

SPECIFICS OF PROJECT ORGANIZATION IN CONSTRUCTION

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Abstract

Construction is a large-scale dynamic and complex industrial sector playing a major part in global economics. Construction manufacture is characterized by certain specifics, which distinguish it from the other types of productions in the branches of the national economy. These are related to the organization, nature of the product, the necessary resources, including the capital, duration of product creation, duration of use – operation, the number of participants in creating the construction production, etc. Being familiar with the inherent characteristics of project organization in construction is useful for the effective implementation of construction projects by entrepreneurs.

Keywords: *construction projects; organizations; specifics; methods*

JEL Codes: *L74, M10*

Introduction

The management of construction projects can be determined as direction, regulation and supervision of a project from its early development to its completion. The ultimate purpose of the management of construction projects is the complete satisfaction of the customer requirements both in terms of functionality and in terms of budget. The main concept for the management of construction projects is closely related to technical parameters like budget and performance but also requires solid communication between all agents (stakeholders, contractors, community). Especially for the accomplishment of successful implementation of construction projects great importance is ascribed to the correct project organization. To accomplish this purpose, it is necessary that entrepreneurs know the specifics of project organization in construction.

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Specifics of construction projects

According to L. Tishtenko, regardless of the type of the specific construction site, each construction is preceded by drawing up a design and development of a project for its management. On this basis, he believes that „the notion of designing in the field of construction can have a double meaning“ – in the technical aspect and from the manager’s perspective (Tishtenko, 2012). His opinion is that „in the technical meaning the project is a document determining the general order and specified terms for construction and handing over of the site for operation“. It contains detailed and summarized information of the scope of works and the necessary labour and material and technical resources, i.e. in this particular case, the project is regarded as „a model of the future building and also of the costs related to implementation of its construction“ (Tishtenko, 2012). Upon reviewing the construction site from the managerial perspective, the author points out that „it is necessary to define the obligations and level of responsibility of each of the parties, the manners of accountancy before the project assigning party, etc.“. On this basis, according to him, the project in the field of construction should combine both the engineering (technical) part of this term and the managerial one“ (Tishtenko, 2012).

L. Tishtenko emphasizes that „under the term of „construction project“ we should understand the purposeful limited in time activity directed to the creation of a new construction site, performance of reconstruction, modernization or repair of an already existing building“ (2012).

I. Sakarev described the construction project as „an aggregate of all activities related to the creation of new or the renovation of existing main funds of production or non-production intended purpose“ (1997, p. 7).

In relation to the management of projects in the construction industry, P. Morris states: „In industrial construction project management is a generally recognized practice but nevertheless it is not considered as a basic professional discipline. In building and civil construction project management receives even less attention, by being considered, at best, as a continuation of the site management or an assessment of the costs“ (Morris, 2005).

Construction projects are distinct with certain specifics of their own. E. Zagorodnova and O. Khvorostukhina have determined the following specifics of the construction projects (2015):

- The product of the project implementation is a building or facility;
- The natural and geographic conditions often influence the successful implementation of the construction projects;
- High dynamic of the physical conditions for works performance;

- Availability of a large number of participants in the project having an impact on the implementation;

- Operational acceptance of decisions.

In relation to the implementation of the construction projects A. Sprude reviews as significant the following specifics of the construction projects and organization of their performance:

- Necessity of a complex of knowledge in various fields of management: general management, financial management, personnel management and many others for successful realization of the project;

- Presence of habits to work under the conditions of limitation of resources and information uncertainty;

- Necessity that the management of the construction projects should take place by specially prepared professionals, having the necessary scope of knowledge and having sufficient practical experience (Sprude, 2012).

Other specifics characterizing the construction projects are: their quality (of the design documentation, technological quality of the design; technical and economic quality of the project, statutory quality – the level of observance of construction requirements), the level of their innovation (in terms of the level of innovation in materials, equipment, construction technologies, site operation, the technical and economic plausibility of introducing innovation) and the level of competitiveness. They characterize both the designing process and the process of implementation.

L. Tishtenko states that „the project in the field of construction should combine the engineering (technical) aspect of this notion and the managerial aspect as well“, along with the fact that each construction is preceded by the drawing up of a project – design and development of a system for its management“ (2012).

