

## **APPLICATION OF TOOLS AFFECTING ORGANIZATIONAL ASPECTS OF PROJECT MANAGEMENT - RECOMMENDATIONS FOR PRACTICE OF METALLURGICAL COMPANIES**

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### **Abstract**

The paper is dedicated to application of project management tools affecting organizational aspects of project management, i.e. organizational standards for support of project management and project management offices in the context of project management of metallurgical companies. The authors aim to characterize tools affecting organizational aspects of project management in the form of organizational standards for support of project management and project management offices, to assess their utilization in the Czech corporate practice, and to formulate recommendations for their application by metallurgical companies. The paper is based on the literature review, which was followed by a quantitative research in the form of a questionnaire survey, and a qualitative research in the form of directed interviews. The first part proposes an overall typology of corporate projects and explains the essence of organizational standards for support of project management and project management offices. The next part analyzes and evaluates the scope of utilization of the above mentioned tools by managers of metallurgical companies operating in the Czech Republic and compares it to the domestic and foreign practice. Subsequently, the authors formulate recommendations for metallurgical companies concerning application of the above mentioned project management tools.

**Keywords:** Metallurgical companies, project, project management tools, organizational standards to support project management, project management office

### **1. INTRODUCTION**

The effectiveness of implementation of any type of a corporate project is determined by the level of project management in the given organization, which is affected by the rate of knowledge and the scope of utilization of project management methods and tools by the company workers. Application of project management methods and tools is of particular importance from the point of view of companies of such national economy branches that are strategically important, technologically interconnected, investment intensive, and socially sensitive, be it from the point of view of environmental or social risks. Such companies include metallurgical industry companies.

The problem of project management of metallurgical companies is then of even a greater importance in relation to the current possibility of project support from the EU sources, which represents an important opportunity for these companies. The EU sources may constitute a decisive source of financing without which it would not be possible to implement a number of corporate projects. Metallurgical companies can obtain, within the current Programming Period 2014 - 2020, significant financing sources, especially from the means of the operational programs of Enterprise and Innovations for Competitiveness, Environment and Employment. The success of applications for project support, but also implementation of these projects itself, will be affected by the level of knowledge and the rate of application of adequate project management methods and tools.

Metallurgical companies can solve a wide range of various types of projects, where they can apply different project management methods and tools [1]. It is essential to pay a particular attention to methods and tools that are primarily applicable within the entire project life cycle. These may include the organizational standards for support of project management and project management offices [2]. The authors of this paper aim to characterize tools affecting organizational aspects of project management in the form of organizational

standards for support of project management and project management offices, to assess their utilization by metallurgical companies in the Czech corporate practice, and to formulate recommendations for metallurgical companies.

## **2. LITERATURE REVIEW**

Projects solved by metallurgical companies can be of a different character, be it from the point of view of the size of their budget [3, 4], the time [4, 5], their complexity [3, 6], the character of outputs [3, 4, 7], the rate of risk [3, 8], or the way of financing [9]. For clearer arrangement, the points of view taking account of the size of the project budget, its time intensity and complexity can be, in our opinion, condensed into a single classification into small, medium, and large projects. Small projects refer to projects with a smaller budget, not very time-consuming, with low complexity within planning and implementation of the project outputs. Medium projects include projects with a larger budget, more time-consuming, ensuring creation of a more robust project output, with more complex planning and implementation. Large projects can be characterized as extensive projects with a large budget, time-consuming projects, which aim to ensure extensive outputs through application of complex procedures within planning and particularly within implementation. Project classification according to this typology is relative and depends of a particular situation.

A particular type of project affects the choice of project management methods and tools it is purposeful to apply within individual stages of the project life cycle. Specific project management methods and tools can be applied within the entire course of the project life cycle. These primarily include tools affecting organizational aspects of project management in the form of organizational standards for support of project management and project management offices.

Organizational standards for support of project management consist of documents summarizing procedures, methods and tools that are recommended for application in the given organization within project management [10]. As the studies conducted by Joslin and Müller [10], Lappe and Spang [11], or Milosevic and Patanakul [12] imply their introduction on the level of the organization increases the success of project implementation. However, their application can only be successful on condition that the company employees are made familiar with these standards through regular training [13]. The character of organizational standards for support of project management can be different. They can either only include individual templates of obligatory documents, specify the scope of unified documentation and rules for continuous project monitoring, or also include clearly defined procedures that have to be followed within the course of project management. [14, 15] To create organizational standards, it is possible to use project management standards, e.g. in the form of the Project Management Institute standard [16], PProject IN Controlled Environments 2 standard (PRINCE 2) [17], or International Project Management Association Competence Baseline standard [18], and also in the form of the standard ISO 21500:2012 Guidance on project management [19].

