Management elements of conception and development of scientific research projects

A Ioana, M Costoiu, D Tufeanu, A Semenescu and D Marcu
Politehnica University of Bucharest, Spl. Independentei 313, Bucharest, Romania

E-mail: adyioana@gmail.com

Abstract. The concept of a scientific research project offer must be based on the analysis of the four types of resources: the human resources, the financial resources, the material resources and the informational resources. We note the importance of the human resource quality. In the following figure we present the main elements of the design algorithm of a research project. The feasibility study (otherwise very complex) is of great importance for the success and viability of the project. We have developed the algorithm for designing a scientific research project. Thus, we have devised several items, in a non-fortuitous order: formulation of the theme, resources analysis, feasibility study, offer formulation, project drawing, project implementation, project evaluation, dissemination. We have critically analyzed several definitions of a scientific research project. For example, "a set of investments and other planned activities to achieve specific objectives within a predetermined time frame and budget", or, "a planned action that is a set of interrelated and coordinated activities to achieve specific objectives within a given budget and a period of determined time". We also analyze the key functions of a scientific research project: specifying the issue to be addressed, specifying the objectives to be achieved, specifying the activities to be undertaken to achieve the objectives, specifying the revenue (or resources) needed for the deployment activities, identifying and specifying the responsibilities of the different organizations involved in implementation of the project, allowing technical and administrative reviews of the project, the basis for monitoring and evaluating the project that can be done either during the project’s implementation, or after the project has been completed. We have formulated in the article specific concepts on: "a development program is sustainable when it is able to provide an appropriate level of benefits over a longer period of time after the financial, managerial and technical assistance from the external donor ended", or, "for most projects sustainability is a default, and donors and recipients wait and take responsibility that certain aspects of the activity will continue. Failure to make explicit sustainability as part of the project's training and implementation process may lead to lack of benefit".

1. Introduction
There are several definitions of the term "project". A project can be defined as "a set of investments and other activities planned to achieve specific objectives within a predetermined time frame and budget", or as: a planned action that is a set of interrelated and coordinated activities designed to achieve specific objectives having a given budget and a determined period of time ".

Taking into account the above definitions, it is obvious that there are the following common elements [1, 2]:
- objectives;
- activities;
• planning;
• defined program;
• budget.

The project’s documentation has the following key functions:
• specifying the issue to be addressed;
• specifying the objectives to be achieved;
• specifying the activities to be undertaken to achieve the objectives;
• specifying the revenue (or resources) needed to carry out the activities;
• identifying and specifying the responsibilities of the various organizations involved in the implementation of the project;
• allowing for technical and administrative reviews of the project;
• the basis for the project monitoring and evaluation that can be done either during the implementation of the project or after the project has been completed.

Obviously, a well-prepared and well-presented documentation of the project does not guarantee the success of the project itself. Experience shows, however, that in order to have sustained long-term results, particular attention should be paid to the identification and formulation of the project [3,4].

2. Establishing the work methods and tools used in the project

The acceptance of the method is that of the working technique used in the field of project management, and the tools aim at implementing the methods. With regard to methods and tools, it is necessary to adopt an appropriate strategy for their use so as to achieve the following objectives

- Scalability, which will mean the possibility of applying a method or of using a tool for any project, regardless of its size, but also for single or multiple projects;
- Collaboration, in the sense of facilitating work in large teams or of the possibility for more people to work on the same project or multiple projects at the same time;
- Modernism, by the fact that the preoccupations for acquiring the newest methods and working tools will be stimulated;
- Measurability refers to the possibility of quantifying and evaluating the efficiency of using the methods and tools;
- Dissemination of the project results will aim to improve project management over time by gaining knowledge from previous experiences.

In figure 1 we present the main stages (which constitute, implicitly, methods and instruments) of conception, realization and implementation of a scientific research project.

The four types of resources needed to conceive, develop and implement a scientific research project are the following (in a non-fortuitous order): the human resources (the most important), the financial resources, the material resources and the information resources (the ones that governs the first 3). In figure 2 we present the types of resources and the correlations between them.