Project planning and management methods

They are founded on the assumption that all activities can be divided into small controlled tasks. Thus, the building of each site can be regarded as a project, which means as a large-scale complex assignment, which has parameters, characterizing its uniqueness. This process includes the aims, the results and the work on the project, the time for its performance, quality, price, allocated resources, risks and possible changes (Popov, Y., Yakovenko, O., 2007).

The sequence of consecutive projects, which constitute the basis for functioning of the construction undertakings, suggests a special form of organization of production and management. In this field of activity, we can talk about the project model of doing business

as an aggregate of interrelated projects. Such an approach enables adequate reflection of the specifics of modern business where the flexible behaviour in a changing environment is turning into a key strategic competitive advantage.

The project management system of a construction company should comply with the following basic requirements: focus on the support for decision making related mainly to the use of the available resources and the development of new products, markets and services, an effective system of human resource management, a flexible system of planning and accounting, a developed office system, monitoring and maintenance of the relations with customers and partners (Tsipes, G., Tovb, A., 2006).

The projects implemented within the activities of construction undertakings can be:

- Short-term – consisting of a range of measures, and when performed, the undertaking can immediately go on a next level (to the desired condition);
- Long-term – designed for the future and requiring the performance of several tasks (for example, entering new markets for sales or new consumer niches).

The project has been conceptualized through the strategic planning process of the organization and is documented into a Capital Improvement Plan (CIP). The major reasons to create projects are to deliver capital assets. The capital improvement plan consists of several planned projects, which, when performed will provide the assets necessary to accomplish the strategic goals. The project starts its lifecycle when it is authorized to pass from CIP to implementation.

The project performance is planned and controlled by the project manager. The project manager should have appropriate authorities to exercise the responsibility of forming and managing a team for support of the project. The project manager should have previous experience in the management of similar projects in the past. The project manager can be in charge of the management of a multitude of projects, which may require the employment of additional managers for support. In such cases, the project manager shall take the part of a program manager.

The manager of the construction projects is responsible for the planning, coordination, budgeting and supervision of the projects from beginning to end. In short, the manager of a construction project has to take care of the following:

- Drawing up the budget and negotiating cost evaluations;
- Drawing up and arrangement of the working schedules;
- Selection of the most efficient method and strategies for construction;
- Keeping in touch with the customers in relation to issues concerning the work or the budget;
- Discussing the technical and contractual specifics with the workers and other professional parties;

- Monitoring the personnel in the construction on the spot;
- Cooperating with the construction specialists. (Koutsogiannis, A., 2019)

In addition, the management of construction usually extends to a multitude of various functions. The most important of them can be summarized as follows:

- Specification of the project goals and the plans, including drawing up of scope, planning, budgeting, deciding the requirements for accomplishment and selection of participants in the project;
- Increasing the efficiency of resources through acquisition of workforce and the necessary equipment;
- Conducting several operations through legal coordination and management of the negotiation, planning, evaluation, design and construction during the entire procedure;
- Effective development of stable communication between agents for solving any eventual conflicts.

The projects are defined by their scope, budget and schedule. The schedule defines a specific beginning and end. Projects pass through a lifecycle of stages between their beginning and end, which in relation to the construction projects typically are: commencement, planning, design, building, commissioning and completion (Shadan & Fleming, 2012).

Scope: Each project is unique and has to have a written document with requirements, which takes into account the operational needs, the level of service, regulatory requirements and the quality of results. The scope develops where the new information becomes accessible throughout the lifecycle of the project. The improvement of the scope is a necessary process in the project lifecycle while the reduction of the scope is the result of lack of clarity as to the requirements in the initial scope concerning the needs, level of service and level of the results' quality.

Schedule: All projects should have a specific beginning and end. The Capital Improvement Plant (CIP) usually provides approximate dates of the project beginning and the end date when it should be in operation. After there is a well-defined scope, it is necessary to determine the time necessary to finish the project by developing the project schedule. The schedule development includes separation of the work into manageable activities needed for the accomplishment of the scope, evaluation of the duration of each activity and placing them in their logical sequence.

