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SELECTED PROBLEMS OF MANAGEMENT IN CONSTRUCTION PROCESS

The article discusses the main phases of the management of construction process, where decisions are put on risk. Management of construction projects means managing the risk, its elimination or reduction. The risk is always present at every stage of construction projects. It is undertaken by the contractors of the project and the investor usually pays for it. In the construction process, which involves teams with different preparation, including risk management, there may be risk factors that are beyond control. The article reviews the risks in the construction process and its sources. Proper identification of risk process allows for efficient selection or reducing the risk

WYBRANE ZAGADNIENIA ZARZĄDZANIA W PROCESIE BUDOWLANYM

W artykule omówiono główne etapy zarządzania procesem budowlanym, w którym istotną rolę odgrywa podejmowanie decyzji obarczonych ryzykiem. Zarządzanie polega na identyfikacji ryzyka, jego eliminację lub redukcję. Ryzyko występuje zawsze na każdym etapie realizacji przedsięwzięć budowlanych. Jest podejmowane przez wykonawców projektu i najczęściej płaci za nie inwestor. W procesie budowlanym, w którym uczestniczą zespoły ludzkie, o różnym przygotowaniu, także w zakresie zarządzania ryzykiem, mogą wystąpić czynniki ryzyka będące poza kontrolą. W artykule dokonano przeglądu ryzyk w procesie budowlanym oraz jego źródeł powstawania. Właściwa identyfikacja ryzyka w procesie zarządzania pozwala na skuteczną dobór środków eliminacji lub redukcji ryzyka.

1. INTRODUCTION

Managing the construction process requires a comprehensive and multifaced activities. Due to the complexity and involvement of many participants the process requires the precise management. The proper management requires due diligence of constructions activities together with financing of the whole investment process. On the one hand there is the need for coordination of different branches – designers, contractors, on the other hand the multiplicity of factors that are difficult to determine at the planning stage requires constant updating and adaptation to current conditions [5,6].

The risk is more often associated with uncertainty and lack of sufficiently detailed information. There are many studies that discuss the theoretical foundations of risk and

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techniques for the identification and its management, but there is still apparent discrepancy between theory and practical side of applications in the investment process.

Researches on the risk very often are limited to analysis of the case, often in isolation of factors from different part of life having an impact on the investment.

All the problems in analysis require the multicriteria approach and taking into account all real cases encountered during execution of the investment and activities that allow for their identification leading to risk management and optimal decision. Management of the risk include assesment, classification and control of risks.

The decision related to the implementation of the project must be preceded by the analysis of risks and benefits after performance.

The active risk control concerns [3]:

- risk avoidance, e.g, abandonment of the investment,
- transfer of risk to other entities in the economic process,
- diversification of investing in different types of activities.

Management and risk control should be periodically inspected and reviewed for the effectiveness of the measures to minimize the risk, taking into account the assess whether the methods used to reduce or eliminate the risk are proper under some circumstances.

2. MANAGEMENT OF RISK

In management theory the definition of risk was evaluated in several stages. One of the first is given by Frank Hynemana Knight, in which he identifies the risk of uncertainty. Risk can be defined as a danger of damage without the will of the victim. According to the general criteria the most important types of risk are: appropriate risk (e.g. random events), subjective risk (predictions decision makers), objective risk (events that can not be predicted).

Taking into account the effect of the risk, the risk can be classified as market risk, specific risk. The source of this risk can be management, competition. Due to the time: operation risk, strategic risk, due to technological progress: static and dynamic risk. In practice the definition of bussiness risk and financial risk is used very often [7,8].

The risk management system must be practical, realistic and lead to the optimization of nvestment costs. It should not be too complicated and it can not require too much data. It is the combination of analysis, experience, evaluation, but also the comon sense and intuition. The investment risk can manifest itself: the interest rate risk, exchange currancy rate, purchase on market, non-compliance with contractual management. It must be practical, realistic, and lead to the optimization of investment costs [1].

