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PROJECT MANAGEMENT AND PLANNED COST ACCOUNTING

The necessity of functioning in a volatile environment increases the likelihood of economic entities to organise work in the form of projects. Projects are temporary, atypical, include limited budgets with costs, and implemented by an interdisciplinary team. Project management is connected with the need for specific information, including financial information, to use in the characteristic phases of the project life cycle, i.e. initiation (definition), planning, execution, and closure. The purpose of the article is examine the possibility of using information provided by planned cost accounting in project management. The article defines and proposes, inter alia: what information resulting from planned cost accounting is useful in project management; what conditions should be met to provide it, and an outline of the planned cost accounting model to implement in the enterprises performing projects. The following research methods were used in the article: literature analysis, inductive, and deductive inference. Based on the conducted research, it was proposed that properly adjusted planned cost accounting for the informational needs of project management may be a useful tool in supporting this process.

Keywords: project management, projects' planned cost accounting, planning and controlling of projects' costs.

1. INTRODUCTION

Each economic entity has implemented, or will implement, a project at least once in its existence, and it is understood as an unusual and risky undertaking with a limited and budget. The project also distinguishes the interdisciplinarity and temporariness of a team of people created to implement it (Strojny, Szmigiel, 2015). Because of specific features, the organization of work in the form of a project is becoming more and more popular in entities that must operate in conditions of high variability and uncertainty. Depending on, among others, the number of projects implemented simultaneously, their degree of complexity, importance, duration, and budget values, there are different informational needs associated with managing them.

Project management involves the need for specific tools and information that are used in the characteristic phases of the project life cycle, i.e. initiation and definition, planning, execution and closure (Wysocki, McGary, 2003; PMBOK guide, 2013). Among the information supporting management, the position provided by accounting occupies a special place. The role of accounting in management should not be limited to the level

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of operational support in project planning and review, but should also manifest itself, among others in search of ways to improve the efficiency of project implementation, providing information to motivate project teams to achieve better results, and an information base for learning based on previously acquired experience (ada, Kozarkiewicz, 2007).

Among the many accounting instruments that can support project management, it is worth noting planned cost accounting, which is a variation of a priori cost accounting, using in its construction both actual costs and costs that are expected to be incurred in the future. Because of its essence, it can be useful in project management. However, at present there is an information gap in this regard. Therefore, the article addresses the research problem regarding the way enterprises can use planned cost accounting as a tool supporting project management.

The purpose of the article is to indicate the possibility of using information provided by planned cost accounting in project management. The article defines and proposes, inter alia, what information from planned cost accounting can be useful in project management, what conditions should be met in order to provide it and a draft of the planned cost accounting model that could be implemented in the enterprises performing projects.

The following research methods were used in the article: literature analysis, inductive and deductive inference.

2. INFORMATION REQUIREMENTS IN PLANNING AND CONTROLLING PROJECT COSTS

Project management can be defined as taking actions ensuring the achievement of assumed aims within a specified time and budget. Project management includes all specific management functions, including planning, organization, motivation, and review (Strojny, Szmigiel, 2015). One of the key factors determining the project's success, in addition to creating value for clients, is cost management enabling the effective use of resources to achieve the assumed aims (Venkataraman, Pinto, 2008). In the practice of project management, cost management covers all activities related to planning, estimating, budgeting and controlling costs, as well as financing the project in a way that allows its implementation within the approved budget (PMBOK guide, 2017).

The relationships between project life cycle phases and project costs are presented in Table 1.

Project costs are planned in several stages. During initiation and definition of the project, there is cost planning – usually for the needs of strategic management. The costs estimated at this stage include, among others, the manner for conducting a preliminary assessment of the project's profitability and the possibilities of its implementation. Because of the fact that cost estimates are created here at a significant level of generality, they are often laden with serious errors (Wysocki, McGary, 2003; PMBOK guide 2017).