Budget: All projects are limited by the limited money resources for financing. Therefore, each project needs a budget in order to determine initially its requirement for financing. The budget usually provides the preliminary financing of the project, which is established through the CIP. The project manager develops the budget on the grounds of the forecasts for the costs at the beginning of each stage of the project and specifies it more

precisely after they have better information determining the scope. The budget precision takes place by research and analyses in the process of the project development during the preliminary engineering stage (Shadan & Fleming, 2012).

A project starts its lifecycle when it is authorised to pass from the capital improvement plan – CIP – to performance. For a conventional project for design /bidding/building (D/B/B), the project lifecycle starts with the start of planning (including environmental planning and financing) and designing (including the conceptual design). These stages overlap to an extent. During these stages, the project develops through a review of various alternatives and the concept of preferred alternative shapes. The stage of designing continues through preliminary engineering effort for further analysis, validation and defining the preferred alternative and reaching the basic scope, budget and schedule. After that the stage of designing finishes with the final design, which describes in detail the project characteristics to provide the construction organization for issuance of building permits and the contractor with a range of construction drawings and specifications for permission and building of the project. The construction stage continues with the process of the offer and award. At the end of the construction stage, the contractor's work should be integrated with the operations and provided activities, technologies and equipment and evaluated for acceptance during the stage of commissioning to bring the project to successful completion (Shadan & Fleming, 2012).

The purposes of project management are to implement the project so that the results can comply with the requirements for the scope as per budget and schedule and at acceptable levels of risk, quality, safety and security. The project goals compete with each other many times and require skilful balancing by the project manager throughout the entire lifecycle of the project.

In addition to the scope, budget and schedule, it is extremely important that the project manager should facilitate the discussion of the purposes of risk, quality and safety and security of the project and include the result in the Project Management Plan (PMP). Projects require well-defined management of the configuration, change control systems and procedures for the scope and control of changes.

The process of the project management begins with identification of the user requirements, the project limitations, the needs of resources and the establishment of realistic goals for accomplishment of strategic goals. The project approval by the management body will establish the permission of the project. The project manager uses the project permission to develop plans for the project management in view of its performance. The project manager should have previous experience (or should consult colleagues with previous experience) with the specific type of project in order to balance

the above-specified competitive goals in due time, to adequately plan the project. The lack of previous experience will increase the risks of failure to accomplish the project goals.

The project managers need comfortable instruments for project management in order to make sure the projects are efficiently entered into, completed on time and within the budget and comply with all project specifications.

The following main types of reports on the project progress can be used:

- Progress report – Regularly drawn up reports on the progress, which are presented to the senior management, financing or interested parties of the project. It includes a short description of the performance indicators of the work on the project, including key events, duration, costs, etc.;

- Report on the costs for the work performance (report on the efficiency of costs) – regularly drawn up the report including information on the status of costs and the actual time of individual work;

- Report on the project condition – report on the actual condition of the project and the deviations from basic indicators, including planned costs and deadlines;

- Exception Report – a document, which includes the main exceptions to the plan for the removal of which corrective actions will be needed;

- Project Log – chronological report on significant events occurred during the project implementation. The development of alternative scenarios provides an opportunity to simulate various circumstances, for example: what happens when the resources transfer from one site to another, with urgent completion of the project; when one more project is added to the projects being implemented in the organization, etc.

Upon clarifying the main problems related to the construction projects, it is especially important to bear in mind their classification as well. Several authors provide a formulation to the types of construction projects. E. Zagorodnova and O. Khvorostukhina classify the construction projects by various characteristics – by the type of construction (residential – civil, industrial, transport, agricultural, energetic construction); according to the results of the project; the financing sources; the scale of the project; the complexity of the project; the directions of activity of the construction organization (construction of new buildings and facilities as well as reconstruction, expansion or technical re-equipment of the sites, capital repair of buildings and facilities, current repair) (Zagorodnova & Khvorostukhina, 2015).

The classification of the construction projects of A. Pshinko, A. Radkevich and L. Dadiverina is the following:

- According to the financing source – projects financed at the expense of internal sources of natural persons or legal entities, shareholders' capital, with mixed form of financing;

➤ In view of the purposes of financing - the construction projects are such that ensure the growth of scope of the construction production directed to enhancing the assortment of production ensuring reduction of the base cost of production directed to the implementation of the social programs of undertakings (improvement of the conditions of work, living, solving of environmental tasks, etc.).