The most common source of risk in the construction process are: the increase of inflation above the level acceptable at the formation of the investment budget, unforeseen ground conditions, bad weather conditions, design errors, bankruptcy of the main contractor, errors of coordination in implementing of the design and errors in execution, delay of works, strikes, unexpected increase in labor costs, prices of material, errors in finishing works, accidents at the construction site, low quality, force majeure (flood, earthquake), claims of contractors related to losses and costs caused by the lack of design of delay in its submission, exceeding the budget foreseen by investor, insufficient experience of contractor or subcontractor, the complexity of the investment and its installations.

Analyzing the risk it is important to see its source. Types of risk during the investments process result from: exceeding the time of receipt of the building permit, occupancy permit, experts' opinions, failure to meet required technical standards of quality, functionality, safety and environmental protection. The main effects of risk may be: low quality, delay in achieving the deadlines of execution of the projects, the discrepancy of functional needs of design solutions, destructions caused by fire or flood, incidents of employees as a result of improper system of work.

One of the major obligation of the contractor is to complete the agreed deadline of the task. There are important links of deadline of the project with e.g. crediting of the investment, scheduling of expenditures, time of return costs. Any delay cause increased investor's costs asociated with freezing the funds and may have negative consequences for other participants of the investment process.

Problems associated with insolvency of investor are carrying very severe risk consequences for the contractor, but also can bring some problems for banks crediting the investment. Due to the irreversibility and uniqueness of the investment process the risk level increases due to poor experience of contractors. Delegation of works to several contractors that approach to work differ from each other, uncertain situations can be avoided in the initial phase of the project through the proper selection of the construction , mechanical, roads contractors and inspectors. The choice of contractors need to be based on the selection procedures relating to classification and evaluation applicated in the tender procedures.

After the selection of contractors the proper allocation of risk set in agreements between parties is the essential element of managing the process.

The main consequence of the choice of the contractor is the risk of inadequate low quality of works, errors and defects that effect on the efficiency of the investment due to the efficiency, e.g. faults that are impossible or difficult to remove.

Managing the project one have to be aware of some risks from complex legal procdures which are required at the time of investment process. They are connected mainly to the time of obtaining building permission and occupancy permit. Any investment interfering in the environment carries a potential risk of protest surrounding inhabitants of the area, as well as environmental organizations which may cause temporary or defenitive stopping of the investment. Both cases may cause heavy loss by the investor.

Carrying out the investment projects outside of the euro zone one must take into account the risk of currency fluctuations, general market conditions and local economy. Currency fluctuations have a signifacnt impact on the financial implications asociated with the settlement of foreign liabilities.

Examples of different sources of risk in relation to who bears the risk are shown in the Tab.1.

Time of financing the investment may be extended, what in the absence of an immediate return may cause the need to obtain additional sources of funds and generate new costs.

Needs of investors, important from the point of safety of investment execution can be grouped in three main regimes:

- time – short time of investment,
- cost – keeping the level of the budget,
- quality – that meets the technical standards, safety and operational requirements.

Tab. 1. Sources of risk

Pos.	Source of risk	Type of risk	Entity bearing the risk
General factors			
1	Unstable political situation	Speculative risk	Contractor, Investor
2	Economic crisis	Speculative risk	Parties of investment process
Particular factors			
3	Particularly bad weather conditions	Pure risk	Contractor, Investor
4	Unfavorable contract conditions	Speculative risk	Contractor, Investor
5	Strike of construction workers	Pure risk	Market, sector, contractor
6	Unfavorable soil conditions	Speculative risk	Investor, contractor
7	Design error	Speculative risk	Designer, Contractor, Investor
8	Supervision inspector error	Speculative risk	Investor, Contractor
9	Accidents on site	Pure risk	Employee, Contractor, Investor
10	Poor experience of designer, contractor	Pure risk	Designer, Contractor, Investor
11	Cash flow problems of investor, contractor	Speculative risk	Contractor, Investor

Identification of sources of risk that causes subsequent losses, application of management strategies, proper organization of the investment process are the tasks faced by professional advisers, inspectors, contractors and suppliers involved in the construction process. Due to the nature of projects each of them requires an individual approach.

