

COST MANAGEMENT CONCEPT AND PROJECT EVALUATION METHODS

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Abstract: The organizations which accepted project management concept among the first, gained a lot of advantages compared to others, such as: faster and easier adjustment to the environment, shorter accomplishment time, structured decision-making, responsibility specification, customer needs focus, etc. One of the basic factors of project management is costs because they demand fund allocation for its realization. Project management is a complex process, with business environment complexity in mind. Therefore, the issues of selection, realization and evaluation of the project deserve significant attention. The aim of this paper is to indicate project management concept advantages, the importance of project cost estimate and control, as well as evaluation method and project selection with the aim of efficiency increase for the entire process.

Keywords: project management, project costs, evaluation methods

Introduction

Project management concept is applied in modern organizations in almost all branches of the economy. Project management implies goal balancing in terms of scope, time and costs that arise during its accomplishment. Project costs management is a process necessary for project accomplishment within certain budget. There are various types of costs in the course of the execution of the project, some of them direct, others indirectly connected to the execution of the project.

Project management is a complex process which involves initiation, planning, execution, monitoring and control. Evaluation and selection methods, that is, techniques and mechanisms used to measure benefits and differences in potential projects enable organizations to select the most useful alternatives, and reject less useful ones. Proper selection of projects prevents investment failure in business, thus avoiding the consequences for individual organizations and companies, as well as wider environment.

Project management concept

A project is a single and comprehensive process, special and unique, goal-oriented, with a specified beginning which requires performance until the final set goal is achieved (Hauc, 1991). According to ISO standards, a project is a unique process which consists of a set of coordinated and controlled activities, with the beginning and ending dates, undertaken in order to achieve the result according to specific requirements within time, cost and resource limits. In order for an enterprise to be considered a project, it should have the following characteristics (Adams et al, 1979): scope of the task, oddity (ignorance), comprehensive (complexity) and project execution support. Kerzner (2017) states that a project is a set of activities that:

- Has a certain goal that should be achieved under certain circumstances;
- Has a defined beginning and ending;
- Has certain limitations;
- Implies human and other resource usage;
- Has multinational character.

Project Management Institute (PMI, 2017) offers the following definition: a project is a single enterprise, undertaken in order to create a unique product, service or another specific result. Project management implies the application of knowledge, skills and tools in order to accomplish the activities with the aim of fulfilling the project requirements. Project management process includes initiation, planning, realization, monitoring and control of the project implementation. The projects have triple limitations: in terms of scope, time and project costs. The quality

of the project is achieved through the adequate balance of the three factors.

Modern organizations realize that project management applications is more a matter of necessity, not choice, therefore this concept is applied in almost all economic branches. According to Kerzner (2010), the economic branches that achieved best results in project management application are: space exploration, military and construction industries (1960 – 1985), car industry (1986 – 1999), telecommunications (1994 – 1999), information technologies (2000 – 2003), health care (2004 – 2006), marketing and sales (2007 – 2008), State Administration (2010 till today).

Project management is the application of knowledge, skills, tools and techniques in project activities in order to achieve relevant project participants' requirements and expectations. Project management key elements are presented in table 1.

Table 1: Project management key elements

1	Scope management	Definition and management of all the work required for successful project realization
2	Time management	Time estimation for each stage of the project, dynamic plan development and the insurance of well-timed realization
3	Cost management	Project budget preparation and management
4	Quality management	The insurance the project will meet the needs it is launched for
5	Integration management	The ability to integrate various aspects of project management
6	Human resource management	Effective usage of personnel involved in project realization
7	Communications management	Project information generation, collection, forwarding and storage
8	Risk management	Identification, analysis and reduction of risk related to the project
9	Procurement management	Procurement of goods and services necessary for the project by external organization

The source: Jergras, G. F., Hartman, F. T., (1994)

The advantages of the organizations accepting the project management concept are reflected in faster and easier adjustment to the environment changes, better direction towards customer needs, possibilities to manage multiple activities, shorter realization time, faster innovation acceptance, better functional unity coordination, planning and control integration, etc.

Project cost estimation and control

Project management implies the balance of goals in terms of scope, time and costs. Project costs management is a process necessary for project realization within certain budget. Therefore, the project managers have to define the project well, estimate the time and costs in a realistic manner. Four project cost management processes are (PMI, 2007): cost management planning, cost estimation, budget setting and cost control.

