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OPTIMIZING A PROJECT BUDGET: THE CASE OF A MINING COMPANY

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The article discusses the process of project budgeting in mining industry. In particular, the author focuses on the efficiency of process. After considering the ways of increasing the budgeting efficiency, the paper goes on to study the real case of mining project. Furthermore, with the help of the conducted interview with the expert of a chosen company and the analysis of project documents, the article describes the experience of budgeting process and makes some recommendations for budgeting efficiency improvements.

Keywords: mining industry, project budgeting, cost reduction, digitization

The mining industry plays a crucial role in global economy and provides raw materials for various industries. Effective project management is vital to ensure the success of mining projects, and one of its key aspects is budgeting [1].

This research paper is aimed at analyzing the process of cost estimation and budgeting in a company, identifying the weaknesses and searching for ways to optimize budgeting in order to increase its efficiency.

Literature Review

The following section gives an overview of management literature related to the topic to understand the nature of the project budgeting process in mining.

Let us start with defining the peculiarities of mining projects. Biery and Stewart believe that mining projects are more costly and have poorer operational performance in comparison with projects of similar scope in other industries [2].

It means that the control over the expenses must be more accurate, which is complicated. Hollmann agrees with this opinion and proposes a complex algorithm of cost estimating and budgeting (figure 1) that covers all stages of the process [3].

