

PROFIT SHARING IN OVERCOMING PROJECT RESULTS AS A STRATEGY TO INCREASE REVENUE FOR CONSTRUCTION COMPANIES

TIELY ZURLO MOGNHOL, TÁSSIA FARSSURA LIMA DA SILVA, and SILVIO BURRATTINO MELHADO

Civil Engineering Program, Polytechnic School, University of São Paulo, Sao Paulo, Brazil

In the construction industry, the exceeding costs and reduced profits have become usual in the ongoing projects, which motivates companies to seek strategies to resolve these problems in order to increase the sponsors satisfaction. This paper examines the interface of design process management, risk management as well as cost management as a strategic tool for overcoming the results initially anticipated for infrastructure projects and consequently increase profits for construction companies. This analysis has been developed through literature review and case studies, in which fourteen project managers from six infrastructure projects of a Brazilian civil construction company were interviewed. The results demonstrate that: (1) the design process management reduces risks, deadlines and execution costs; (2) the identification and control of risks reduces project and execution uncertainties; (3) the cost management adequate to the stakeholders profile reduces the loss of results; and (4) the share of profits from overcoming results encourages active collaboration from employees in the conduction of management processes. The research also revealed that items (1), (2), (3) and (4) relate in a cyclical way, in which item (4) propels the other items, and the increase in profits feedback into the process.

Keywords: Construction management, Design process management, Risk management, Cost management, Cost control, Stakeholders.

1 INTRODUCTION

The construction industry represents a very important segment in the national economic scenario, contributing to 4.5% of 2018's GDP according to data from the Brazilian Chamber of Construction Industry (CBIC 2019). In general, industry data from this sector are indications of warming or stagnation in the economy. Among market oscillations, the construction company's success or failure is strongly related to the strategic direction adopted by the sector. Morais (2005) points out that, through strategic planning, companies define their objectives and identify the strengths and weaknesses, as well as the opportunities and threats present in the environment in which they operate.

One strategy adopted by different market segments, which aims to stimulate the production is profit sharing (PLR). For Corrêa and Lima (2006) PLR allows employees to have benefits from the success of the companies they work for, and this initiative has motivated a greater dedication in their activities, increasing their commitment to the company's results. In this context, the company, object of this study, has implemented well-defined management processes aimed to

increase project results and, as an incentive, the company shares these results among employees, a benefit besides the company's PLR. The aim of this paper is to evaluate how the design process management, risk management and cost management contribute to increased project profits of a construction company and, in a complementary way, how sharing this profit with the project team encourages employees to collaborate and execute the management processes effectively.

2 LITERATURE REVIEW

2.1 Profit Sharing (PLR)

Organizations are formed by professionals with different interests, thus, it is necessary to align individual and organizational interests for survival and growth of all those involved (Marquart *et al.* 2012). In this regard, strategic remuneration plays an important role in construction companies, by paying incentives to employees who manage to align their performance with what the company expects to achieve. According to the authors, strategic remuneration can be defined as “a balanced combination of different remunerations forms, aiming to align the remuneration with the organization’s strategy, harmonizing interests, contributing to the concepts generation and acting as a means to achieve the expected results”.

Wood Jr. and Picarelli (2004b) present five categories of strategic remuneration: indirect salary or benefits, responsibility or functional remuneration, knowledge or know-how remuneration, complementary pension plan and variable remuneration. The PLR is a variable remuneration based on the company’s results. In civil construction, the companies’ results are considered as the sum of the projects’ outcomes, therefore it is necessary to create strategies to enhance these results. Marquart *et al.* (2012) also points out that the result can be measured by the employee’s individual performance evaluation, based on criteria such as: quality, productivity, profit contribution, achievement of goals, among others.

According to Xavier *et al.* (1999) the profit or result sharing is divided among the majority of employees, from operational, managerial and high administration levels (Figure 1). Hence, the project result participation can be more attractive, since the value is shared with a smaller number of employees.