When the project successfully passes the first phase, the planning phase begins, which includes creating a cost budget at the operational level – which is an elaboration of the budget from the initiation and definition phase. The cost budget created at this stage is closely related, inter alia, with the scope of work to be carried out under the project, the necessary resources and schedule (PMBOK guide, 2017). The project cost budget from the planning phase, upon approval, becomes the budget in force during the project’s execution and closure phases, and its fulfillment is one of the most important challenges for the project team.

Table 1. Relationships between project life cycle phases and project costs

Project life cycle phase	Phase characteristics	Project life cycle phase and project costs
Initiation and definition	The emergence of project ideas, their selection and general description of the project (definition).	Estimating project costs is most often done at a high level of generality and is primarily used for the preliminary assessment of the project's profitability and feasibility.
Planning	Project implementation planning, including appointing a project team, creating a work breakdown structure, schedule, resource planning (human, material and financial).	Cost estimation is carried out in detail, including based on the work breakdown structure, schedule, resources needed to implement the project. On this basis, a cost budget is created, which, after approval by authorized persons, is in force during the implementation of the project (called the base cost budget). In this phase, a re-assessment of the project's profitability may be carried out based on more detailed data than was in the initiation and definition phase.
Execution	Project implementation, including monitoring, control and guidance	At the implementation stage, there is primarily monitoring of actual costs resulting from the work carried out in the project, their review, i.e. comparison with planned costs, determining the size and causes of variances. In the event of changes to the project, it may be necessary to adjust planned costs for work not yet completed, or to plan costs for new works that were not previously planned. When there are significant variances of the actual costs of completed works from planned costs and / or significant changes in the planned costs of yet unfinished works, it may be necessary to reassess the profitability of the project based on the value of actual and planned costs.
Closure	Project closure, including receipts, settlement of accounts, documentation	In this phase, the total actual costs resulting from the implemented project work are compared with their planned costs, which allows determining the value of the total variances.

Source: personal study based on (Trocki, 2012; Williams, 2008).

Ensuring the implementation of the project in accordance with the assumed plans requires constant monitoring and review of the performed works, also in terms of costs. It is worth emphasizing, that it is insufficient to compare planned costs with actual costs, as it is also necessary to take into account the scope of work planned and completed to the date of review (PMBOK guide, 2017).

Therefore, analyzing the need for financial information in individual phases of the project life cycle, one can notice that in the phases of initiation, definition and planning of the

project, information on planned costs are crucial, while in the phases of execution and closure of the project both information on planned and actual costs are significant.

It is worth emphasizing that in the project execution phase it is important to have a monitoring system that will provide up-to-date information enabling linking actual costs with specific activities, determining whether they were reasonable, plotting a trend of changes and taking immediate remedial actions if adverse results occur (Lester, 2014). For this reason, in reviewing the project, the earned value method is often used, which not only assesses the degree of cost budget implementation and work schedule, but forecasting the total costs and duration of the project is also possible, including on the basis of the size and reasons for the variances found on the day of the review (Practice Standard for Earned Value Management, 2005; PMBOK guide, 2017; Heagney, 2012). Therefore, information on planned and actual costs, as well as the conclusions drawn from the analysis of variances discovered during particular project implementation reviews play a key role in effective project management. They allow not only a quick response to variances from the plan during the execution of projects, but can also be a valuable element of the lessons learned, which allows improving actions taken in the future (Kourounakis, Maraslis, 2016; Williams, 2008).

In the context of the indicated demand for cost information in project management, properly organized planned cost accounting can be a useful tool.

3. THE ESSENCE OF PLANNED COST ACCOUNTING

Cost accounting, which is an obligatory element of any accounting system, is based solely on actual costs. Therefore, the use of information originating from it in management is limited. Planned cost accounting has greater possibilities in generating useful management information (e.g. due to the possibility of presenting actual costs separated into planned costs and variances). Planned cost accounting is based on the costs expected to be incurred for the implementation of specific economic tasks while rationally using the enterprise's resources and production capacity. Therefore, planned costs are economically justified costs, being a consequence of the planned level of activity (Nowak, 2010).