3. MANAGEMENT ANALYSIS

The main objective of risk analysis is to provide the suitable information. The more accurate is the analysis of risk the greater is the chance for proper risk assessment and achievement of economic benefits.

Therefore, conditions which are taken into account in the analysis of risk must be identified and confronted with the alternatives, allowing for better analysis of the sensitivity of solutions and of immediate effect.

The advantage of such strict risk analysis is to create an image of possible events that accompany the risky activities, in different situations and configurations that happen when entire elimination of risk is not possible. In order to identify specific size of risk the knowledge and information is needed that will enable further analysis and inference process. In the absence or insufficiency of actual data, the analysis is based on data derived from the calculation of the probability of events. The risk analysis also commonly uses the correlation analysis.

Summary of the previous discussion of risk analysis is shown in Fig.1.[2]

After a risk analysis according to previously described method the decision is much easier to decide whether the risk is acceptable or other solutions should be searched. In the investment process the risk can be often transferred to another party of the process. However, in this case it must be evaluated, which party is best prepared to control the risk and has sufficient resources to bear the consequences of failure. In the case of transfer of risk to the contractor the question is whether this risk again returns to investor in another modified form, for example in the form of higher prices for the implementation of specific actions, taking into account such additional insurance against risk.

In specific activities associated with the risk, before deciding the strategic decisions, the risks must be identified, classified and analyzed, and only later the methods of managing are chosen. In the era of technological development, especially of IT systems, most decisions are based on verified information and knowledge. Despite this the intuition based on experience plays an important role in the decision making process. It can not be, however, the only source and the basis for decisions. Risk management requires the permanent and consistent action, ie, managers must make decisions, which from the beginning to the end of the project make a logical whole.

In the process of decision-making wrong-defined risks, inappropriate methods of its reduction may contribute to increasing of the risk that existed in the early stages. To achieve planned goal, for example, execution of construction project on time and at a certain budget, the entire process of implementation in the context of risk must be analyzed on many levels, including the risk from the standpoint of the individual cells of the process, as well as from the perspective of the whole investment, taking into account the point of view of all participants in the construction process. Such situations relate to the perception of phenomena at the micro and macro scale.

