

## THE CONTROL OF INVESTMENT PROJECTS: TYPES OF CONTROL, THE STAGES OF THE PROCESS, CONTROL SYSTEMS

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**Abstract:**

*The execution of any investment project is under the pressure of two factors: time and cost. For managers, but also for the other factors involved in the project, respecting the periods for execution and the consumption of resources: human, material, financial, technical etc. is a permanent preoccupation during execution. But for this they need adequate tools and techniques, both for the correct dimensions of the time and resource parameters and for later monitoring and control on site.*

*In these circumstances, a problem that project management faces is finding those methods that would allow dimensioning and controlling the balance between expenses and incomes.*

**Keywords:** investment projects, risks, control system, strategic control, tactical control, operational control.

Thus, while financial control helps in monitoring important aspects of the performance of an investment project, its sub-projects and components, budgetary control offers the quantitative tools of monitoring the superimposition of performed incomes and expenses with the planned ones. The control of quality offers means of evaluation for the quality of products and services, with the purpose of increasing the project's competitiveness. The control of each stage of executing the project offers the possibility of checking the availability of entries for the next stage, in the situation of minimal costs.

The types of control used differ according to their degree of use on different levels of accomplishing the investment project. Thus, financial control is mainly used on a hierarchically upper level, as it especially focuses on the financial aspects of the project. Monitoring the financial aspects which affect the activity on the medium and lower levels is primarily done with the help of budgetary control, as this type of control allows the analysis of activities from the perspective of allotted budgets.

The issues previously presented emphasize a different stress on coordination, which refers to the way in which control is applied before, during or after the process of accomplishing a stage or phase of the investment project. Financial control represents a post-activity control mechanism, because the information is generally evaluated at the end of the reporting periods. But exerting control at the end of the project may result in the impossibility of making any changes that would modify a certain situation in a phase or sub-phase of the project. On the contrary, budgetary control can be used to adjust the ongoing activity, which would lead to attaining the objectives regarding the budget level, considering the fact that information is useful in planning some changes that may affect the future performance and results of the project. If the budgets are analysed only at the end of certain periods, budgetary control is close to post-activity control.

With reference to the control system of investment projects, I consider it is necessary to follow these stages:

✚ ***the establishment of stages and operations that must be controlled***: before the beginning of the process of control, there must be a decision on the most important operations, processes, stages of the project to be controlled, a necessary option because the control of each aspect in the activity of the project is virtually impossible to do, and the employees hate the idea of being controlled at every step. It is necessary to base control on the objectives of the investment project, on the ongoing activities and the process of planning.

✚ ***the establishment of standards***: in the process of control, standards play a special part because they provide the specific criteria of evaluating the employees' performance and attitude. Although such standards are included in the objectives settled in the phase of devising the project, for the necessity of change to be relatively low, during the application of control there is a

possibility that these standards be revised. Generally, standards serve some important purposes related to the attitude of the human factor involved in the project. Thus, first of all, standards offer the employees the possibility of estimating the results of their work and of knowing the way in which they will be evaluated, a fact that allows them to perform their work efficiently. Secondly, standards offer a starting basis in detecting the difficulties of the post, regarding the personal limitations of the project's members. These limitations may be based on lack of ability, expertise or experience, or other types of deficiencies related to the work performed, which prevent employees from performing their tasks properly. The detection of these deficiencies on time allows the application of corrections before the difficulties become serious or even unsolvable. Eventually, standards help in reducing the possible negative effects of the incompatibility of objectives, which signal the situation in which there are important disagreements between the individual objectives of the employees and those of the project.

✚ ***the measurement of performance*** constitutes the next step after establishing the ***standards***: for a fixed standard, there must be a decision on how performance must be evaluated and how often this is facilitated. The means of evaluating performance depend on the established standards. Once the means selected, there must be decided the frequency of evaluating the performance through control. In some cases, data is necessary daily or even more often, even though the specific of investment projects is monthly, quarterly, half-yearly or even annual reporting. The period of evaluation generally depends on the importance of the respective objective for the project, on the likelihood of a sudden change of situation, on the difficulty of correcting a problem that may appear and on its cost.

✚ ***comparing performance with standards*** consists in comparing performance, evaluated in the third phase, with the standards established in the second phase. This comparison is often based on the information provided by reports emphasizing the planned level and the results, respectively. Such reports could be presented orally, in writing or automatically provided by different special soft. Through computer networks there can be obtained every minute reports regarding different quantitative evaluations of performance.