➤ By the scales and level of complexity – small projects, megaprojects, complex projects;

➤ According to the deadlines for implementation – short-term, middle-term and long-term (Pshinko, Radkevich & Dadiverina, 2017, p. 14-15).

The classification of A. Kalashnikov and N. Vatin is similar to the classifications so far reviewed:

- According to the tasks – social, scientific- research, technical, investment, etc.;
- According to the scale – small, medium, large, global, megaprojects;
- According to the deadlines – short-term, middle term, and long-term;
- By other characteristics – for example, defect-free, multi-projects, international, alternative (Kalashnikov & Vatin, 2011, p. 21).

Reviewing the investment projects related to the construction and real properties, the same authors subdivide the projects into the following types depending on the tasks solved:

- Development projects;
- Projects with mortgage financing ;
- Real estate activities, real estate business projects;
- Real estate management projects, etc. (Kalashnikov & Vatin, 2011, p. 24).

Construction works are built in a single production and on the construction site, which renders their standardization or automation difficult (Fotiadis, 1990). One of the most important characteristics of the construction industry is information communication. Thamhain and Wilemon state that successful communication between the working groups is the third most important factor for the success of a project (Pouria & Froese, 2001).

Each construction project produces multimedia data from the very beginning and is constantly developing during the stages of design, construction and after the project. A large portion of such data obtained at the early stages of the project is useful for the following projects (Yu, Froese & Grobler, 1999). In view of the fragmentary nature of the construction industry, the secure sharing of data and the effective management have been and still are areas causing major concern for decades on end. Each scientific area produces its own information and exchanges information independently with the remaining participants in the project. The software applications in support of design, analysis, production and operation of a construction project usually operate independently and encounter problems upon direct exchange of data even when used by the same group

(Bazjanac & Selkowitz, 1997). The information is entered again with new or different structures, it is lost or it erodes and at the same time, vital information is missed or is not optimally used. Therefore, the necessity of secure and effective information exchange on the grounds of standards within the organizational units is visible in order to accomplish considerable integration in the production processes and improve the communication between construction organizations.

The results of the project management of a construction undertaking can be an increase of profitability, increase of the market share and entering new markets, as well as opening up of new divisions of production and provision of services, development of new facilities, modernization of the existing facilities, as well as simply the occurrence of financial stability of the undertaking. The efficiency of results is evaluated by how much it corresponds to the costs (or profitability), innovative, quality, social, environmental or other characteristics at the planned level (Popov, Y., Yakovenko, O, 2007).

Upon making a decision to apply the methods of project management in the application of the concept of the construction undertaking it is necessary in each particular case to analyse the necessity, adequacy of such application because there is an opinion that for small projects in construction undertakings the use of special methods or special organization is not required (Tevlina, S., 2008). It is also necessary to determine whether it is possible to apply the methodology of project management both in the process of implementation of single projects and in the process of implementation of standard projects in the construction business.

In order to make decisions regarding the use of project management, it is necessary to make an assessment of whether the goal is labour-consuming, whether the tasks are multi-faceted and whether they need to be combined in a summarized system, whether there is a need for management of a multitude of resources. It should be clear whether the project requires the establishment of a strict budget, time, whether it is necessary to react fast to changes taking place during the project implementation. The project management methods should be applied if the performance of the assigned tasks requires the use of diverse knowledge and specialists, as well as upon solving problems in a competitive environment, in the cases where the deadline and time for their solving play a major part.

The use of methods for project management enables the customer to easily adapt to the changing environment. When a decision is taken to apply methods for project management, it is necessary to understand that depending on the scale of performed tasks it becomes necessary to use a different set of tools and methods for project management. Their use in projects in the construction sector will increase the efficiency of solving performance problems without serious material costs.

In the construction business projects of economic, production, organizational and technical nature are performed. The environment of a project performed in a construction undertaking is the undertaking itself most of all, the undertaking's management, the financial department, the commercial or business department, as well as other departments of the company.

Thus, we should discuss the fact that project management should be implemented as a valuable and useful managerial tool affecting both the issues of strategic management and the organizational structure of the company, and its financial structure and the system of budgeting, and the system of personnel management, as well as much more, including, naturally, information technologies. And that is impossible without the establishment of corporate norms and culture of management of projects and specifying them by way of a company standard (Tsipes, G., Tovb, A., 2006).