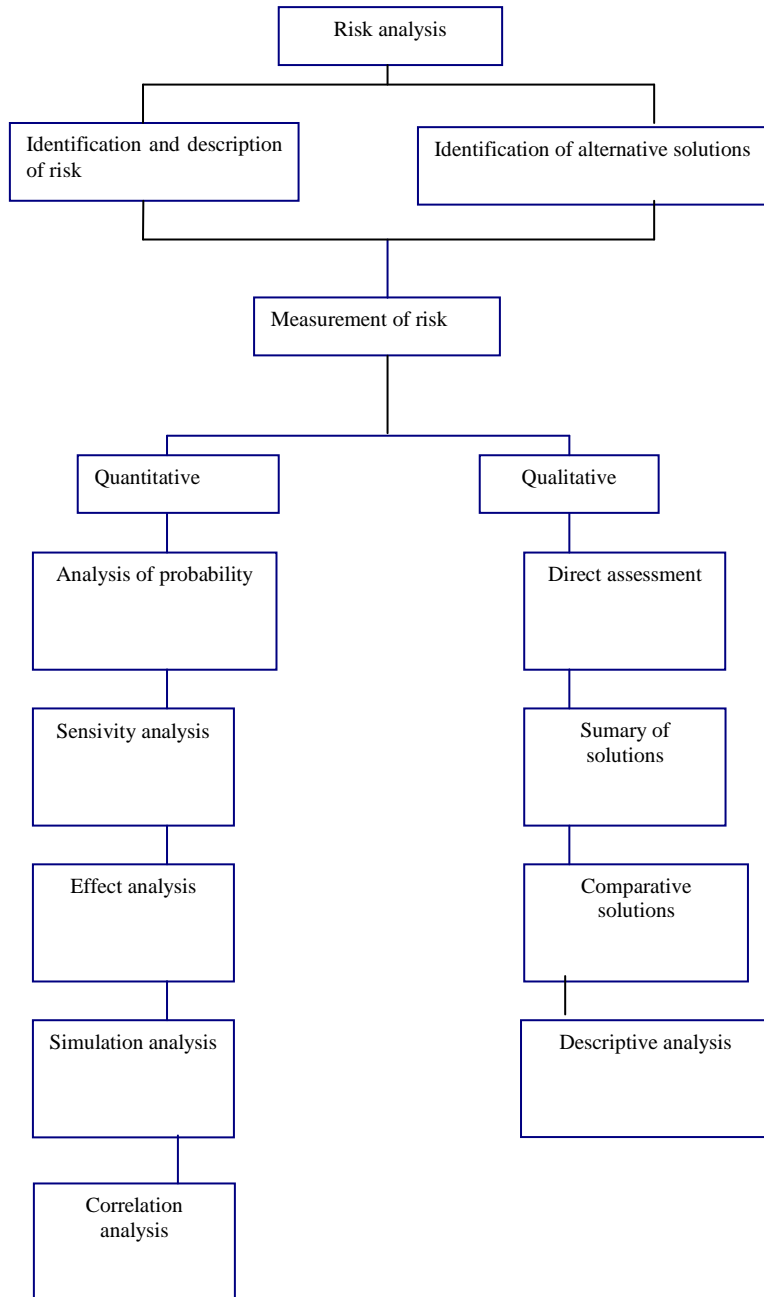


Fig.1. Risk analysis

In the process of investment, representing one of the parties it is very difficult to see the perspective of the opposing party. Already at the beginning of the project such proposals and demands of contractors, designers, and suppliers of technology should be considered, because such a broad perspective makes choosing the best decision that is not always at the beginning of the project. Especially one should avoid unexplained situations, especially those for which no solution at the moment may seem to be comfortable. When evaluating and choosing the best method of operation one should be aware of less advantageous solutions and to simulate the situation, as if less advantageous variants were selected. Another important feature of the risk management system, which is a global integrated enterprise management system, is its clarity and simplicity.

In practice the approach to avoid risks is often encountered. It assumes transferring the risk of unexpected costs to other entities. The increased costs is transferred to the investor by raising prices. Contractors often antagonize subcontractors to compete with each other and reduce their prices. Such an approach may have worked in the past, but does not nowadays. The intensification of international competition, the situation is more difficult to pass increased costs on the investor. Transferring the financial risk to subcontractors, a group of the weakest and least able to resist does not build relations based on trust and commitment. Nowadays, the risk must be identified, analyzed and distributed in a much more open and professional way.

The processes of construction projects involve different resources and a significant number of people. Construction process involved with regard to human potential is shown in Fig.2.

4. CONCLUSIONS

The paper presents selected aspects of risk management in the construction process. Proper identification of risk is a prerequisite for further managing the project. Measurement of risk and its analysis allows to find a solution to eliminate or reduce risk. In the process of construction - investment due to the multiplicity of entities involved and the complexity of determinants there are several significant sources of risk.

It seems that the analysis of diagnosis and assessment of risk in construction projects are much lower quality than the similar analysis of financial market. This state must be changed in future due to the deepening integration between the financial sector and other sectors of the economy and great value of the cash involved in the construction industry. During the implementation of construction projects there are always unforeseen circumstances, previously unplanned.

According to the author of this publication analysis the development of the construction process management continues to grow. It will go in the direction of simulating methods used in financial models, in conjunction with the optimization of funding sources.