The essence of the planned cost accounting, which, moreover, determines its particular usefulness, is to compare actual and forecasted quantities and determine the differences between them – variances. These differences can arise for a number of reasons, including: price volatility, consumption of a different quantity of resources than was assumed in the plan, errors or deficiencies in documentation, negligence of employees, etc. The classification of variances, due to different criteria, is presented in Table 2.

Variances generally signal irregularities in the course of economic processes and / or incorrect determination of the level of planned costs. Therefore, quickly detecting variances and identifying the causes for their occurrence often allows limiting or eliminating their negative effects. In the case of favorable variances, determining the reason for their occurrence may allow undertaking actions to strengthen this effect.

Table 2. Classification of variances due to selected criteria

Criterion for dividing variances	Classification of variances and characteristics
The reason for the variances	• Variances due to changes in planned costs – occur when there is a permanent change in the assumptions adopted in determining planned costs. • Current variances – the reason for their occurrence are various situations related to the ongoing implementation of the assumed activities. • Inventory variances – may appear when comparing the inventory status with the actual status.
The method for documenting variances	• Documented variances – the quantities differentiating actual costs from planned ones are included in detail in the additional documentation on an ongoing basis. For this reason, it is possible to quickly and thoroughly analyze the reasons for their occurrence, as well as react immediately to them or draw conclusions for the future. • Undocumented variances – their identification is based on a periodic comparison of actual and planned costs. In this case, there is no documentation containing detailed data confirming their creation. Generally, very general information is obtained, since the size of the variances is usually the result of several factors and sometimes it is almost impossible to determine the exact reasons for their occurrence.
Possibility of determining the causes, locations and persons responsible for the occurrence of variances	• Identifiable variances – they occur when it is possible to identify the causes, locations and persons responsible for their occurrence. • Unrecognizable variances – they occur when it is not possible to identify the causes, locations and persons responsible for their occurrence.
The level of significance of variances	• Significant variances – exceeding the level of limit values adopted in the enterprise (specified by a value or a percentage). • Insignificant variances – within the level of limit values adopted in the enterprise (specified by a value or a percentage).
Possibility of influencing variances	• Dependent variances – occur when it is possible to shape the level of variances. • Independent variances – occur when the level of variances cannot be shaped.

Source: personal study based on (Nowak, 2010; Czubakowska, 1996; Szydełko, 2004; Sołtys, 1999).

4. OUTLINE OF THE PLANNED COST ACCOUNTING MODEL TAILORED TO THE NEEDS OF PROJECT MANAGEMENT

When designing planned cost accounting that would be able to provide useful information in project management, the need to implement the management function, i.e. planning, organizing, motivating and controlling, in particular phases of the project life cycle should be taken into consideration. The ability to provide useful information for management in connection with project life cycle phases through planned cost accounting, is shown in Table 3.

Table 3. Ability to generate information from planned cost accounting useful in management and project life cycle phases

Project life cycle phase	Information generated from planned cost accounting useful in project management
Initiation and definition	In these phases, the planned cost accounting may provide information on actual costs incurred for similar projects and / or works in the past, variances from planned costs, and the reasons for them. This information, when properly used, can assist in planning the costs of new projects, protect against errors made in the past, and contribute to a more efficient use of resources.
Planning	
Execution	In this phase, planned cost accounting can provide information on the actual costs of works carried out, the costs planned for these works, the size of variances and the reasons for their occurrence. Among the most common reasons for variances in actual costs from those planned in the projects, can be mentioned: • change of project aims and / or emergence of unforeseen problems to be solved, necessitating the implementation of additional works, • underestimation and / or overestimation of cost budget items, • change in the amount of resource consumption, • change in rates of resource consumption costs, • a change in the duration of work, which often entails greater than expected resource consumption etc. Depending on the adopted method for determining variances, this information may be detailed (variances for a given cost item are determined in the total amount and broken down into, among others, variances because of changes in the amount of consumption and rates) or general (variances for a given cost item are set in the total amount). The information mentioned above is particularly useful in monitoring progress in project implementation, motivating the project team and controlling further project implementation.
Closure	In this phase, planned cost accounting can provide information on the total actual costs of the works conducted, the costs planned for these works, the size of the variances and the reasons for their occurrence. This information is part of the lessons learned that allows an increase in the efficiency of future actions and better use of resources. They should be used, inter alia, in the initiation and definition phases, as well as in the planning of subsequent projects.