✚ ***acknowledgement of performance***. When performance reaches or surpasses established standards, there should be known the positive results obtained, both in non-verbal language and in offering substantial rewards in the form of bonuses, training opportunities or pay rises, in the case of a special result or of appropriate accomplishment of work tasks. This approach is compatible with the theories of motivation, such as the theory of expectancies and the theory of support, which stress on the importance of rewarding performance to support and encourage these results as much as possible.

✚ ***taking necessary measures to correct the errors***. When standards are not respected, there must be a thorough analysis of the causes and quick correction. During this evaluation, there is usually a verification of the standards and of appropriate results to check if they are realistic. It can often be concluded that sometimes standards are inadequate, generally because of the changes in the conditions of executing the activity, and that corrective actions are paramount for the purpose of attaining the established standards.

✚ ***adjusting the standards according to necessities*** is imposed by the fact that standards must be checked periodically to ensure that their association with the evaluation of performance is relevant for the future. The existing standards and the evaluation of performance may be inappropriate, on one hand because they were incompatible from the beginning or, on the other hand, because there were changes in the conditions of performing the activity. In the same sense, surpassing standards may signal the existence of unsuspected opportunities, even if standards were attained. In such cases there must be a change in conditions, an improvement of the employees' level of training, with the possibility of rising standards in future stages and phases.

There may also be situations in which attaining a standard consumes too many resources, and there is made a decision of lowering it, using control to accomplish different activities in the project on time and within corresponding parameters, but there must be consideration for the fact that it is necessary an analysis of the process itself, to make sure it corresponds to the current needs.

Well-formulated objectives, strategic plans and sustained purposes offer an image of what is important for an investment project, so that we can obtain the expected results of the project.

In making the decisions on what must be controlled, there must be considered the reliability on resources of the specific field, which implies an approach of control especially in areas in which the accomplishment of the activity depends on others. In this context, resources include information, services, funds or any other type of resources that are necessary to attain the objectives.

As a conclusion, we may classify the control systems of projects into two large categories: *the extrinsic and the intrinsic system*.

*The extrinsic system* implies exerting control by specialized organs from the outside, entrusted by law to exert control on investment projects. The objectives of these activities are in most cases of a juridical or financial nature.

At the same time, extrinsic control is done internally too within the management process of the investment project through a series of mechanisms specific to any organization. Into this category fall the control processes of entries, exits and processes adjacent to the project. Although internal, this control appears as extrinsic in relation with the employees.

As a specific trait of this extrinsic system there is **preventative control**, which represents an antefactum process focused on the analysis of entries. It consists in the examination of information in the external medium and of the quality of the entries of resources in the system, their comparison with the established standards and the proceedings to actions upon entries that would ensure the prevention of eventually inappropriate results.

Preventative control is performed both on the objectives proposed and on the modalities to accomplish them, so as to minimize the possible human errors. Preventative control is closely related to the management of risk, in the sense of evaluating probable risks and their negative consequences. In other words, through preventative control there is an attempt at exerting control on the uncontrollable.

Also, still in the extrinsic system, there is **corrective control**, which focuses on the analysis of exits, namely of products or services. It is postfactum control, consisting in the measurement of actual performance of the process of production and of exits, comparing them with the established standards and triggering corrective actions upon all the elements of the system, to ensure the anticipated performance.

In this context there are also activities of control with an economic character and a juridical character.

**Diagnostic control** focuses on the components of the project and its analysis by considering different prisms of performance.

**Control through budget** focuses on the analysis of economic values that synthetically describe the process of the project and its performance. Budgets, as value expressions of the plans elaborated by managers, contain the objectives established to be attained and the financial values associated to different stages of execution. Control through budget represents an important aspect of the process of budgeting and allows the comparison between the results obtained and the ones expected, the establishment and reporting of deviations, with the purpose of keeping expenses between the established limits.

In these circumstances, a problem that project management faces is finding those methods that would allow dimensioning and controlling the balance between expenses and incomes. Since budgeting represents a systematic economic practice which implies a formal process of allotting financial resources, with the purpose of attaining some objectives established for the next periods, budget can become an instrument of correlation and especially of improving the connection between the expenses and the incomes related to the project.