Project management office (PMO) represents an organizational unit with a different scope of responsibility according to the rate of centralization or independence of projects falling within its competence. Its responsibility spans from provision of the basic project support to direct management of individual projects. [16] The position of PMO in the organizational structure is related to the scope of its functions, where it is possible to distinguish four basic types of PMOs, see more in [20, 21, 22]. Supporting PMOs provide project managers and project teams with advisory support both in planning and in implementation, but also when the project has been completed. They also create organizational standards for support of project management, organize professional training, and provide administration of documentation after completion of the project. In addition, controlling PMOs ensure monitoring of the planned, implemented, and completed projects, ensure checking of observance of the organizational standards, take part in project evaluation, and ensure project audits. Apart from the above activities, coordinating PMOs take an active part in project planning, implementation and completion in the form of engagement in the project teams or in the form of occupation of the position of the project manager. Partnering PMOs then also carry out seeking, identification, and selection

of preferred projects to fulfil the strategic objectives of the company, and they also share and transfer the experience.

### **3. RESEARCH METHODOLOGY**

The presented paper integrates the theory and practice of project management, focusing on the metallurgical industry companies. The ground of the paper was the literature review aiming to make an overview of the current knowledge of the solved problems. It was based on a critical analysis of professional books and journals, conference proceedings, but also documents published by relevant institutions on web pages. The choice of sources for the literature review depended on the significance and up-to-datedness of the given source.

The secondary analysis was followed by quantitative and qualitative research. The quantitative research in the form of a questionnaire survey from February to April 2013 aimed to assess the scope of application of selected project management methods and tools by solvers of projects co-financed by European funds within the Programming Period 2007 - 2013 in the Czech Republic (CZ). The respondents were chosen from the database of projects solved within the Programming Period 2007 - 2013, published by the Ministry for Regional Development of the CZ on 6 February 2013. 500 projects were chosen from this database (1.2 % of the total number) on the basis of randomly generated numbers within the application of Microsoft Office Excel. The questionnaire was then published on the Internet in April 2013 using the application of Lime Survey, and representatives (project managers or project coordinators) of all the randomly selected projects were contacted by email in two rounds. We received 171 filled-in questionnaires, i.e. the response rate was 34.2 %. The obtained data were subsequently processed in MS Excel.

The qualitative survey focusing on suitability of application of selected project management methods and tools with respect to the type of the solved project was conducted in the form of directed interviews, which were two hours long on average. The respondents were representatives of selected industrial companies of all sizes doing business in the area of the CZ. Specifically, they were project managers and other persons responsible for project management. The qualitative survey was implemented in two stages: one was conducted from June to October 2014 with representatives of 8 chemical industry companies, the second from October 2015 to March 2016 with representatives of 7 metallurgical companies and 6 mechanical engineering companies. The article only presents the responds of metallurgical companies.

On the basis of the literature review, but in particular of the outcomes of the performed surveys and taking account of the practical experience of the authors of the paper with project management, the authors have formulated the findings concerning tools affecting organizational aspects of project management presented in the paper and recommendations for their application by metallurgical companies.

### **4. RESULTS AND DISCUSSION**

The directed interviews with metallurgical companies discovered that these companies implement different types of projects - investment projects, research and development projects, project with an impact on the environment, project in the social area of corporate activities, and other types of projects. They are usually large projects, but there are also middle-sized and small projects. Therefore, it is suitable to assess whether these projects are managed using project management methods and tools, i.e. among other things the organizational standards for support of project management and PMOs.

Organizational standards for support of project management represent a tool that is widely used abroad. As the worldwide survey of the Project Management Institute - PMI (2800 respondents) conducted in 2015 implies, this tool is applied by 94 % of the respondents [23]. A different situation is in the CZ, as it is shown e.g. by a research conducted by SPR, which also mapped the period of 2015 on the sample of 141 respondents. Within this survey, application of organizational standards for support of project management was confirmed by 56 %

of the respondents only. [24] It is comparable to the finding of our research specifically focused on projects co-financed from the EU sources, within which application of these standards was confirmed by 59 % of the company representatives.

As for the metallurgical companies assessed within our research, the situation is similar. 2 out of 7 assessed metallurgical companies do not apply the organizational standards for support of project management. Even if the organizational standards for support of project management are applied, they are not, in either case, linked to the international project management standards. As for the scope, they mostly specify the scope of unified documentation and rules for continuous project monitoring.