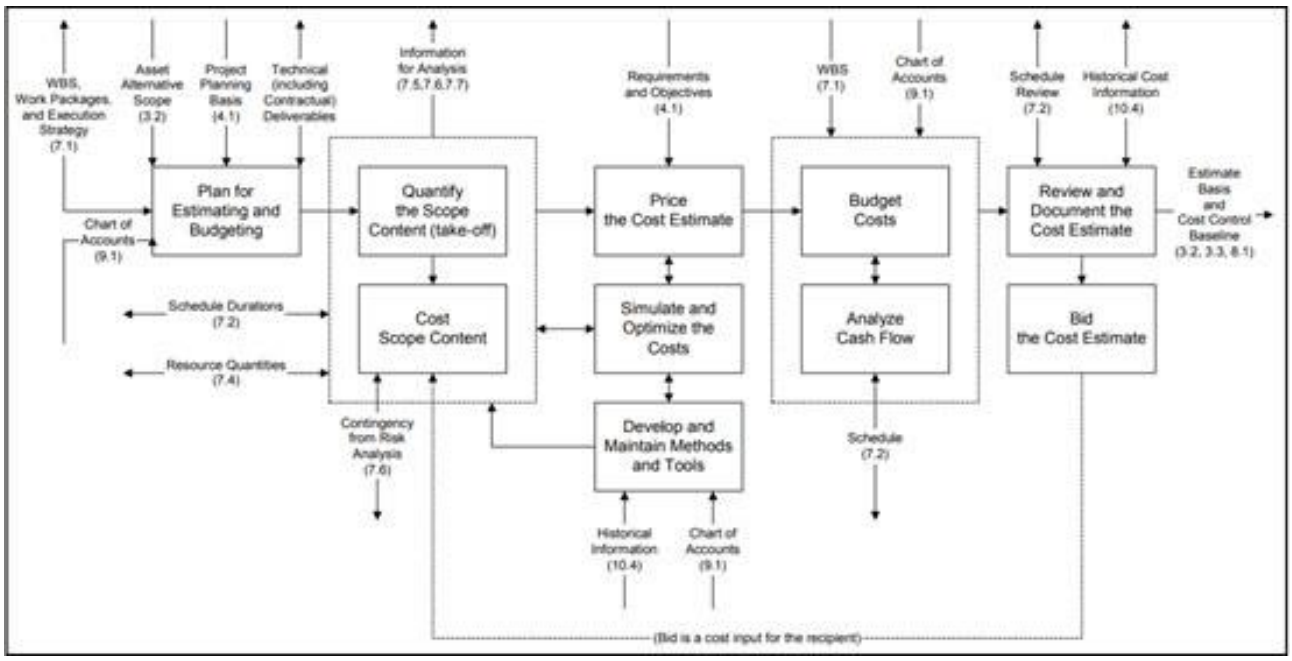

Fig. 1. Process Map for Cost Estimating and Budgeting

The budget estimate classification system for mining industry is also specific [4]. It includes five classes that match five coherent stages of project development: planning, screening options, funding authorization, project control and fixed price bid check estimate [5]. Each class is identified by a project maturity level of and expected accuracy range of costs. The authors highlight the idea that sticking to the classification when estimating a budget of a project helps to reach the highest level of effectiveness during the project realization. Pickett and Elliott believe that collecting accurate historical project data, as well as analyzing the situation in detail and reporting, can help a company achieve more effective capital projects [6]. Ulrich and Rieg agree with this position but focus more on the digital technologies for controlling the subprocess of planning, budgeting and forecasting because they also help to gain and store the lessons learned [7].

Methods

The research paper is focused on a mining company which specializes in development of ore, copper, and gold deposits. The company employs 2800 people.

The study is aimed at researching the nature of the project budgeting system of the company and searching for ways to ensure budget compliance. The paper is based on both qualitative and quantitative methods of data collection. The online interview with the budget manager of the mining company included seven questions which aimed at getting the overall understanding of how the project budget is estimated and what actions the company takes to adhere to it. In particular, the questions concerned the discussion of the personal experience of the expert. The questions asked what last project the expert worked on; whether the budget was met; if there were a lot of overheads; what the general elements of a project budget are; what software the expert uses and might recommend; how risks are taken into account when estimating a project budget; and what tips the expect can give to meet the budget.

For more objectivity and balance, it was necessary to analyze the project budget reports, provided by the budget manager. The method involved reviewing specific financial data, identifying variances, investigating reasons behind them, and assessing the overall financial state of the project. This allowed making a conclusion about the necessity of the adjustments to the budgeting process.

All of the methods facilitated the acquisition of precise and equitable information regarding the existing project budgeting system of the company and identified the necessity for its improvement.

Results

The section summarizes the collected data from the online interview and the analysis of documents including the project chart, the financing schedule, and the basic project plan.

Concerning the last project, the respondent described it as a short-lifetime factory modernization. The budget manager mentioned that the project budget and work schedule were not formalized which meant that the control over its realization was complicated, leading to missed deadlines and many unforeseen expenses. There was a lack of formalization due to the fact that the realization of a project was aimed to minimize risks of losing the company's main customer and had to be done as soon as possible. The budget manager was confident that formalization would not have influenced the project decision-making process in that case but it would have given more possibilities to control the progress and expenses at every stage of the implementation. Furthermore, the respondent admitted that accounting is implemented based on overall expenses of the project. As for the articles of expenditure, the interviewee

pointed out that all the items matched the initial level of WBS (Work Breakdown Structure) and consisted of research and development, engineering design, procurement, construction and installation, and commissioning. Depending on the technical structure of the project, all of these top elements can be detailed in a more specific way, complicating the structure. Answering the question about budgeting software programs, the respondent mentioned that in his opinion it is usually not rational to install additional software to track operations on a budget when the company already has accounting software because it doubles the work. He also emphasized that it was much more effective to adjust analytics if necessary for the budget manager in an accounting program. The project manager himself conducts specific add-ons in Excel as the company's projects are not large, creating the expenses controlling structures. Then the interviewee explained that risks are usually either offset by a contingency fund, made specifically to cover the unforeseen expenses, or included into the budget directly. He also specified that the second method can be possible only when there is an opportunity to forecast the risk mitigation initiatives. For the last project, risks were not taken into account. According to the respondent, the possible failure of that particular project was incomparable with any risks. Moreover, some decisions of budget overheads were made intentionally in order to meet the deadlines as they were much more important in that case. The last question to the project budget manager was about the tips he could give to stick to a budget. The respondent said that any project manager should always remember that budgeting is an ongoing process meaning that adjustments are needed during the whole project. He also added that the best project manager can do is to track every item of expenditure because permanent control guarantees proper realization of the project.