Budget is, in the current view, a financial plan through which there can be foreseen in financial form the shares of the financial whole which are adjacent to attaining an objective by a certain organizational subdivision, complying several functions:

- + it presents the foreseen values of incomes, expenses and future profits, so they can be used as real financial standards;
- + it represents a useful tool in planning because it expresses the future objectives and analyses the ways of attaining these objectives;
- + it reflects the limited character of the resources owned by an organization and establishes the limits that must be considered when allotting resources to the organization;
- + it represents a useful tool for managers in the process of evaluating the financial performance of the company.

Budget can be elaborated by the top management of the organization and transmitted to be applied to its lower levels or may be elaborated by the managers on lower levels and transmitted for approval to the top management.

For investment projects, characterized by various activities, adapting budgeting to this situation is done by establishing flexible budgets, elaborated on different levels, considering the following characteristics:

- + planning and coordinating, it implies elaboration not only of the main budget, but also of secondary budgets. This makes managers consider the connection between the functions of budgets and the diverse departments in the formal structure of projects for which they are meant, and analyse the way in which these departments contribute to attaining the objectives established through budgets;
- + authority and responsibility, meaning authority for all plans of activity and allows management application in exception, that is an employee is given a well-defined role, with the authority of accomplishing the given tasks. When their activity does not take place according to budget planning, the situation is reported and analysed on a higher hierarchical level;
- + communication, representing a way of establishing relations between the upper level management of the project and the one on lower levels, for the purpose of applying the objectives. Another side of communication is represented by reporting approved plans which can be found in the overall budget;
- + motivation, a mobilizing factor for the involvement of the manager on the medium and lower levels in attaining the objectives that will be compared with the performance.

Budgeting allows the presentation of all provisions on the activity of the project and decentralizing management through dividing activities on centres of responsibility invested with authority and responsible for the administration of resources with the purpose of attaining the foreseen objectives.

**The intrinsic system** is represented by self-control on the level of each employee, based on the value system of the organizational culture and on workplace education focused on professionalism and professional ethics. Intrinsic control is done by psychological mechanisms on the level of each employee of the institution, being the most efficient control system, but also the most difficult to exert.

Control processes of a project must not be started only when errors occur and they must be corrected. From a short analysis there can be deduced which points in the project are to be controlled, what is to be controlled, how measurements are to be made, what the level of accepted errors is compared with the plan, how we will intervene and the likelihood of avoiding possible deviations.

**Control through limits** is exerted upon each employee by the establishment of some behavioural limits. This type of control starts from the idea that when an employee behaved according to the requirements of his position in the organization, without crossing the limits in decision-making and ethical competences, he will successfully accomplish the work task given. In this case control becomes **self-control**, each employee being interested in the successful accomplishment of the company's objectives. These limits are established as principles or behavioural rules, which appear in the set of internal regulations.

**Control through values** is similar to the previous one, but the stress is not on establishing behavioural and action limits, but on the development of a set of fundamental values regarding life

and work in the company. This is part of the evolution of an organizational culture which is stimulating and responsible, and ensures motivation in all employees to accomplish the mission of the project. The effectiveness of this control depends on the degree of culture and education of each employee, as well as on the efficiency in developing an organizational culture that includes fundamental values, reflects professionalism, performance, quality, innovation of the team spirit, fairness, trust and self-confidence, respect for value, time, people and their opinions. The implementation of total quality management is a superior form of developing control through values on an overall level.

**Cyber control** (also known as control of reactions), although by far the best known control system, is the least used in investment projects because its components and results actually represent compulsory elements to include in the next stages or to revise the stages performed in accomplishing the project. The basic idea of cyber control is that entries are turned into exits which are entries for the next stage of the project.

The differences between the real result and the standards are transmitted to a decision-maker, who will decide if they need correction or not, if any. If the differences are significant enough to need corrections, a signal is transmitted to the executor, who will intervene on the process or the entries so that the process creates exits closer to the established standards.

Cyber controls can be organized differently according to how sophisticated the standards are, as follows:

- + *first-order control*, which implies establishing the standard and adopting a mechanism to monitor the objective, without any changes brought to this, except for external interventions;
- + *second-order control*, also named a learning system, which implies a mechanism of changing the standards, being programmed to identify models and react to them;
- + *third-order control*, which considers the fact that objectives may change without any specific reprogramming, with the possibility of rethinking performance and making decisions when identifying unknown or unmentioned actions.