Source: personal study.

Benefiting from the use of information from planned cost accounting in project management will require the introduction of appropriate modifications in accounting records, structure of accounts, financial and accounting documentation, and above all, regularity in determining and analyzing variances between actual and planned costs.

The development of cost accounting principles and the structure of accounts as part of planned cost accounting supporting project management should precede the resolution of the following issues:

I. what relationships should occur between planned cost accounting and project cost budgets,
II. in what sections should project costs be recorded as part of planned cost accounting,

III. whether, and if so, to what extent planned cost accounting is to be integrated with the existing cost accounting kept in the economic entity,
IV. details of variances of actual costs from planned costs useful in project management.

I. The relationship between planned cost accounting and project cost budgets is as follows:

- The underlying budgets set the maximum cost levels that should be incurred during the implementation of projects, and therefore constitute the reference point for planned costs in planned cost accounting.
- At the stage of project implementation and closure, information on the actual costs of completed works, variances from planned costs and the reasons for their occurrence should come from planned cost accounting. This information can be used in the financial and material review of project progress, motivating the project team (e.g. based on the results achieved [Strojny 2013, p. 194]) and taking actions to control the further implementation of the project.
- Information from planned cost accounting concerning implemented or completed projects, especially conclusions from the variance analysis, should be used when setting the cost budgets for new projects in the initiation, definition and planning phases.

II. Obtaining maximum benefits from the relationships between project cost budgets and planned cost accounting will be possible when the plan of accounts is adapted to the classification of costs included in budgets. In addition, the structure of accounts should be detailed enough to allow reports on actual costs, planned costs and variances, consistent with the structure of costs in project budgets. Among the classification of costs used in project budgets, it is worth mentioning (Klinowski 2010; Łada, Kozarkiewicz 2010):

- costs by type,
- direct and indirect costs,
- variable and fixed costs,
- costs according to activities (tasks), project stages, milestones,
- costs according to the units implementing the project.

In practice, it is often the case that several cost classifications are combined simultaneously in the project budget.

III. From the point of view of the demand for cost information, especially at the stage of project execution (so that it is possible to provide current data necessary to carry out reviews on the progress of works and the costs incurred for them, including an analysis of the causes of variances), it is important that planned cost accounting be systematically performed and on an ongoing basis, which ensures its integration with the economic entity's existing cost accounting, by appropriately expanding the structure of accounts. However, this will not always be possible, even if considering the need to ensure consistency of the structure of cost by nature with their arrangement in project budgets. Nevertheless, incorporating planned cost accounting into existing cost accounting would be desirable because of the reduced labor intensity of this solution. In the absence of such a possibility, planned cost accounting for the needs of project management can be performed concurrently, e.g. in an additional set of accounts.

IV. Given the method for determining the variance of actual costs from planned costs, it is important to choose whether they are to be determined in detail (e.g. divided into

variances due to changes in the amount of consumption and unit rates) or in general (in the total amount).

A detailed variant should be used to determine variances of actual costs from planned costs in all those items that are of significant importance in projects, and whose formation is influenced by decision-makers. However, considering the speed in determining variances and the cognitive possibilities of their causes in this variant, covering at least the direct costs of projects in the system of activities for which exact planned values can be determined is suggested (preferably as an effect of consumption volume and unit rate).

It should be remembered, however, that detailed determination of variances involves keeping appropriate documentation, in which each recorded cost item is presented as the actual cost, planned cost and possible variances; which is labor-intensive, and thus costly. The indication of cost items for which the variances will be determined in detail is of course for the management and is a matter of discretion.

Determining the variances in a general way, i.e. in the total amount by comparing the actual amounts included in the cost accounting system with the planned amounts resulting from the budget, seems to be more rational in relation to the indirect costs of projects and to all those cost items for which it is difficult to precisely set planned costs, or they are insignificant.