Before summing up the results of the conducted analysis of the provided documentation it should be noted that the company's financial data cannot be revealed for ethical reasons. That is why it is not disclosed here.

All in all, the analysis of the project chart, financing schedule, and the basic project plan confirmed the statements of the respondent. The project chart does not specify the budget amount, evaluation methods, frequency of reporting, and expected accuracy level of costs. The financing schedule was developed in the middle of the project implementation, when almost all procurement contracts were signed. The document was not approved. The basic project plan was approved 2 months after the project initiation.

Discussion

The main purpose of the research was to find weaknesses in the project budgeting process of the company and identify any inconsistencies. Both the interview and the analysis of project documents showed that the budget was estimated very roughly without taking into account external factors. Moreover, the budget was made after the initial stage of the project. Even though the project budget manager assures that lack of formalization at the beginning of the project did not affect the decision-making process, it leads to difficulty meeting the deadlines and controlling the expenses in the future. On the one hand, formalization and budget estimation should start from the very beginning, from the introduction of an idea of a project [5]. With the development of a project, calculations become more and more accurate. On the other hand, Marecki and Wieloch assume that a detailed budget should indeed be differentiated from one project to another as detailed approach is not always necessary [8]. It consumes many resources that could be used more rationally, especially, at the initial stage of the project. Bergmann's research also confirms the position of the respondent. According to it, the level of digitization, which usually provides information for detailed budgeting, should match the specific needs of a project [9]. It should also be mentioned that such decisions not to formalize the budget at early stages must be made deliberately, by substantiating this position in a project chart.

Also, the research revealed that accounting of the company did not consider the cost of individual items. This practice did not let the company collect the project data that might be of use in the future [6]. Moreover, the lack of detailed accounting of project expenses complicated the control over the expenditures. As the respondent mentioned, the company did not have any additional analytical data in accounting software that could be used to track operations on a budget. In fact, lack of technologies deprives the company of different opportunities in terms of increasing efficiency and effectiveness [7].

Even though the collected data is limited to one case only, it still exposes key problems of the current project budgeting process. Also, it would be useful to have more time and experience to evaluate the topic more objectively.

However, the conducted research makes it possible to make some recommendations. First of all, the budgeting process should be formalized. The project chart should be created at the project initiation stage based on the available information at the time [10]. It should summarize the requirements, goals and key points of the project. Secondly, the development of the budget template is advisable as it optimizes the budgeting process for future projects. It is also recommended to make monthly reports (budgeting plan expenses, actual expenses and the forecast). It will give an opportunity to assess the financial situation and adjust the budget if needed. Finally, it is necessary to change the accounting configurations in order to meet the project budget structure.

Conclusion

Summing up, the project budgeting in the considered case of the mining company does not fully meet modern requirements of the budgeting process. Nonetheless, the company does understand the necessity of making changes. This study might be of use to the project managers of the company as it discusses the flaws and gives some useful recommendations. Following the

recommendations, the company can gain more control over budgets of its projects, which will result in the reduction of capital cost and project risks. It can also improve the decision-making process of the company. ■

3. Amos, S. (Ed.). (2004). Skills & Knowledge of Cost Engineering (Fifth Edition). AACE International.

4. Biery, F., & Stewart, M. (2014). Benchmarking mining and minerals processing projects. AACE International Technical Paper, EST.1619.

5. Hollmann, J. (Ed.). (2006). Total Cost Management Framework: An Integrated Approach to Portfolio, Program, and Project Management (First Edition). AACE International. https://caspen.narod.ru/pm/pdf/TCMFramework_WebEdition.pdf

6. AACE International. (2020). Recommended practice: Cost estimate classification system - as applied in engineering, procurement, and construction for the mining and mineral processing industries (Vols. 47R-11).

7. AACE International. (2019). Recommended Practice: Development of cost estimate plans - as applied in engineering, procurement, and construction for the process industries (Vols. 36R-08).

