

USE OF THE FUNCTIONAL VALUE RATING METHOD IN THE MANAGEMENT OF PUBLIC WORKS PROJECTS

Summary of the doctoral thesis

Results of public works arouse public concerns mainly due to the scale of investment and the expectation that they will be implemented in an effective manner. In practice, projects are implemented within the group of project stakeholders. In this case, value systems, which are guide individual stakeholders may be different. Stakeholders categorise different requirements for a planned building. It is possible that the expectations differ substantially. For this reason it is not possible to identify a solution that will satisfy all. Hence, the notion of efficiency can have different meanings for different stakeholders.

The lack of communication is a significant factor affecting the process of public works project. Other factors are unrealistic expectations, lack of teamwork, misunderstandings, unpredictability. These factors are mainly derived from a clear definition of expectations in terms of objectives and expectations, which a planned building is to meet. Therefore there is a need for early identification of the criteria that will be used to evaluate the solutions presented by a designer. The designer is therefore aware if he is moving in the right direction. A platform to reach an agreement and evaluate the design from the life cycle cost perspective is value management. The method is widespread in public works in USA. The experience indicates that the value management used during the course of the project reduces some conflict causes. Sometimes it can change the conflict into a constructive process. The overall aim is to make the building more coherent with the stakeholder's expectations.

The main reason for this thesis was the author's professional experience and observations carried out during construction projects. These observations can be summarised in the following points:

- no regard to the life cycle costs of a building,
- miscommunication between the owner and the designer,
- construction of buildings that are expensive to maintain and with a disadvantageous cost to utility ratio.

The observations led the author to examine applicability of value management to evaluate public works projects in Poland at a technical design stage of the project. The results of the method usage abroad prove the commitment is worth its cost. The results can be summarised as improved functionality, balanced life cycle cost of the building and improved value for money ratio.

The thesis is focused on a design stage of projects, which is a complex issue that determines the final product of a project. The design stage is about interaction between the owner (including the end user) and the designer. The thesis focuses on the state owned client that carries out a project that meets some important public needs. While the owner's incompetence is usually pointed as the main cause of obstacles, there is no explanation as to why it is happening. The research points out a high competence of the owner's representatives. At the same time competent people face lack cooperation and understanding by the end users who have to define the expectations. This impacts the process significantly and results an overall negative opinion about the state owed investor because of the complications during the design stage.

Based on the literature review this research problem was defined as two research questions:

P1: Does the Polish state owned investor consider life cycle cost when planning the building?

P2: How the public works project in Poland and USA are similar and what are the differences?

The answers to these research questions were the starting point for completion of the research objectives. There are two main research objectives defined: one cognitive and one practical. The cognitive objective was to examine the possibility of value management utilisation in the course of public works projects aiming to improve the projects effectiveness. The practical objective was to propose a method of structures technical function examination at a design stage. The main objectives comprised specific objectives listed below.

CS1: Definition of the knowledge on the planning and design stage of the public works projects in Poland.

CS2: The practice and results of the functional analysis based on US methods.

CS3: An empirical study based on the public works projects at a design stage.

CS4: A concept of introducing value management to Polish public works projects.

CS5: Case studies of the projects based on data collected during the empirical research.

CS6: Comparative analysis of the proposed method against a similar practice in the US.

The research questions P1 and P2 are answered during completion of the specific objectives CS3 and CS6. The CS1, CS2, CS3 and CS6 formulate a group of cognitive objectives. The other specific objectives (CS4 and CS5) form a completion of the practical objective. The framework for the practical objective was defined utilising information collected during completion of the cognitive objectives.

Resulting from the study case analyses a number of actions based on function analysis were recommended. The cases were public work projects. The proposed method objective was to improve the life cycle costs of buildings and protect the functionality together with satisfaction of the end user.

The thesis aims to set conditions for the public works projects at the design stage in order to maximise benefits of the value management, reduce or minimize obstacles in the method usage and evaluate prospective benefits of the value management introduction. The predictions are based on the information gathered when studying the public works processes in the US.

Chapter I is presents literature review. This covers technical planning, investment planning, cost control, lifecycle costing and value management. The publication topics comprise management theory, project management and practical guides to the project management in construction. The literature review also included relevant laws.

Chapter II is a report from the empirical research.

Chapter III presents the concept of the value management introduction in Polish public works projects. The concept is aimed to improve the management of the process therefore it is not in collision with the public procurement law. The public procurement law is going to change in year 2016 due to the 2014/24/UE directive of the European Parliament. The proposed method can be used to meet the requirements of the new legislation. The anticipated impact of the method on polish economy is discussed.

Based on the literature review and findings of the empirical research, challenges in the course of the public works projects were listed. Details of aspects with a negative impact on a functionality and a life cycle costs were identified. In the view of beneficial outcome of value management analysis the following topics were discussed:

- The concept of value management introduction to Polish public works projects at the planning and design stages.
- Analytical model to evaluate alternative methods identified in the workshops.

Number of benefits were identified in the process with the major one being: direct financial savings. Further benefits of value engineering are listed below:

- specific needs and expectations awareness,
- clear statement of the owner's needs,
- rationalisation of the owner's expectations
- common search for alternative solutions,
- forcing the parties to improve understanding of the other stakeholders by engaging in cooperation.

The thesis fills the gap bordering technical and social sciences. It aims to increase the awareness of the investment process problems among the social sciences representatives. Due to its interdisciplinary nature, the thesis can be of value for managers as well as for engineers, who face managerial problems. The research outcome can be used in following areas: economic policy, teaching and practice of the project management.

The thesis opens two essential research areas of the design process in the public investment. Under current conditions the impact of the design quality onto the construction can be examined. The second area opens if the value management is introduced. An impact of the practice onto the design process should be examined in Polish conditions.