2.2 Project Management Processes

The construction segment has a number of intrinsic characteristics: the designs are unique and have low recurrence, the product is fixed, and the teams are movable. These characteristics demand well-defined management processes and a greater commitment of the teams to remain in the company. As focus of this research, three processes will be analyzed: project process management, risk management and cost management.

For Oliveira *et al.* (2004), the design in civil construction should inform the product physical characteristics, allow the technological innovations introduction, reduce pathological problems, and ensure quality, rationality and constructability characteristics, creating positive reflexes, and reducing time and final costs. It should be noted that wrong decisions in design, such as lack of communication between the agents involved and lack of control of design processes may be responsible for waste in the various stages of project implementation. In this sense, Ceotto (2011) highlights that the increase of errors in technical solutions and the lack of a critical analysis of the design can rise the costs and execution time. Moreover, the quality of the design is a fundamental tool to solve this problem.

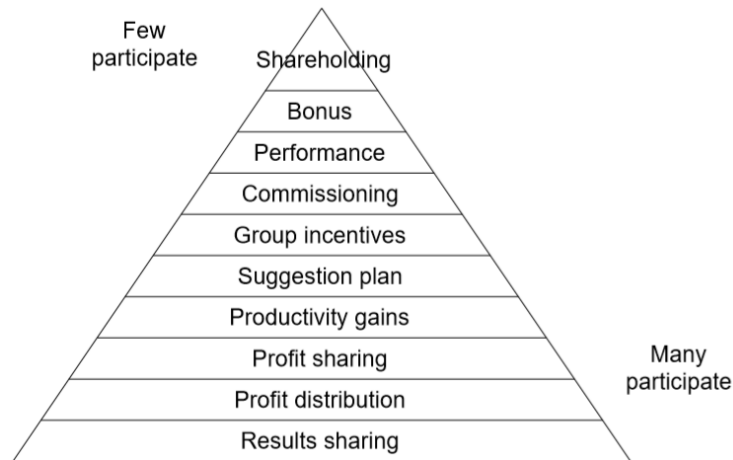


Figure 1. Forms of variable remuneration (Xavier *et al.* 1999).

Due to the unique characteristics of the projects, it is necessary to create a controlled environment and, as highlighted by Silva (2009), to avoid or mitigate risk situations, the risk management processes should be implemented at a preliminary stage of the project execution. This will enable the risks identification in time to analyze and define responses strategies to those risks. For negative risks, responses are needed to eliminate, mitigate and transfer, and in the case of positive risks, responses aim to explore, improve and share. In this context, Xia and Chen (2011) highlight the importance of knowing the processes and how to use the risk management tools, as it is fundamental for the project's successful completion. The challenge for managers is concerning in choosing the most appropriate method for each project to be executed and dealing with the effective risk management application throughout the project lifecycle.

Project cost analysis is a valuable tool for managers to make correction decisions on execution. Therefore, reliable information is required for cost management to become efficient. According to Kern *et al.* (2006), this information must be able to support different decision-making processes in order to protect the project against the negative uncertainty effects. These challenges require from the construction companies a plan based on reliable information, since without a properly detailed cost estimate, there is no way to predict results, regardless of management competence and available resources (Liu and Zhu 2007).

3 RESEARCH METHOD

The research was conducted in two phases. The first corresponds to a literature review on profit sharing, focusing on project process management, risk management and cost management. The second is an evaluation through case studies (Yin 2001), aiming to identify how management processes lead to project outcomes. At this stage, six infrastructure projects were selected from a large construction company.

3.1 Case Studies Characterization

The six cases studies are related to port infrastructure projects located in different regions of the country, as shown in Table 1. The projects selection is due to the following criteria: similar execution projects and client (contractor); well-defined organizational and processes structure; access to data and information; and available professionals.

Eight managers and four project coordinators with ten years or more experience in infrastructure projects were interviewed. The selection of respondents is due to the following criteria: participation in more than one project as project manager or coordinator; and knowledge of project management.