Project costs are the funds necessary for the realization of the project, and they are some of the basic factors of management (Jovanovic, 2003). Costs are the resource sacrificed or spent in order to achieve the specific goal (Hongren et al, 1994). Project managers, in cooperation with financial experts, do the estimation of project costs and benefits throughout the project's life cycle.

Project managers make several types of cost estimate, and three basic estimate types are: rough estimate, budget estimate and final estimate (Schwabe, 2015). In the course of project realization there are various types of costs; some of them are direct (they can be easily related to product manufacture or service offer on the project), others are indirect costs, not directly related to product manufacture or service offer, but indirectly related to project execution. Project

managers have little influence on their amount.

Most frequently used methods and techniques in cost estimate are (Schwabe, 2015): analogous estimate, bottom-up estimating, resource cost rate parameter modeling, suppliers' offer and reserve analysis, project management software. The analogous estimate uses real costs of the previous similar projects as a foundation for cost estimation in the current project. It implies the expert knowledge, as well as the similarities of the projects compared. The bottom-up estimates are based on the assessment of individual activities and their summing up at the level of the entire project.

The most common reasons of incorrect project cost estimate are (De Marco, 1982): estimates are performed quickly, lack of experience in estimations, underestimation of certain types of costs, the efforts to get a large contract or internal funds. Considering that many projects do not develop according to plans, new or altered cost estimates are necessary, with the aim of finding alternative solutions. The problems are even more complex in organizations that simultaneously implement several projects or investments as a set of interrelated activities integrated in the portfolio.

Considering the complexity of the economic environment where companies do business, it is evident that additional attention must be paid to the issues of investment projects selection, implementation and evaluation. First of all, it refers to the financial construction part of the project because of interest rates, high accompanying costs of lending, currency clause in contracts, mortgage loan securing, etc. On the other hand, the companies have insufficient funds for investment project funding so they are forced to accept unfavorable conditions to obtain the borrowed funds.

There are a lot of underestimated or even overlooked cost items in projects, but they can lead to various financial and business problems later.

Investment failures are quite common in the economy, and the largest number of losses in companies appear mainly as a result of irrational and ineffective investment. A large amount of wrong capacities and large losses based on them, as well as other investment failures, are a constant warning that, not rarely, investments do not lead to development, but to its opposite – companies' weakness, loss and liquidation. Consequently, the problems of rational investment, that is, investment project efficient planning and realization belong among the key problems of the development in every company.

Project evaluation and selection methods

The organizations often have insufficient funds available for the implementation of all necessary projects, and they are forced to make a selection. Evaluation and selection methods, that is, techniques and tools to measure benefits and differences from the potential projects enable the organizations to select the most useful alternatives and dismiss less useful ones. Project selection methods can be financial, marketing or based on logic or politics. In most of the cases, the decisions are made as the combination of several various methods.

Selection methods measure the total value of certain product, service or other project results for the organization. The values measured in project selection and ranking are the factors such as market share, financial benefit, return on investments, customer relations, public opinion, etc. On

the basis of PMI (2017) standards, there are two types of selection methods, and they are: mathematical models and benefit measurement methods.

Mathematical models use linear, dynamic, non-linear, multi channel and integer programming in forms of algorithms, and they are all used in the case of large and complex projects. Most organizations use measurement methods in the process of project selection, such as: cost-benefit analysis, evaluation models and various economic models based on cash flow analysis.

Cost-benefit analysis is one of the most frequently used methods, based on cost and benefit comparison for the organization in the project realization. Evaluation models represent a simple technique, based on the criteria such as expected profit, market share, ease of products or services, etc. Most frequently used methods of cash flow analysis are the return period on invested funds, discounted cash flow, net present value and internal rate of return.

The time of the investment process and the accompanying uncertainty are very important characteristics of the process. The period of time between the present investment and the effects expected in future is often very long, and most often has a determining influence on the efficiency of the entire investment process. The effects expected in the future are uncertain because the future itself is uncertain, too. The present investments are only an assumption that the effects achieved in the future will be larger than the investments. The longer the investment time, that is, the further the anticipation of the effects in the future - the greater the uncertainty.