As for application of organizational standards for support of project management, as shown by the performed survey, their application can particularly be recommended in metallurgical companies implementing mainly large projects. At the same time, the success of their specification and application grows together with the number of projects implemented in the organization. Incorporation of organizational standards for support of project management into the internal organizational standards is also suitable in metallurgical companies solving medium, or also small, projects. However, if mainly small projects are solved, it is suitable not to draw up these standards to such an extent and detail. In addition to that, it is possible to recommend application of an international project management standard (IPMA, PMI, or PRINCE 2) and ISO standards when processing the organizational standards for support of project management, and to extend their scope in the way to include, among other things, clearly defined procedures.

The fact is that specification of organizational standards for support of project management helps in project preparation, planning, implementation, and evaluation on the level of the organization. These standards help to unify procedures within the solved projects and to ensure adequate project documentation. The main advantage of organizational standards is that they ensure a single manual to working procedures for project solvers, and also unification of project procedures on the level of the organization, but also acquisition of single and comparable documentation to all projects. On the other hand, their application results in an increase in project administration demands and also in a decrease in the creativity of the project team members when applying project management.

The second project management tool affecting its organizational aspects is a PMO. As for its application as compared to the foreign practice, the situation in the CZ is, compared to organizational standards, more favorable. The PMI research implies that PMOs are used by 69 % of the respondents [23]. In the survey conducted by Ernst & Young in 2013, focused on the level of project management in the CZ and involving 69 organizations, the presence of PMOs was confirmed by 60 % of the respondents [25]. The survey conducted by SPR then shows that the percentage of organizations using PMOs is growing, and 58 % of the respondents are using them. 41 % of the respondents then use PMOs together with organizational standards for support of project management. [24] Our research focused specifically on projects co-financed from EU sources implies that PMOs are used by 56 % of the company respondents within these projects.

The assessed metallurgical companies were asked whether they have a PMO in the organizational structure, and if they do, what type of a PMO it is. The assessed metallurgical companies confirmed that they do not use a PMO within project management very much in their practice. Only 2 companies use a PMO. They are companies implementing, among other things, research and development projects. As for the PMO type, it is a controlling PMO in both cases.

A PMO represents a specific project management tool. As the conducted survey shows that its incorporation as a new organizational unit into the company organizational structure is particularly purposeful in companies implementing mainly large projects, i.e. among others in metallurgical industry companies. Establishment of a PMO can also be considered by metallurgical companies mostly implementing medium projects. In the case of companies usually implementing small projects in a smaller number, it is not possible, in view of the fact that establishment and operation of a PMO is connected with significant costs, to recommend its utilization. In

view of implementation of projects of various sizes and scopes, it is definitely possible to recommend this tool to metallurgical companies.

A PMO can ensure various levels of support within application of project management. The scope of PMO functions has to reflect the number of implemented projects, programs, or the scope of the portfolio on the level of the company, to take account of the type of the implemented projects and also the scope of project management methods and tools applied by the company. The conducted research shows that even in our conditions it is possible to see the main benefit of PMOs in the fact that they provide project solvers with a number of supporting services on the level of the organization and that they make it possible to increase the control over the course of project implementation, as it is also documented in the professional literature, e.g. [25, 26]. On the other hand, it is not possible to forget the above mentioned costs relating to the operation of a PMO.

## 5. CONCLUSION

The project management theory and practice offer a number of methods and tools, both those specific for the area of project management and those taken over from other scientific branches. It is possible to apply them in different project life cycle stages. The paper pays attention to the tools affecting organizational aspects of project management that can be used in all the project life cycle stages, i.e. to organizational standards for support of project management and PMOs. It explains the essence of these tools, assesses their utilization in the practice of metallurgical companies as compared to the domestic and foreign practice and formulates recommendations for their application by metallurgical companies while taking account of the proposed project typology, i.e. large, medium, and small projects.

The benefits of the presented paper can be seen, on the one hand, in the evaluation of application of organizational standards for support of project management and PMOs in the Czech corporate practice mainly in practice of metallurgical companies and, on the other hand, in the formulation of recommendations for application of these project management tools in the practice of metallurgical companies. A limiting factor of the presented paper can be found in the limited number of respondents involved in the qualitative survey. In the following research it is also possible to focus attention to assessment and formulation of recommendations for application of some other project management methods and tools by metallurgical companies.

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