Table 1. Characterization of case studies. Source: Research data.

Study	Summary scope	State	Design Responsibility	Client (contractor)
Case 1	Executive design development and execution of the offshore support berth and multiple use mooring terminal works	Rio de Janeiro	Construction Company (contracted)	Private
Case 2	Execution of civil construction works in the areas of the port terminal, retroport, various buildings and substations.	Maranhão	Client (contractor)	Private
Case 3	Design, materials, equipment and construction of port terminal (access bridge, two piers and retro area).	Rio de Janeiro	Construction Company (contracted)	Private
Case 4	Development of executive design and execution of works of structures of a waterway terminal.	Espírito Santo	Construction Company (contracted)	Public-private
Case 5	Executive project development, materials supply and services for construction and assembly of a regasification terminal.	Bahia	Construction Company (contracted)	Public-private
Case 6	Expansion works of an artificial island to increase the material stocking volume.	Rio Grande do Norte	Client (contractor)	Public

4 RESULTS

The studied company implemented, as variable remuneration, the sharing of overcoming results of all projects, that is, for the projects that increased profits, there was a bonus for the project team.

The variation between the project initial and the final result is controlled by periodic meetings, being an inaugural meeting (IM); follow-up meetings (FMs) every 6 months; and the closing meeting (CM). In all meetings, details of invoices, costs and profits are presented to the team as shown in Figure 2.

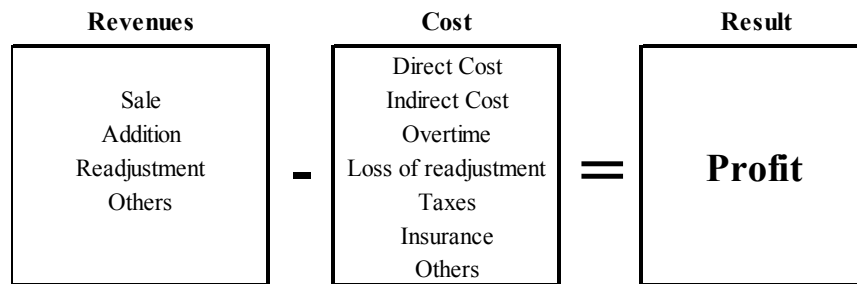


Figure 2. Calculation of project results. Source: Research data.

During project execution, managers of each team (engineering, design, planning, quality, safety, etc.) sought to increase revenue and reduce costs. The most important management processes for the overcoming goal results are project process management, risk management and cost management.

Design management process: all designs were assisted by an internal consultancy for design analysis and proposals for changes in executive methodologies. This consultancy aimed at reducing time and costs. In addition, the designs were sent for two external consultants' analysts to validate the structural calculations. After the internal and external consultants' approval, the designs were evaluated by a third analysis through the site coordination team for execution. This analysis sequence avoided execution errors due to design failure.

Risk management: risk and opportunity identification occur at all project lifecycle. The first analysis is preliminary to the project phase, with the main leaderships of the team participation. Project risks and opportunities are eliminated or incorporated into the project design phase. Construction risks and opportunities are identified in a second moment, after the project critical analysis. Managers evaluate and identify risk contingency and balance amounts to enable opportunities (revenue minus implementation cost). The contingency for risks is incorporated in cost and the opportunities balance are incorporated in the revenue. This process is continuous during the construction execution and the results are presented in the meetings (FM or CM).

Cost management: the cost management team controls the key services identified in the ABC budget curve to reduce unproductivity and rework; they also control the main quantities identified by the input ABC curve, in order to reduce losses and theft. Also, this team works closely with the production and planning to reduce the contract time, the overhead as well as the need for overtime.

At IM meeting, the contract manager presents to the company's board the result that can be achieved considering the data and information up to that point. During the construction execution, new project solutions are adopted; new execution opportunities are identified; some risks are eliminated, and these risks contingency are added to the results. At the CM meeting the final results are presented. All cases analyzed obtained results above the expectations, as shown in Table 2.

