Review and Necessity of Recognizing Risk Management in Civil Projects and Contracts

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Abstract. Proper risk management is the reason for which risk (and its various types) is assigned to that section that is able to manage it in the best way but is the section which is able to manage the risk in the best way the same party that has the most effect on the probability of an adverse occurrence or is the section that is able to manage the results in the best way after the adverse occurrence. Now by considering the size, nature and complexity of the projects, the necessity of having the techniques of managing the risk of the contract and project is considerably important. According to the basic principle of risk management, risk shall be allocated to the individuals or groups based on the ability to tolerate the risk. Allocating the risk shall be done in a way that would lead to the creation of incentive in the parties in the field of accepting responsibility and would provide the conditions for the projects' auditors to be increased. As much as the level of risk increases, the interests that might be achieved by reducing these risks by enhancing the management of the contract also increase. In this article, after recognizing and classifying the risk, we review and evaluate the existing solutions and strategies for managing the risk of contracts and projects.

Keywords: Contract, management, risk, project

1. INTRODUCTION

There is a wide spectrum of the types of contracts for providing goods, receiving services and doing various civil projects. Choosing the type of treaty is an important subject that shall be done by considering several factors such as the period of life of the project, known risks, technology, employer's ability in expressing his demands accurately, the rate if accuracy in defining the project. The organizations shall manage the contract by considering the time. Nonetheless, all of these fields and activities are not associated with each servicing contract. The level of the sources allocated to managing the contract and the type of done activities shall be presented in proportion with and justified by their potential profit. Thus, the organizations need to evaluate the potential advantages of contract management for each contract. This can be done by using two criteria.

1. Advantages that can be effectively achieved from managing the natural risks in the contract.
2. Additional potential value can be achieved from the effective contract management.

As much as the level of risk increases, the interests that might be achieved by reducing these risks by enhancing the management of the contract also increase. A contract that naturally has some risk alongside with itself and has little opportunity to achieve additional value and does not a large number of resources for managing contract, the advantages that can be obtained from for contract management will be small. Of course it is possible that when the annual expenses in the contract are considerable, even a small improvement that is created in the main contract would be considerable. Even if the risk of contract is little, the potential power for producing additional value in this contract might justify the level of sources of the management of contracts and activities. For instance, additional value can be created without additional cost through reducing...
the expenses of the development process or by convincing the employer to increase the level of service.

**Recognizing and classifying the risk of contract**

Risk, which is sometimes also called measurable risk, is a spectrum of possible results each of which are associated with an objective purpose (which might be specified through a statistic) or judgmental numerical probability. Officially, risk is defined as the measurable probability of the deviation of the actual result from the expected result (more probable). If sufficient data was available in this regard, the associated probabilities can be estimated statistically. Alternatively, the experimental subjective numerical probabilities can be attributed to each one of the results. Allocating the risk to the section that is able to manage it in the best way does not mean transferring the maximum of risk to the other party. For example, designing - construction - exploitation - support - funding contracts include more risk compared to designing – construction contracts. Determining the characteristics of the risk creates more complexity, especially in terms of time, when we accept the responsibility of lack of confidence as a separate one from risk. Lack of confidence, which we call immeasurable risk, shall be separated from measurable risk. Lack of confidence is defined as a mode in which objective purposes are immeasurable or the immeasurable probabilities cannot be measured and attributed to the predictable and possible results. Unique projects usually have more lack of confidence. All projects might contain both risk and lack of confidence factors, because most projects might be affected by the occurrences in which the probabilities cannot be measured.

At the time of making a decision about the allocation of risk, the difference between endogenous and exogenous risks (risks that can be controlled and risks that cannot be controlled). Merna and Smith in 1996 classified the risks as follows:

**Global risks (force majeure risks):** risks that are normally outside the project and out of the participants' control. Among these items we can refer to natural disasters and wars.

**Preliminary risks:** these are associated with the risk that are under the control of the project's participants and are divided into 5 classes:

**Political risks:** risks which are associated with the enhancement in the national power of the host country and are due to the particular conditions of the country.

**Credit risks of the credit receiver:** risks associated with the credit value of the company which is the executer of the project and they have been created for the execution of the project.

**Supporting credit risks:** risk associated with the change of the supporting credit rank of the financial company.

**Sovereign risks:** risks associated with the change of the governance credit rank which are associated with project's justifiability.

**Project risks:** which are the following four forms:

- Completion risk – exploitation and supporting risk – input and output risk – financial risk
Determining the quantity of the risk of contract

After the basic and important risks associated with the contract are known, the value and significance of each of them shall be specified. This can be done by evaluating the two basic factors.