**Go/No-go control** can be used especially in evaluating projects, mainly from an economic perspective. The project planning, its budget and calendar represent documents of control on which it can be exerted on any level of detailing that can be supported by them. Although this type of control operates regularly, periodically, on intervals pre-established on the basis of a calendar, there should be considered the fact that the control points of the project do not appear as ordered periodic intervals. This requires a revision of the markers at certain intervals to keep up with all the aspects of the project, directly or through the participants on the lower levels. That is why there must be created a system of early warning so that possible problems could be identified and solved before they turn into hazards and disasters. A way of building such a system is the use of a prognosis table in which the outputs and the progresses are timed for different periods, they creating a basis for comparison with exits and prognoses corresponding to each period. (3).

In the opinion of the PhD candidate, this control system is the best to use in controlling investment projects, because it has a positive effect on the project team by the fact that the main concern is the quality of the project overall, which is mainly provided by the team's performance and not by aspects of individual work.

**Post-control**, also named post-performance, post-process or post-project control, is applied after the project is finalized. It does not represent an attempt at correcting what already happened and is actually an acknowledgement of George Santayana's observation, saying that "*Those who forget the past are doomed to repeat it.*"

While cyber control and go/no-go control are concerned with accomplishing the objectives of an ongoing project, post-control is concerned with accomplishing the objectives of future projects and is applied through a relatively formal document.

Planning control on investment projects from the perspective of performance, cost and time derives from different causes, factors that may later become hazards in failing to accomplish projects, including fundamental objectives in view.

The function of control implies the implementation of certain methods that must address the following problems:

- correct quantification of the connection between real and planned results;
- the identification of means through which the comparison could be made between these results;
- establishing recommended collective action and the person authorized to do it.

In the opinion of the PhD candidate, control of investment projects considers the following methods of control:

✚ *pre-control methods*, offering the possibility that results in the near future coincide with the planned ones. The different policies, as long as they define future actions too, represent important pre-control methods which involve human, material and financial resources;

✚ *concurrent methods*, consisting in supervising the employees' work. The use of the authority of function to exert concurrent control has become - in time - more and more difficult, due to the rapid changes of markets and technologies, which led to an increase in the importance of the influence of project managers to the employees to the damage of authority in itself. Operational decisions based on methods of concurrent control determine how many products are made and when. These decisions are named operative production programmes, or usually models in a net are used, or models of linear programming.

In the second category there are the models that help in determining foreseen values of variables that affect the results. The project manager may exert a certain control upon these variables, named linear control, because the mathematical equations used in describing these special systems are linear in shape.

In the category of concurrent methods there are also methods of financial control that allow managers to allot and evaluate the use of financial resources necessary for a product. At the same time, they provide project managers with acceptable, solvable cash and standards of profitability. This way there are created budgets that allot funds for each major category of expenses, and planning and budgeting are ineffective unless supported by policies and procedures that define the transactions to be done.

Concurrent control of the financial resources is mainly implemented through internal control.

✚ *post-control methods* use past results as a basis for coercion in future actions. These methods focus on: the analysis of the employees' performance, quality control, the analysis of standard costs and the evaluation of employees' performance.

As a control technique in general, control comparison can be used within control in investment projects, through which it is established the legal basis and the effectiveness of economic and financial operations and activities, in the examination of documents and synoptic tables, of recording in the technical-operative and accountancy balance.

Within control of investment projects there can be successfully used the method of comparing technical consumption of materials, raw materials and semi-manufactured goods with the ones recorded in the accountancy balance on the basis of devised documents.

To make a comparison it is necessary that the accountancy balance is kept properly so it would ensure that all parties involved accomplish their pre-established tasks.

Accountancy must accurately present all the aspects of a project, all the entries and exits of resources involved in the project, and the detailed costs of the project. At the same time, the accountancy of the project must include details referring to the project manager, to the person who made the estimates, to the supplier, the contractor and of course the client, namely the ultimate users of the project.

In the accountancy of the investment project there must be found analytically the recording of data according to economic paperwork, the objective of investment, on specifications of works (for example the specification on investment objectives) or on the basis of the overall specifications of the investment (the balance of expenses to obtain and preparation of the area, expenses on the infrastructure of the objective, expenses on planning and technical assistance, expenses on the primary investment, on exploitation and other expenses).

All methods of control (pre-control, concurrent and post-control) must not be regarded separately, but they must be joined within an integrative control system that ensures standards, information and corrective actions on every step from entering the system to exiting it.