The importance of the human resources lies in the complementarily and professional competence of its members. A competent professional team ensures 75% of the project's success. Many find it totally wrong that the financial resources are the most important. The mistake lies in the fact that financial resources, no matter how "rich" they are, if spent inefficiently they are as if non-existent. The information resources, which govern the other 3, are also of overwhelming importance. It should be kept in mind that all the information be correct. Here the professional competence of the human resources plays a key role.
3. Possibilities for verification and validation of the project’s objectives
The use of the indicators for the objective verification of the project stage is a way of quantifying the achievements or success of the project.

An indicator can be defined as "an accessible and trustworthy correlative if a dimension of the interest, whose correlative is used as the measure of that dimension, because the direct measurement of that dimension is not possible or practical" [5].
Such indicators "provide the only measures available, and our understanding of the social life depends largely on the use and research of such surrogates for dimensions whose variance we are trying to understand" [5].

In other words, "the indicators are used to provide a standard for measuring, evaluating and indicating the progress of an activity in line with the proposed targets, for resource allocation (resource indicators), producing outputs (output indicators) and achieving objectives (the effect and impact indicators) " [5].

The main activity to be carried out here is the identification and formulation of the indicators which, for all the levels of the project strategy, will help determine the level at which a particular element, whether objective, result or activity, has been dealt with. At this stage, it is essential that the various parties involved in the project fall beforehand to an understanding on the indicators to be used, and on what these indicators will measure.

Concerning these different indicators, the following observations can be made:

- The indicators should define the content of the project’s elements (goals, results, etc.). In a logical framework, the indicators are clearly of a different quality for the different levels that have been set. In general, it will be easier to find indicators to measure whether the activities have been well-run or whether the results have been achieved than to formulate indicators to show whether the project’s objective or overall objective has been achieved.

- The objectives, activities and results, together with the indicators, must answer questions about quality, quantity, time and space. It is therefore advisable to quantify responses, even if they relate to quality. On the other hand, rather than trying to reduce complex concepts to a small set of numbers, "the description of the project can be prepared with indications in the case of a change".

4. Steps of the management activity analysis applicable to scientific research projects

The content of the economic activity analysis and combining this content with synthesis can be outlined in the following stages:

- The delimitation analysis object which implies considering several facts, phenomena and results. This step depends on the purpose and on the objective to which the analysis is being subordinated. Frequently, the results are recorded as the compliance of the current indicators with the targeted indicators.

- The determination of the elements, factors and causes of the phenomenon being studied. The decomposition in elements implies a structural analysis. The factors are monitored successively from those with direct action to those with an indirect action and so on, until establishing the primarily causes. In others words, the knowledge process deepens from less profound issues to more profound ones.

- Establishing the determinants factors implies both the correlation between each factor and the phenomenon, as well as the correlation between various factors. It is necessary to determine the cause and effect relationship.

- Measuring the influences of various elements or factors. In this stage, the quantitative analysis plays an important role, for the quantifying influences, measuring internal resources and evaluating as accurately as possible the results.

- Summarizing the analysis results, issuing the conclusions and estimates.

- Issuing the set of measures which comprises the decisions meant to provide an optimum employment of resources and contribute towards increasing the future efficiency of the economic activity.

Carrying on through these stages provides the complete ad scientific basis of the analysis. The whole analysis process is represented as a diagram in figure 3.
5. Conclusions

The scientific management specific to scientific research projects is a very important area. The concept and realization of a project offer with the correct application of the management concepts ensures the success of the project.

Among the many stages of scientific research projects management, an important role is played by the right choosing of the four types of resources (human resources, financial resources, material resources and information resources. Among these resources, besides the information resources, which govern the other 3, a primordial role is taken by the human resource. Starting from the dictum "the man sanctifies the place," we could paraphrase "the man sanctifies the project."

Also, the other items of the management of a scientific research project are important, such as the pre-feasibility and feasibility study (not at all easy to deal with), the correct management and use of financial and material resources, the scientific periodical evaluation of the project’s status and results, as well as the simulation and validation of project’s results.

A scientific research project should not end with its completion and implementation but should continue with the regular verification of the effectiveness of its results in use. The satisfaction of the project's beneficiaries is the first and also the most important step towards the success of a new project.
6. References

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