1. PROJECTS AND PROJECT MANAGEMENT. BASIC CONCEPTS

Project management is a dynamically developing direction of modern management. It organically combines managerial, psychological, financial, mathematical and informational aspects.

Like many activities, project activities are regulated by certain norms and rules. There are a number of national and international standards in this area, which, however, are not mandatory. Among the main standards we would like to mention the following (all these standards can be found on the Russian Federal information portal on standardization http://standard.gost.ru/wps/portal/):

* GOST R 54869-2011. Project management. Requirements for project management;
* GOST R 54871-2011. Project management. Requirements for program management;
* GOST P 56714.1-2015. Multi-project management. Project, project portfolio, program management. Part 1. Basic provisions;
* GOST R MEC 62198-2015. Project management. Guidelines for the application of risk management in design;
* **GOST R ISO 21500-2014. Guidelines for project management;**
* **GOST R ISO 21504-2016. Project, program and project portfolio management. Guidelines for project portfolio management.**

Note that the last two of the above standards are maximally unified with the corresponding international standards of the **ISO system**.

Standard GOST R 54869-2011 "Project Management. Requirements for project management" (https://docs.cntd.ru/document/1200089604) gives quite clear definitions of the main concepts in this area.

Definition 1.1. A project is a set of interrelated activities aimed at creating a *unique* product or service *under* time and resource *constraint*s.

Such a definition is generally recognized. For example, the German project management standard DIN 69901 states that a project is an undertaking (intention) that is largely characterized by the uniqueness of conditions in their totality, for example:

goal (objects) setting;
time, financial, human and other constraints;
of differentiation from other intentions;
project-specific organization of its implementation.

There are two main features of any project that need to be noted:

1) the project always creates something new (*uniqueness requirement*);
2) the project leads to a demanded result (*demand requirement*).

Thus, the routine daily work of producing, say, a serial model of a car on the assembly line is not a project. Launching the production of a new model, on the other hand, can be considered a project. When we talk about a project, what we really mean is the solution of some actual problem.

Let us return to the Russian Federal standard just quoted. The following two definitions are taken from it.

Definition 1.2. A project product is a measurable result to be achieved during project implementation.

Definition 1.3. Project management is the planning, organization, and control of the project's labor, financial, and material and technical resources to effectively achieve the project's objectives.

Project management processes perform activities related to the following functional areas of project management:
1) project content management;
2) project time management;
3) cost management in the project;
4) project risk management;
5) project personnel management;
6) project stakeholder management;
7) project delivery management;
8) quality management in the project;
9) management of information exchange in the project;
10) project integration management.

The sequence of project management processes is determined by the context of a particular project, with:
project should begin with the project initiation process;
the project should end with a project completion process;
the execution of the processes of organizing the execution and control of the project does not start before the planning processes.

The role (organizational) structure of project management can vary greatly depending on the specifics, but the following roles should be defined in every project:
* *project customer:* a natural or legal person who is the owner of the project result;
* *project manager:* a person who manages the project and is responsible for the project results;
* *project supervisor:* a person responsible for providing the project with resources and providing administrative, financial and other support to the project;
* *project team:* a set of individuals, groups and organizations united in a temporary organizational structure to perform project activities.

The following figure illustrates the basic concepts of project management and their interrelationship.