We are of the **opinion** that, irrespective of the level on which it is exerted and of the pursued objectives, the system of financial control of investment projects includes three distinct moments, between which there are connections:

- a comparison between the situation on paper and the real one is a process through which there is a focus on presenting the real situation starting from the ideal situation or the proposed one, based on the entries in the system derived from norms, rules and directions of the management system. The process has three stages: establishing the ideal situation, establishing differences that may be considered in comparing the real situation with the ideal one, as well as establishing the real situation on the basis of entries in the system that is economically and socially controlled.

- the analysis and evaluation of the results and deviations consists in establishing the deviations of the real situation from the ideal one and from the differences accepted, and then evaluating the corrective measures to be taken. Also in this stage there must be established the causes that led to the deviations.

- the use of the findings is the process through which there are established exits from the system in the form of corrective measures of the deviations that can be used for the proper functioning of the controlled economic-social system, measures of improving the legislative system and devising recommendations to the management system of the economic-social activity.

Since in accountancy balance there must be a record of the material, human and financial resources of the organization, the process is different for each separate case, this way:

- ✚ *the control of material resources* - implies the control, be it corrective or preventative - of the way of using and maintaining them, but also of planning maintenance and replacements so that the ongoing activities are not affected.

For the project it is important to finalize preventative maintenance before the last stage in the project's life-cycle. Planning this preventative maintenance can be very difficult because often in execution it is not known exactly the moment of finalizing the project. The techniques of control of material resources are: physical inspection, reception, storage, as well as the way of recording these in accountancy.

- ✚ *the control of financial resources* is much simpler, motivated by the fact that valid financial-accountancy regulations led to the appearance of adequate methods and instruments for financial control in accountancy and for the use of the financial resources of an organization. Most financial control focuses simultaneously on conserving financial resources and on their regular use due to the difficulties encountered in separating the two processes.

It can be noticed that the system of financial control is directly connected to the system of managing the economic-social activity, to the system of objective economic rules, to the economic-social process as well as to the accountancy balance. The objective economic rules can influence the organization and functioning of financial control. These largely depend on the way in which the management of the economic-financial activity, as well as that of the financial control, succeeds in creating a better connection between the two systems.

Between the system of managing the economic-social activity, the financial control system and the accountancy system there are connections of interference in the sense that the first system provides the purposes, objectives and norms, control establishes if the economic and financial activity is organized and carried out according to established principles or rules, and accountancy through its system of markers allows the evaluation and provision of information for the correction of the entire process of the investment project.

The essential moment of the process of control is the comparison. Comparison in control presents specific aspects depending on the nature of the controlled economic-financial operations and activities, the methodology in calculus and the evidence system. The compared operations or activities must be homogeneous, calculated and expressed according to the same methodology.

Methodologically, the system of financial control is a process of acknowledgement that implies several moments: knowing the established situation, knowing the real situation, knowing the deviations by comparing the real situation with the established one, conclusions, proposals, measures.

✚ *the control of human resources* focuses on the four main activities in the field of personnel: planning human resources, recruiting, selecting, guiding. Control applied in the field of human relations can appear also as a system of reaction in which there are many diverse activities, which constitute the so-called "evaluation of performance". The processes and evaluation procedures of performance accomplish two major objectives: of judgement and of development.

**To conclude, in the opinion of the PhD candidate,** planning control of investment projects derive from the three main factors that influence any project and that may later become hazards of partial or total failure of the project:

✚ **resources:** control must consider the regulation of the intensity in resource consumption during execution, with or without observing specific restrictive conditions - especially the analysis concerns the "problematic" resources for the investor;

✚ **cost:** there will be considered the analysis and optimization of the cost/ duration function, the analysis of the total cost concerning the avoidance of the projected level of expenses and the optimum use of funds;

✚ **time:** control focuses on solving the problems regarding the execution time of the project, the time reserves of each activity in the schedule, the identification of activities that form the critical path etc.

In most cases, projects take place exactly as planned, but sometimes they change components: size, objectives, budget, schedule, plan, priorities, hired personnel etc. Since change is inevitable, the management of the impact these changes have represents a key aspect of project control.

Although any change needs re-planning, re-approval and then a new execution, I consider that the best approach of change in a project is announcing it to the members of the team or only to the project management team, and asking for their opinions on the ways of implementing the change in the project.

#### NOTES:

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