The established causes of variances should be properly described in the documentation and constitute a compulsory element of reporting on project cost control.

Table 4 presents a sample structure of accounts for project A in planned cost accounting, whose cost budget was prepared in a task-by-type system, with the division of costs into direct and indirect. It was assumed that the cost by nature of project A in the planned cost accounting will be entered in the off-balance sheet records, in an additional set of accounts.

Table 4. Sample structure of accounts for project A in planned cost accounting in an additional set of accounts No. 9

Account number	Account name
901	**COSTS OF THE "A" PROJECT**
901 01	**DIRECT COSTS**
901 01 01	***Task 1***
901 01 01 01	cost by nature 1 - actual costs
901 01 01 01 01	cost by nature 1 - planned costs
901 01 01 01 02	cost by nature 1 - variance from planned costs
901 01 XX	***Task …***
901 01 XX XX	cost by nature… - actual costs
901 01 XX XX 01	cost by nature... - planned costs
901 01 XX XX 02	cost by nature... - variance from planned costs
901 02	**INDIRECT COSTS**
901 02 01	indirect costs - real
901 02 01 01	indirect costs - planned
901 02 01 02	indirect costs - variance from planned costs

Source: own study.

In the example presented in Table 4, the costs budget of project A assumes that direct costs are costs that can be clearly allocated to individual tasks and expressed as the result

of the planned amount of resource consumption and the planned unit cost price. Indirect costs were planned in the total amount resulting from the result of the specified % mark-up and the value of direct costs. Therefore, it was assumed that within the planned cost accounting, variances will be determined on an ongoing and detailed basis for all direct cost items of Project A. Actual indirect costs will be recorded at the end of each month in the global amount (resulting from the specified % mark-up and the value of actual direct costs), broken down into planned costs and variances.

The presented model of planned cost accounting adjusted to the needs of project management is only a preliminary concept and is the result of literature studies. Its implementation in practice in a particular economic entity is possible after solving a number of problems related to, among others, defining information needs in the field of project management, changes in the accounting system, developing appropriate financial and accounting documentation (including principles for determining and documenting variances), and a description of accounting documents. There is no doubt that the implementation of planned cost accounting for the needs of project management will increase the costs of accounting, so first and foremost, the economic entity should assess whether it will be a viable solution.

5. CONCLUSION

The swiftness of economic changes often forces economic entities to act flexibly. Therefore, the organization of work in the form of projects that are of a temporary nature enjoys growing interest, which makes it possible to adapt to current needs to some extent. Project management is not possible without the proper information. Among the multitude of information generated for the purposes of project management, financial information, including planned and actual costs, holds a special place. One of the tools that can provide such information is planned cost accounting.

Planned cost accounting can support project management, inter alia, in:

- making rational decisions regarding the selection of projects to be implemented by using information on planned costs to assess their effectiveness,
- developing and applying incentive systems for project teams, mobilizing them to use resources efficiently,
- controlling the implementation of projects, by determining the amount of variance of actual costs from planned, together with identifying the reasons for their occurrence, as well as indicating possible actions to be taken to correct the effects of irregularities found, or to prevent their reoccurrence in the future,
- improving the methods of selection, organization and implementation of projects by using information on planned costs, as well as conclusions from the analysis of variances of actual costs from planned ones,
- effective use of resources in achieving assumed goals.

It is worth noting that planned cost accounting allows actively shaping the level of costs incurred, not only by analyzing variances during the implementation of actions, but also by forcing the examination of costs before they are incurred, which should be considered as one of its most important advantages (Bryła, 2014).

In addition, information from planned cost accounting is useful in risk management, as one can infer the level of risk based on the size of the variances, i.e. the larger the variances, the greater the risk of non-compliance with planned costs (Nowak, 2016) and appropriate action can be taken.

Based on the conducted research, it seems reasonable to state that properly adjusted planned cost accounting for the informational needs of project management may be a useful tool in supporting this process.

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