Table 2. Overcoming project results. Source: Research data.

Study	Project Profit (R\$)		Surplus profit (R\$) - overcoming project results - (B - A)
	Predict IM (A)	Performed CM (B)	
Case 1	21.5 million	67.75 million	46.25 million
Case 2	41.85 million	83.82 million	41.47 million
Case 3	61.88 million	83.16 million	21.28 million
Case 4	91.22 million	130.0 million	38.78 million
Case 5	148.66 million	189.1 million	40.44 million
Case 6	126.37 million	129.58 million	3.22 million

Usually the amount to be shared varies between 3% to 5% of the result overrun, depending on the team size and the exceeded value. The contract manager determines together with the company's board the sharing value and all the managers, engineers, technicians, and construction leader receive it. To determine the value for each employee it is necessary to consider the team

leadership, material loss reduction, reduced service lead times, and commitment to the goals set at IM and FM's meetings.

5 CONCLUSION

Despite the construction industry characteristics, it is possible to develop incentives to motivate employees to perform management processes aimed at optimizing production and increasing results. From the analysis of the case studies, it can be concluded that the management processes are important for these results evolution, since the design management process facilitates the technical and constructive solutions reducing risks, deadlines and costs execution. The identification and control of risks also reduce design and execution uncertainties; cost management combined with the main services and inputs control reduces losses; and the results obtained in previous projects encourage employees to seek more knowledge concerning management techniques and tools.

References

- Ceotto, L. H., *Project Coordination - An Issue That Needs Higher Development Priority*, Técnica Web Magazine. Retrieved from http://www.revistatechne.com.br/eng_Engenharia-civil/135/imprime93367.asp on 2011.
- Corrêa, D., and Lima G. T., *Employee Participation in Company Profits and Results: Lessons From International Experience*, Revista da Economia Contemporânea, 10(2), Rio de Janeiro, <http://dx.doi.org/10.1590/S1415-98482006000200006>, May / Aug, 2006.
- Kern, A. P., Soares, A. C., and Formoso, C. T., *The Target Cost in Planning and Controlling Costs of Construction Projects*, In: National Meeting of Technology in the Built Environment, 11., Florianópolis, SC, 2006. Anais ... Florianópolis: Antac, 2006.
- Liu, L., and Zhu, K., *Improving Cost Estimates of Construction Projects Using Phased Cost Factors*, Journal of Construction Engineering and Management, 133(1), 91-95, January, 2007.
- Marquart, A., Lunkes R. J., and Rosa F. S., *A Study On Strategic Compensation Practices In The Largest Companies In Santa Catarina*, Management and Society, Belo Horizonte, 6(13), 04-25, January/April, 2012.
- Morais, R. T. R., *Strategic Planning: A Necessary Good or Evil?*, Second ed., Culture Fund, Rio de Janeiro, 2005.
- Oliveira, OJ, Fabricio, M.M., and Melhado, S.B., *Improvement of The Design Process in The Building Construction*, Cib World Building Congress 2004 Proceeding, Toronto, Canada, 2004.
- Silva, V. F., *Construction Risk Analysis, Management Procedures Guide*, Integrated Master in Civil Engineering 2009/2010, Department of Civil Engineering, University of Porto, Porto, Portugal, 2009.
- Wood Jr., T., Picarelli, F. V., *Compensation and Career for Skills and Competencies: Preparing the Organization for the Age of Knowledge-Intensive Companies*, Third ed., Atlas, Sao Paulo, 2004.
- Xavier, P. R., Silva, M. O., and Nakahara, J. M., *Variable Compensation: When Results Speak Louder*, Makron Books, 28, Sao Paulo, 1999.
- Xia, D., and Chen, B. A., *Comprehensive Decision-Making Model for Risk Management of Supply Chain*, Expert Systems with Applications, 38(5), 4957-4966, May 2011.
- Yin, R., *Case Study: Planning and Methods*, Second ed., Bookman, Porto Alegre, 2001.