- Probability of the risk's occurrence.
- The impact caused by the risk's occurrence.

Risk probability (probability)

Understanding the probability of the realization of risk is the key to evaluate its relative importance. The risk might have huge potential impact, but the probability of its occurrence might be very small and it might not be valuable enough for so much effort to manage and reduce the risk. In terms of servicing contracts, various factors can affect the probability of the occurrence of the risk.

- Technical or practical complexities of the delivery services.
- Complexity of the contract's terms and conditions. When the terms and conditions are not standard or are more complex that more effort is needed for understanding, controlling and updating towards brief conditions and standards.
- A number of required changes for the contract take longer time than its period.
- The number of domestic users or other beneficiaries in the customer organization.
- Width of the geographical region covered by the project.
- The fact that to what extent one of the parties feel that he has been deprived of his privileges through rules and regulations or business conditions, leads to the probable enhancement of conflicts.
- The nature of the supplier itself and the model of business. The probability of the supplier's failure or presentation of the issues might depend on:
  - Configuration of the supplier's internal business, for example, there is a higher risk when the supplier provides for himself only from one source that has a high probability of vulnerability.
  - Supplier's dependence on key employees, third party supplier or other key beneficiaries in providing services.
  - The experience of the suppliers in cooperating with the organization of a particular customer or in the favorite section, for example, a provider that hasn't worked in the governmental section naturally is more interested to carry the risk to a person who is experienced in this section.
  - Supplier's experience in preparing and providing the required services.

Risk's impact

Alongside with the probability of the realization of risk, the general importance of risk depends on the impact that it has at the time of its occurrence. A risk with a considerable potential impact is clearly more serious, qualified and considered than a risk with limited impact. Impact can be considered in the three key titles that were recognized above.

- Service failure can produce a wide range of potential impacts. Ultimately, service failure by an important provider can mean the stop of service presentation by the customer organization. In the general section, the weak performance of the provider can lead to the customer to not achieving the political purposes, social purposes, or delay that would cause pain, hardship and hamper for those who use these services. Service failure with less
importance (perhaps a service that is not required to completely consider the standards or required specification) has less impact on the efficiency or effectiveness of the customer organization.

- Issues associated with fame and credibility can also affect the customer organization, whereas damage, as it was explained above, might be created due to the service failure, but it is not necessarily the case. The service contract can be based on the delivered specifications, for example, the seller might have used illegal migrates and this would damage the reputation and affect the customer organization and also be effective for the provider. Nonetheless, determining the quantity of such impact is often difficult.

- Additional cost is the third potential impact. When the impact of the contract expenses is more than predicted or the budget, it can be considerable. It happens either due to weak control or change of needs or through those items for which a certain budget has not been specified (unpredicted), but it leads to the enhancement of the price of the contract (for example, when charges are attributed to inflations). Domestic costs of the customer organization can be affected as well, or direct expenses of the contract or wider costs created by the issues associated with the contract. Generally, the risk associated with the contract with high value is more effective, but specific conditions of each contract can also be effective on potential expenses.

**Combination of probability and impact**

By bringing probability and impact together, the organization can measure the importance of risks before any reductive action. In order to calculate the value, by ranking each element and then multiplying the two numbers with the ultimate one, we can obtain the "risk number". For example, probability and impact can be evaluated as scale (very simply) such as:

0 probability zero / impact zero  
1 probability low / impact low  
2 probability average / impact average  
3 probability high / impact high

By using such scale, risk with low probability but high impact will have the number (1X3)3, whereas risk with high probability and average impact will have the number (2X3)6. Processes such as this one can specify the general rank and degree of the risk in a particular contract and throughout the contract.

**CONCLUSION**

When the risk and their probabilities and impacts are recognized, the activists review those risks that they can manage in the best way. Generally, we can deal with risk in five ways: 1- avoiding risk, 2- preventing the risk, 3- risk insurance, 4- transferring the risk, 5- keeping the risk. Of course, it is noteworthy that sharing the risk creates a hard challenge especially for the activity of concluding the contract and accounting. As it was mentioned, by considering size, nature and complexity of the projects, the necessity of having the techniques of managing the risk of the contract and project is considerably important. The basic foundation of risk management is that it must be allocated to the people based on the ability to tolerate the risk. Also allocating the risk shall be done in a way that would cause the creation of an incentive in the parties in the field of accepting responsibility. According to some of the done studies, lack of required skills in the field of determining, evaluating, valuation and transferring the risk factors leads to the lack of achievement of the considered incomes. In this article, we saw the available solutions and strategies for risk management of the contract and found out that projects' success in the required technical and legal framework depends on recognizing and managing risk in the contracts and project conditions.
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