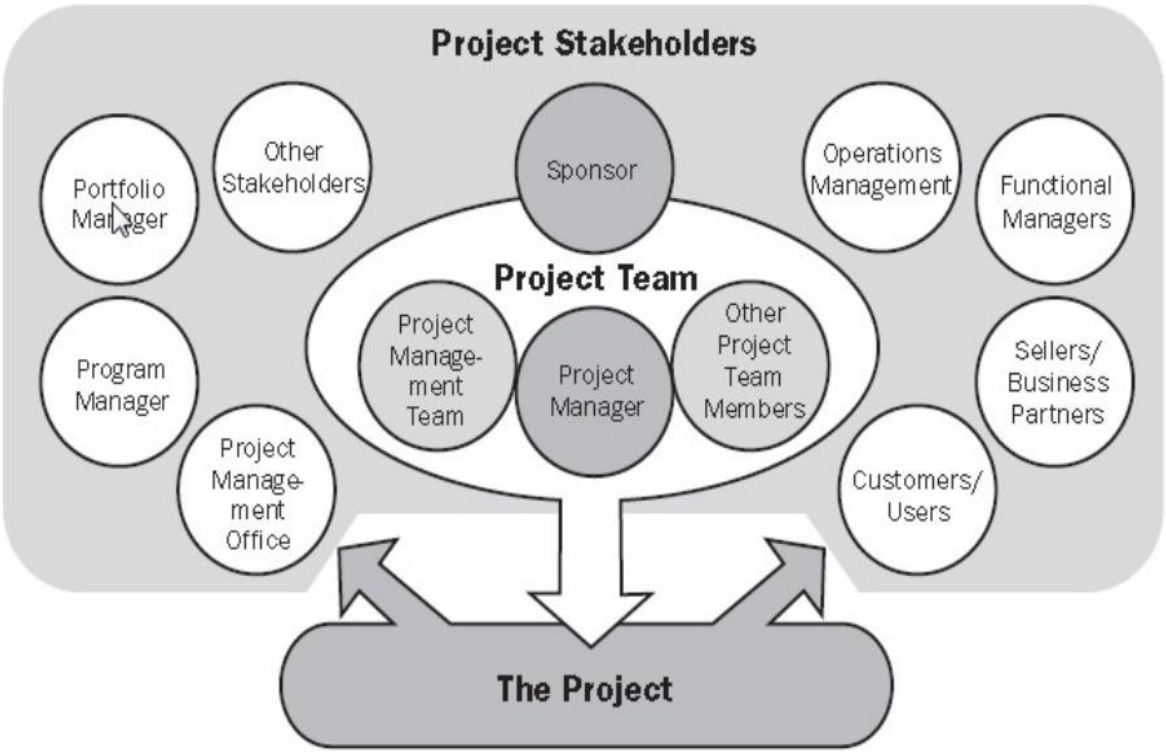

Fig. 1.1. Basic concepts of project management

Note that in each of the 10 above-mentioned functional areas there is a mass of absolutely heterogeneous tasks. Some of them can be solved by purely mathematical methods. Some of them (team building, teamwork, leadership, conflict resolution, etc.) require serious knowledge of psychology. Budgeting and financial activities are impossible without accounting and management. Modern projects require the use of specialized software: from mathematical packages and accounting programs to

communication tools, including tools for remote team work. The following figure gives a general idea of the main aspects of project management.

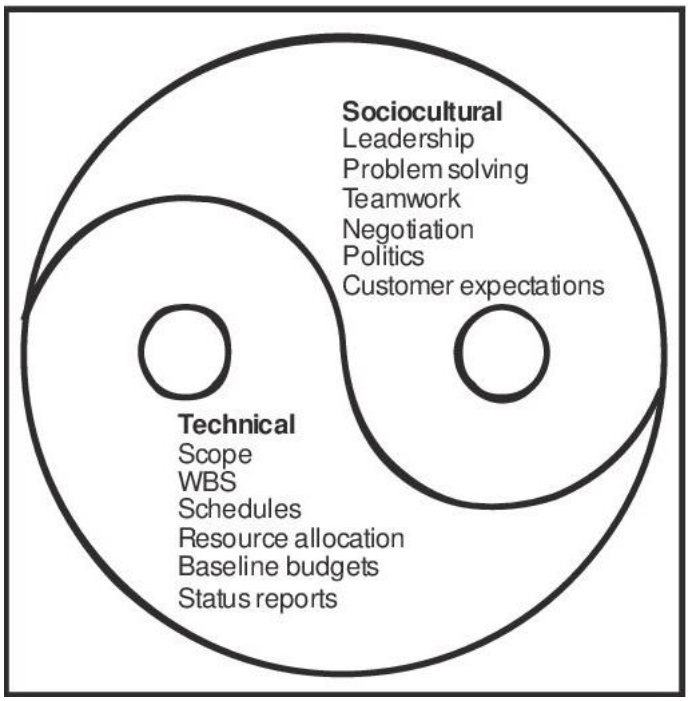

Fig. 1.2 Aspects of project management

Naturally, any project has a purpose or purposes.

Definition 1.4. Project objectives are the desired results of activities to be achieved when the project is implemented under given conditions.

Achievement of the project objectives is characterized by three main indicators:

- quality;
- time;
- costs (expenses).

The following three levels of goals are usually distinguished:

1) the general purpose of the project (mission);
2) the necessary project objectives;
3) the desired goals of the project.

Figure 1.3 illustrates the so-called project pyramid (from idea to implementation strategy).

Figure 1.3. Project pyramid

Definition 1.5. The project structure is the main parts (elements) of the project that are necessary and sufficient for project implementation.

Finally, it should be noted that any project emerges and is realized in a certain environment. In addition to the project's internal environment, the project's near environment (direct contacts and direct influence) and far environment are usually distinguished (Figure 1.4).

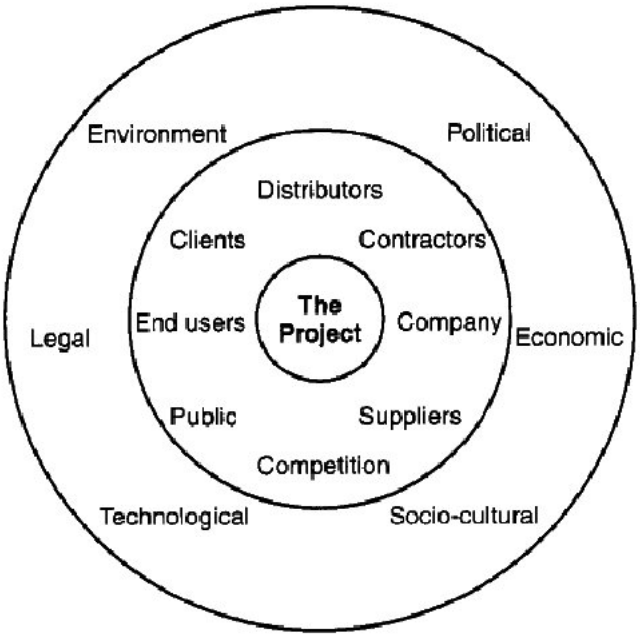

Figure 1.4. Project environment

Classification of projects is done on various grounds.

I. Classification of projects by outcome.

Outcomes can be planned and unplanned (spin-offs, personal outcomes of participants).

According to the type of results, the following are distinguished.

1. *Actual (product) result*:
   * new knowledge;
   * new device, apparatus or prototype;
   * new artistic (musical, etc.) objects;
   * complex results (technologies, innovations).

2. *Educational outcome*:
   * getting into the context of the profession;
   * applied skills and competencies;
   * ways of organizing work in the project;
   * values, etc.

Product outcomes usually *do not occur until the end* of the work. Educational outcomes *can occur at any stage* of the project.

II. Classification of projects by type.

Typically variants are the following:

- professional projects that are completed by professionals during their working hours;
- training projects carried out mainly in educational institutions.

Professional projects in turn include research, engineering, technology, entrepreneurship, innovation, infrastructure and art projects.