods of risk management, we must not forget about the development of the culture of managing them, because despite the fact that the opinions of an expert expert in risk management are undoubtedly important, an ordinary employee may know what is easy for an experienced specialist to miss, simply because difficulties in perceiving such a complex concept.

We would also like to note that the risk management scheme itself should not be rigidly tied to the functionality of any one unit. There is no doubt that the company needs specialized risk management, but it is also necessary to develop awareness of the importance of risk management and the management culture for each of the managers and ordinary employees.

With such a broad approach, even to the very issue of risk classification, managing individual risks or even groups becomes very difficult, it is in this case that an integrated approach to risk management is needed by systematizing them.

Systematization of risks involves consolidating them into peculiar groups, not by the principles of classification, but by the nature of their occurrence and, accordingly, their possible management.

II. METHODOLOGY

The basis of the risk management methodology under consideration is the dichotomy of firm strategies in a state of stability and in a state of crisis.

The stability period is characterized by the fact that the market in which the company and its microenvironment operates is stable enough, the financial risks of the company do not go beyond the standards, are easily monitored and managed. The financial situation can be described as satisfactory and self-sufficient. There are no specific threats from either the external or internal environment. Accordingly, a significant part of the possible risks are easily manageable.

On the other hand, the crisis period is a situation in which the market is subject to significant changes, its development is poorly predicted, the financial risks of the company exceed the normative indicators, there are significant changes in the micro or macro environment, respectively, the company does not meet the criteria and standards of efficiency. In such a situation, control over risk manageability weakens.

The structure of each of these risk portfolios is presented in Fig. 3.

The risk portfolio of the stability period defines such a set of risks that the organization faces throughout its entire life cycle, while their impact is within the standard acceptable values, which allows you to react and manage these risks in time. This approach is most effective in modern conditions, allowing you to stay in a stable state with minimal costs using the tools of a risk management system. Among these risks should be highlighted:

1. Risks causing the deterioration of the economic condition of the company due to changes in certain conditions in the domestic market under which the company can adjust.

2. An insufficient level of qualification of employees, affecting the performance of the enterprise, but having the ability to reduce due to the conduct of trainings and programs.

Fig. 3.Classification of types of risks

3. Risks of changes in administrative restrictions on investment, economic standards, legislative changes.

4. The risk of changes in social sentiment among the employees of the enterprise, leading to concessions by management in relation to certain requirements.

5. The possibility of losses associated with natural disasters, environmental degradation.

The risks of the crisis portfolio, in turn, are determined by the influence of external factors, which leads to serious changes in the work of the company. This portfolio includes risks that can dramatically change the course of the company's activities, as the company may have limited ability to manage these risks or their monitoring and identification mechanisms will be ineffective, which will further complicate the process of managing them.

1. Risks of emergence of integration associations, which causes a change in the basic principles of the functioning of companies in the market.

2. The risk arising from the loss by the enterprise of employees representing a valuable resource for the company, as well as the inability of the company to attract suitable personnel to the labor market.

3. Risks causing the inability of the company to meet the changing requirements of state regulation.

4. The risk of management losing control over the activities of employees, the risk of strikes.

5. The inability to conduct business activities of the subject, due to the lack of environmental conditions.

The presented systematization of risks can be considered basic, and of course it needs to be reassessed and adjusted. It should be recognized that the method of expert evaluations can be considered the most effective way to do this, because it is precisely the opinions of specialists that will allow us to effectively relate risks to the corresponding portfolio.

At the initial stage, an impact score is determined, expressed in points, which represents the corresponding rank of the indicator included in the regression equation, which is calculated by the formula:

$$a_i = \frac{Z_i}{\sum_{i=1}^{n} Z_i} \qquad (1)$$

where a_i is the weight coefficient of the i-th resource,

Z_i is the estimate of the influence (rank) of the i-th resource.

Having analyzed the obtained degree of influence on the dependent variable, we denote the smallest indicator per unit.

The next step is to assign weighting coefficients in increasing values of the regression equation. If the number of indicators for assessing the use of certain types of resources in each priority group is different, then we make the adjustment of the weight of each group of priorities to the number of simple risks in this group according to the formula:

$$d_i = \frac{n \times a_i \times k_j}{p} \qquad (2)$$

where d_i is the correction of the weight coefficient of the i-th resource,

n is the number of resource groups,

a_i is the weight coefficient of the i-th resource,

k_j is the number of resources in the j-th group,

p is the total number of resources.

The results (priority weights) in connection with the calculation error are adjusted according to the formula:

$$b_i = \frac{Z_i}{\sum_{i=1}^{n} Z_i} \div \sum_{i=1}^{n} \left(\frac{Z_i}{\sum_{i=1}^{n} Z_i} \right) \qquad (3)$$

where b_i is the weight of the i-th resource after adjustment, Z_i is the degree of influence on the dependent variable.