This idea has been most completely embedded in the concept of total project management of a construction company proposed by H. Tanaka (2006). This concept suggests optimization of all fields of the project performance of the company: formation of a balanced portfolio of agreements viable, profitable, contributing to the company growth), achieving high profitability, accomplishing high operative production and increasing of the capacity of subdivisions to minimize the risks due to structural control and regulation of the operations.

One of the important factors impeding the full-scale application of the project management methods in construction according to P. Morris is the fact that the actual activities of project management in construction typically encompass a wider subject area compared to the traditional model, PMBOK®Guide, namely management of strategic, technical and commercial issues (Morris, 2005).

So, there is a marked difference between the methodology and practice of the management of construction projects.

Conclusion

The management of construction projects is a complex activity requiring the consideration of many factors of uncertainty, as well as the establishment of correct organization of the work for the project implementation. The research results indicate that knowing the specifics of the project organization will enable entrepreneurs to effectively manage the construction projects. Moreover, in view of the fact that the construction projects become ever complex for management, it is necessary to have flexibility in the organization and agreements in order to react to inevitable changes. For successful and effective construction, it is necessary to establish an integrated project organization uniting

the commercial interests of the parties around the interests of the project as a whole. For that purpose, it is necessary to use modern tools and methods for project management. It is recommended to use tools in order to optimize the entire process by removing everything unnecessary and giving added value to the customer.

REFERENCES

- Bazjanac, V., Selkowitz, S. (1997). "The International Alliance for Interoperability: Its Mission and Its Method", LBNL, August 1997.
- Fotiadis, G. (1990). *Organization and management of construction sites*, University Notes, AUTH., Polytechnic School - Department of Civil Engineering, Department of Transportation and Organization, Thessaloniki.
- Kalashnikov, A., Vatin, N. (2011). *Organization, management and planning in construction. Basic principles and foundations of the organization of investment and construction projects*, St. Petersburg State Polytechnic University, p. 21, 24.
- Koutsogiannis, A. (2019) Construction project management processes: Everything you need to know, <https://www.letsbuild.com/blog/construction-project-management-processes>
- Morris, P. (2005). The irrelevance of project management as a professional discipline. *Project Management*. 3 (3).
- Popov, Y., Yakovenko, O. (2007). Project management. M.: INFRA-M.
- Pouria, A., Froese T. (2001) Transaction and implementation standards in AEC/FM industry, Proceedings of 2001 Conference of the Canadian Society for Civil Engineers, Victoria, BC, May 30 – Jun 2, 2001, Paper C43.
- Pshinko, A., Radkevich, A., Dadiverina, L. (2017). *Construction project management*, Dnepropetr. nat. un-t railway transport them. acad. V. Lazaryan, DNEPR, p. 14-15. ISBN 978-966-8471-75-9
<http://eadnurt.diit.edu.ua/jspui/bitstream/123456789/10014/1/Pshinko%2C%20Aleksandr%20N.pdf>
- Sakarev, I. (1997). *Organization and management of construction*, UASG' Publishing Center, S., p. 7
- Shadan, K., Fleming, G. (2012). *Construction project management handbook*, Washington, FTA Research.
- Sprude, A. (2012). Construction project management. Trends and nuances of our time, *StroyPROFI* 5, <http://stroy-profi.info/archive/11084>

- Tanaka, H. (2006). Integrated project management in contracting organizations. *Project and program management. 1 (5)*.
- Tevlina, S. (2008). Features of project management in construction companies. Innovations and investments, *Scientific and technical bulletin of SPbSPU 2 '2008. Economic sciences*.
- Tishtenko, L. (2012). Managing Problems in construction projects, Available at: <http://elib.sfu-kras.ru/handle/2311/7767>
- Tsipes, G., Tovb, A. (2006). *Project management in the practice of a modern company*. M.: CJSC "Olymp Business".
- Yu, K., Froese, T., Grobler, F. (1999). A development framework for data models for computer-integrated facilities management. *Published in Automation in construction, special issue on facilities*
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.9.1877&rep=rep1&type=pdf>
- Zagorodnova, E., Khvorostukhina, O. (2015). Project management maturity evaluation in regulating its processes in construction companies, http://ars-administrandi.com/article/2015_3_76-90.pdf