8. Pickett, T. W., & Elliott, B. G. (2005). Transforming historical project data into useful information. AACE International Transactions. EST.02. https://www.costengineering.eu/images/papers/Transforming_Historical_Project_Data_Into_Useful_Information.pdf

9. Ulrich, P., & Rieg, R. (2022). Digitization in planning, budgeting and forecasting (IGC, Ed.). International Group of Controlling. https://www.igc-controlling.org/fileadmin/pdf/Study_Report_-_Digitization_in_Planning__Budgeting_and_Forecasting.pdf

10. Marecki, K., & Wieloch, M. (2019). Dilemmas of the budgeting process. In Journal of Management and Financial Sciences: Vol. XII (pp. 61–69). Warsaw School of Economics Collegium of Management and Finance. https://econjournals.sgh.waw.pl/JMFS/article/download/1854/1651/

11. Bergmann, M., Brück, C., Knauer, T., & Schwering, A. (2020). Digitization of the budgeting process: Determinants of the use of business analytics and its effect on satisfaction with the budgeting process. In Journal of Management Control (Vol. 31, pp. 25–54). https://doi.org/10.1007/s00187-019-00291-y

12. Brown, A. S. (2005). The charter: selling your project. Paper presented at PMI® Global Congress 2005—North America, Toronto, Ontario, Canada. Newtown Square, PA: Project Management Institute. https://www.pmi.org/learning/library/charter-selling-project-7473

СПИСОК ЛИТЕРАТУРЫ:

AACE International. (2019). Recommended Practice: Development of cost estimate plans - as applied in engineering, procurement, and construction for the process industries (Vols. 36R-08).

AACE International. (2020). Recommended practice: Cost estimate classification system - as applied in engineering, procurement, and construction for the mining and mineral processing industries (Vols. 47R-11).

Amos, S. (Ed.). (2004). Skills & Knowledge of Cost Engineering (Fifth Edition). AACE International.

Bergmann, M., Brück, C., Knauer, T., & Schwering, A. (2020). Digitization of the budgeting process: Determinants of the use of business analytics and its effect on satisfaction with the budgeting process. In Journal of Management Control (Vol. 31, pp. 25–54). https://doi.org/10.1007/s00187-019-00291-y

Biery, F., & Stewart, M. (2014). Benchmarking mining and minerals processing projects. AACE International Technical Paper, EST.1619.

Brown, A. S. (2005). The charter: selling your project. Paper presented at PMI® Global Congress 2005—North America, Toronto, Ontario, Canada. Newtown Square, PA: Project Management Institute. https://www.pmi.org/learning/library/charter-selling-project-7473

Hollmann, J. (Ed.). (2006). Total Cost Management Framework: An Integrated Approach to Portfolio, Program, and Project Management (First Edition). AACE International. https://caspen.narod.ru/pm/pdf/TCMFramework_WebEdition.pdf

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Pickett, T. W., & Elliott, B. G. (2005). Transforming historical project data into useful information. AACE International Transactions. EST.02. https://www.costengineering.eu/images/papers/Transforming_Historical_Project_Data_Into_Useful_Information.pdf

Ulrich, P., & Rieg, R. (2022). Digitization in planning, budgeting and forecasting (IGC, Ed.). International Group of Controlling. https://www.igc-controlling.org/fileadmin/pdf/Study_Report_-_Digitization_in_Planning__Budgeting_and_Forecasting.pdf

Оптимизация проектного бюджета: пример горнодобывающего предприятия

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Статья описывает процесс проектного бюджетирования в горнодобывающей промышленности. В частности, автор акцентирует внимание на эффективности процесса. После рассмотрения способов повышения эффективности бюджетирования, было проведено исследование реального примера горнодобывающего проекта. С помощью проведенного интервью с представителем компании и анализа проектных документов, в статье описывается опыт процесса бюджетирования и приводятся рекомендации по улучшению эффективности этого процесса.

Ключевые слова: горнодобывающая промышленность, проектное бюджетирование, снижение затрат, информатизация