Further, according to the expert selection of potential risks and their grouping (market, financial, industrial, commercial, investment, innovative), the expert determines the share of each risk in the aggregate of risks. According to the formula, the weight of the group is determined according to the lowest priorities according to the following formula and the weights are calculated according to the priority groups:

$$W_q = \frac{2}{q(f+1)} \qquad (4)$$

$$W_i = W_q \frac{(q-1) \times f + i - 1}{q-1} \qquad (5)$$

The weight of each priority group is adjusted for the number of risks in this group, since it is natural that in each group the number of risks is different:

$$W = \frac{W_i \times mq}{\overline{mq}} \qquad (6)$$

where mq is the number of risks in each priority group,

$\overline{mq}$ is the average number of risks in priority groups.

To eliminate the calculation error, the results are adjusted according to the formula:

$$W_i = W_i \div \sum_{i=1}^{q} W_i \qquad (7)$$

The final step is to determine the weight of the risks for each risk included in the corresponding group, and risk priorities are set in accordance with possible losses for the corresponding risk.

For this stage, an expert group of specialists is involved, each of whom is invited to assess the likelihood of a risk using the above assessment. Assessments of experts are analyzed for their consistency, for which the method of pairwise comparison is used according to the following rules:

$$\max|A_i - B_i| \leq 50 \ and \ \sum_{i=1}^{N} \frac{|A_i - B_i|}{N} \leq 25 \qquad (8)$$

where A_i and B_i are the estimates of each i-th pair of experts.

As a result, we obtain a grouping of risks according to the probability of their occurrence based on a balanced expert assessment.

III. EXPERIMENT

We will make a more detailed familiarization with the presented method on the basis of data on the formation of a risk portfolio of a machine-building enterprise. A preliminary approach to risk management was based on the same approach to each of the potential threats, which led to overuse of resources, both labor for analysis and processing, and financial, for insurance of possible losses.

In the best traditions of risk management, a separate structural unit was engaged in risk management in the company, the functionality of ordinary employees was not included in risk management issues.

The growth of risk insurance costs, an unbalanced policy for their management, all this contributed to the understanding that it is necessary to implement a risk management approach to the entire structural vertical, that is, in fact, the company management realized the need to change the approach to the risk management culture itself.

The risk management option by systematizing them and creating a crisis and stable risk portfolio is suitable here - it was taken as the basis. The initial analysis of the weighting factors a, their corrections d and the resulting weights b of each of the resource groups are presented in Table.1

Table- I: Resource group weights

Resource groups	The degree of influence on the dependent variable / Impact assessment (ranking)	Weight coefficient, a_i	Weight correction for the number of resources, d_i	Group weight after adjustment, b_i
Material	0.09876223/1	0.2146	0.1933	0.1857
Labor	0.146547891/2	0.3174	0.2867	0.2756
Financial	0.214897543/3	0.4668	0.5601	0.5388

The table shows that the most significant group of resources that have the greatest impact on the occurrence of risk situations are financial. It is also worth noting that this is a machine-building enterprise operating in unstable market conditions. An expert sample of risks amounted to 28 risks in 10 categories. Their distribution by groups, as well as the results of calculating their weights are presented in Table. 2.

Table- II: Estimated indicators for risk groups

Risk groups	The number of risks in the group	Priority	Weights, W_1	Weights, W_2	Weights, W_3
Market risks	5	1	0.1817	0.3246	0.2718
Financial risks	4	2	0.1635	0.2342	0.1962
Production risks	4	3	0.1454	0.2069	0.1735
Business risks	4	4	0.1272	0.1817	0.1521
Investment risks	2	5	0.1092	0.0778	0.0653
Innovative risks	1	6	0.0909	0.0324	0.0272
Project risks	3	7	0.0726	0.0324	0.0653
Technological risks	1	8	0.0545	0.0196	0.0162
Legal risks	2	9	0.0365	0.0261	0.0216
Environmental risks	2	10	0.0183	0.013	0.0108

The final stage, according to the above algorithm, was an analysis of expert assessments, which showed a difference between the assessments of two experts of less than 25 for all risk categories, which is less than the minimum acceptable.

The final risk grouping by the degree of probability of their occurrence was

0-25 - 16 risks;
25-50 - 7 risks;
50-75 - 2 risks;
75-100 - 3 risks.

This clearly allows you to further adjust the formed crisis risk portfolio and remove the least probable risks from it. The most and least likely risk events are presented in Table. 3.

Table- III: Estimated indicators for risk groups

Risk probability	Name of risk	Number of points
Most likely risk event	Reduced demand for products	100
	Risk of deterioration of the financial stability of the enterprise	97
	Risk of inefficient supply chain and marketing of goods	96
Least likely risk event	Risk of property loss as a result of theft and theft	8.33
	Risk of untimely development and implementation of the project	7.5
	Risk of production potential reducing	6.47
	Risk of adverse effects of changes in exchange rates	5.34

IV. RESULT AND DISCUSSION

It should be noted that the most likely risks in the crisis portfolio were:

• risk of reduced demand for products,
• risk of deterioration of the financial stability of the enterprise
• risk associated with inefficient organization of supply and sale of goods on the market.

These types of risks were identified in the basic version of the risk portfolio of the crisis portfolio, which once again confirms the effectiveness of this technique.

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