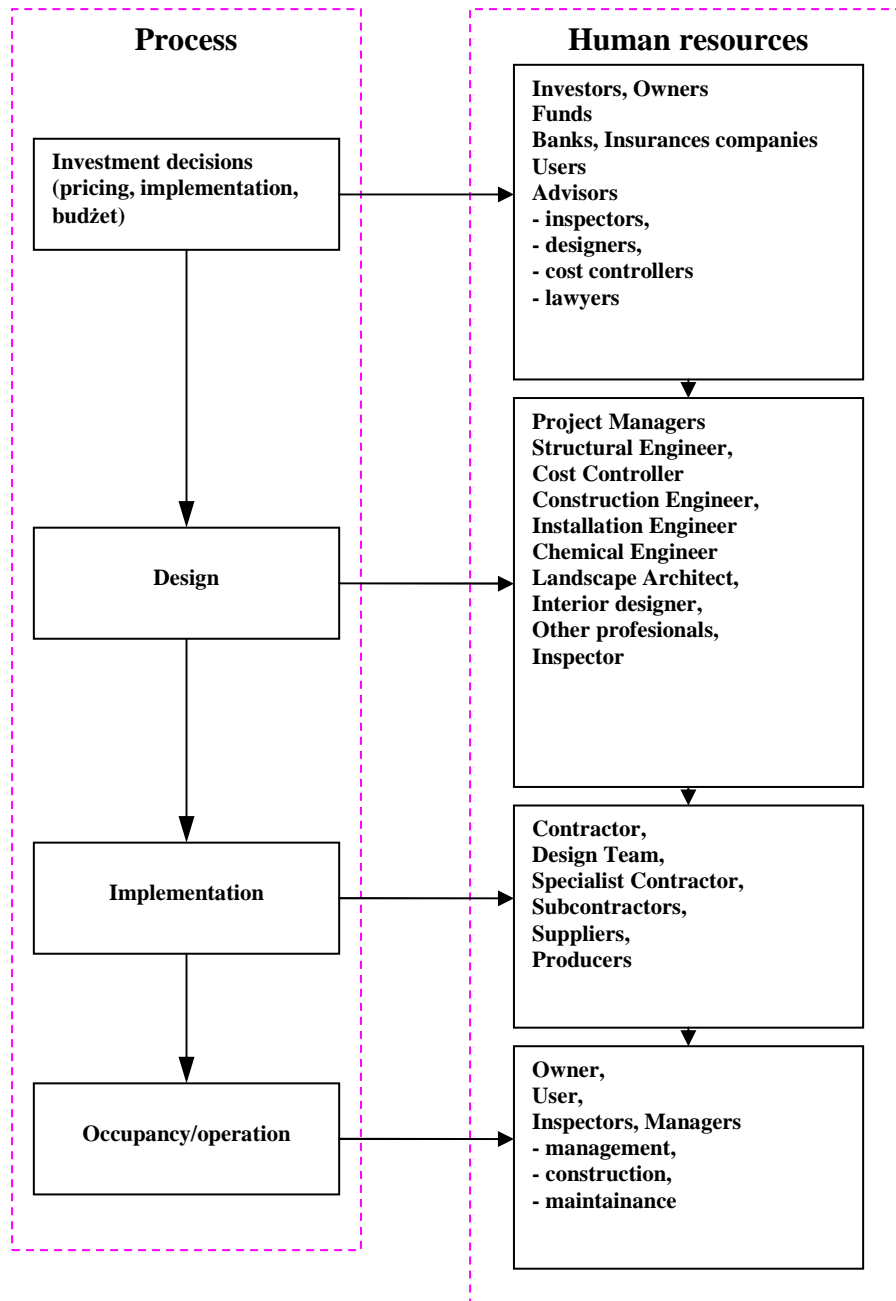


Fig..2. Human potential involved in the investment process

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