The influence of the failed investment is not just limited to the company in question and those related to it, but it spreads much wider, often across the entire branch of the economy where the company does business. In time, these consequences lead to a slow-down in positive results, stagnation and losses, as well as gradual lagging of the company in comparison to other competitive companies, technological development lag and inability to achieve its own development at the required pace.

Regardless of the complex selection process, and inability to measure and compare the investment projects quickly, investment decisions are often made on the basis of intuition and empiricism, less frequently on the basis of the exact budget. Investment decisions are often made without extensive studies and the investment studies are made only after the decision is reached with the aim of financial resource achievement. It is certain that, among other things, the lack of scientific preparation is one of the basic causes of company investment failure and inefficiency. The usage of the appropriate methodologies in investment project preparation and evaluation is the only correct way for investment decision efficiency improvement as well as the investment project implementation overall efficiency.

Investment project profitability evaluation uses mainly static and dynamic methods, that is, criteria. Static investment criteria are mainly used as additional criteria or investment project fast evaluation criteria (Djuricin, Loncar, 2010). These methods are simple and easy to understand from the calculation point because their essence is

based on the representative year effects, neglecting the time as a calculation factor. The basic defect of these methods is that they disregard the time factor.

Investment is a specific process that cannot be evaluated with the same methods as the previous business of the company considering the fact that the investments refer to the future as well as a longer period. Therefore, it is necessary to consider investment funds dynamics, their scope in periods, dynamics and structure of the effects expected in future and the total lifetime of the investment in order to have a practical investment project evaluation (Barac et al, 2004).

Dynamic criteria respect the time value of cash, while investment projects costs and benefits are expressed in cash flows. These criteria start from the fact that cash has a higher value at the moment of its investment than investment return; thereby, we do not think of money devaluation due to inflation, but we start from the economic logic that money invested in an investment project should always have a certain return. The basic dynamic criteria for investment project profitability score are net present value, profitability index and internal rate of return.

Conclusion

Considering the complex economic environment where companies and organizations do business, it is necessary to pay additional attention to the issues of investment project selection, implementation and evaluation.

It mainly refers to the financial part of project construction due to the influence of various factors affecting project implementation costs and time, as well as the income from specific project implementation. The economic theory and practice have developed a number of methods for project selection, such as financial, marketing, logic, etc.

PMI standards use various mathematical models and benefit measurement methods, such as cost-benefit analysis, evaluation models and various economic models based on cash flow analysis. Investment project profitability evaluation is frequently conducted with static (which do not evaluate time value of money) and dynamic methods evaluating time value of money, with net present value, profitability index and internal return rate being the most common in practice.

References

1. Adams, J.R., Brandt, S.E., Martin, M.D., (1979) *Managing by Project Management*, Universal Technology Corporation
2. Barać, S., Ivaniš, M., Jeremić, Lj., (2004) *Upravljanje finansijama*, Univerzitet Singidunum, Beograd, s. 403.
3. De Marco, T., (1982) *Controlling Software Projects*, Youordon Press, New York
4. Djurićin, D., Lončar, D., (2010) „Menadžment pomoću projekata“ Centar za izdavačku delatnost Ekonomskog fakulteta u Beogradu, str. 367.
5. Hauc, A., (1991) *Upravljanje projektima*, Informator, Zagreb
6. Jergras, G.F., Hartman, F.T., (1994) *Contractors construction-claims avoidance*, J. of Constr. Eng. And Manage, ASCE, 120 (3). 553-560.
7. Kerzner, H., (2017) *Project Management: A System Approach to Planning, Scheduling and Contoling*, John Wiley & Sons, New York
8. Project Management Institute (2017) *A Guide to the Project Management Body of Knowledge*, 60th edition, Newtown Square
9. Kerzner, H., (2010) *Project Management Best Practices: Achieving Global Excellence*, John Wiley & Sons, New Jersey
10. Jovanović, P., (2003) *Leksikon menadžmenta*, Fakultet organizacionih nauka, Beograd
11. Hongren, C., George Foster, Srikanti, M., (1994) *Cost Accounting*, Englewood Cliffs, NJ: Prentice Hall
12. Schwalbe, K., (2015) *Information Tehnology Project Management*, Cengage Learning