A review on: Strategic change towards cost-efficient and cost reduction construction projects
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ABSTRACT
The cost of public construction projects is a central topic in project management. However, studies have primarily focused on cost at the project level, not on cost management at the portfolio level. In this paper, we take the perspective of a government agency, conducting a strategic initiative to increase cost-efficiency in their portfolio of construction projects. We use an action research approach to investigate the dynamics of the initiative and the implementation of resulting actions to achieve lasting change towards cost-efficiency. Co-creating actions for cost-efficiency together with the project teams was important for the success of the strategic initiative. For successful implementation, alignment of the objectives of the initiative with organizational strategy, and knowledge transfer between projects is central. This study expands the project management literature regarding strategic cost management of portfolios of construction projects and provides practical guidance for organizations.

Keywords: Cost performance, Cost reduction, Cost-efficiency, public construction projects

1 Introduction
Any project-based organization (PBO) that wants to achieve sustainable change must take action. To achieve lasting impact, change must be institutionalized, which means learning from temporary activities into permanent practices. Various challenges in such environments have been investigated in the literature (e.g., Saunders et al., 2008; Stensaker et al., 2008; Kunisch et al., 2019; De Melo et al., 2020). However, these studies focus more on theory than reality. This study responds to the need for more practice-based research in the field that examines the reality of strategic implementation through a project portfolio (Clegg et al., 2018) and reveals the connections between practices, organizational learning and change (Brunet, 2019). In addition, Klessova et al. (2020) require more empirical research to understand the processes that influence knowledge integration in the context of innovation projects.

In this paper, we describe an empirical study of how a public organization took the initiative to reduce the total cost of its construction projects. The cost of a project is a complex issue and is influenced by many factors. However, it is essential in all types of projects, because it can be decisive in investing as a whole, the portfolio level is even more complicated when choosing between project options. How can PBO sustainably reduce costs at this level? As public organizations organize most of their activities in temporary organizations to carry out project tasks (Lundin and Soderholm, 1995; Hobday, 2000), they must transfer successful project practices to subsequent projects (Sydow et al., 2004).

Based on the results of a strategic initiative, what actions can organizations take to effectively utilize the results?

This article draws on theories from the field of organizational sociology to advance project management theory. It identifies the challenges facing public building strategic initiatives as they attempt to transform learning from a temporary organization to a permanent one. One specific contribution is to clarify the role of construction projects in a strategic initiative. To the authors’ knowledge, this aspect has not previously been highlighted in the project management literature. In addition, the study aims to extend Willems et al. (2020) of the effect of autonomy from strategic initiatives to results to a sustainable organization, adding to it a project-based organizational perspective. Based on empirical data, a framework was created for the implementation of strategic project profitability measures in a permanent organization.

2 Theoretical background
2.1 Cost performance of public construction projects
Project costing is a popular topic in the field of project management, and various aspects of this topic have been widely studied. A search for "project" and "cost(s)" only in the title, abstract or keywords of the International Journal of Project Management returns 412 articles published between 1983 and 2021 (Scopus search, 17 April 2021). These articles focus primarily on the individual project as a unit of study and examine factors such as cost estimation, cost development, cost overruns, and/or other factors affecting project costs. Cost effectiveness can be measured by two important components:

1. the increase in costs from a baseline (estimate) to final costs, or
2. costs per unit of work performed, usually measured either in square meters or in other units, such as the number of students (Sullivan, and others 2017).

2.2 Strategic initiative and portfolio management in PBOs

Grundy (1998) recommended strategic thinking in project management not only at the project level but also at the portfolio level. In their bibliometric study, Artoo and Wikstrom (2005) discovered the importance of strategic management of a resilient organization. They found that organizational theory and value creation logic influence the development of PBO. Strategic management at this level must be related to the internal and external context in which the project portfolio is managed (Martinsuo and Geraldi, 2020; Martinsuo, 2013). Participating in strategic initiatives at the portfolio (Martinsuo and Geraldi, 2020; Chinowsky, 2000) and aligning the project portfolio with the company’s strategic goals (Paquin et al., 2016) can complement a business strategy (Grundy, 1996; Shenhar, 2004). This notion is confirmed by Kopmann et al. (2017) who, in their study of 182 companies, suggest that strategic management at the project portfolio is important for the successful management of emerging strategies in an organization. Similarly, Dietrich and Lehtonen (2005), in their study of how strategic intent is managed in the context of multiple projects, argued that the objectives of strategic initiatives must be aligned with the organization’s strategy. Success factors for strategic initiatives include the implementation of a single project management process or project model that works on both the single and multiple project levels.

3 Methodology

3.1 Action research

Action research is "a type of applied research that aims to find the most effective way to bring about a desired social change or solve a practical problem, usually in collaboration with research subjects." (SAGE, 2019). The goal is "both to change the system and to produce critical knowledge about it" (Susman and Evered, 1978, p. 586). Rather than a single theoretical research method, action research is applied research that combines theory and practice to create a solution (Azhar et al., 2010). It is a method of "introducing change (or "action") and critically understanding that change to create new knowledge ("research") in the social environment (Sexton and Lu, 2009, p. 1). 688). A unique aspect of action research is the participatory and democratic process in which research is conducted not by participants but with participants, allowing them to participate in research and knowledge creation (Dick and Greenwood, 2015; Reason, 2006).

3.2 Methods and analyses

As part of a strategic initiative, the first author organized meetings to engage participants in collaborative cost-effectiveness initiatives. "Creation is a joint, collaborative, simultaneous, equal-level process of producing new value, both materially and symbolically" (Galvagno and Dalli, 2014, p. 644). The researcher and project managers used the meetings to develop and discuss cost-effectiveness measures. Lindhult (2019) calls such collaboration "democratic dialogue", recognizing that everyone involved in research, both academics and practitioners, has a significant capacity to produce knowledge.

3.3 Validity and relevance of the chosen methodology

Action research assumes a messy reality where research is a process rather than a product (Law, 2004). Therefore, a variety of mixed methods that are heterogeneous and based on the research setting must be used. Because this type of positioning research is contextual, the research result may not be replicable in other settings. So, the validity of action research is that those tools are used in the best possible way [i.e. research methods] within the confines of the workplace” (Somekh, 1995, p. 341). High-quality action research produces significant practical wisdom for the organization using research methods that allow the study of multiple (interactive) determinants of action. This deepens therapists’ understanding of complex situations and enables them to make more informed decisions. However, this confusion makes it impossible to draw a clear line between research material and work.
information. Therefore, interpreting the results in the light of previous practical knowledge can be problematic (Reason, 2006).

4 **The results of the strategic initiative**

This section provides an overview of the strategic initiative, its dynamics, results and challenges during and after the initiative. Special attention is given to the post-initiative challenges of implementing cost-effectiveness measures in a sustainable organization.

![Fig. 1. Template of the project value card on the topic of standardization.](image)

4.1 **Co-creation of actions for cost reduction in ‘value meetings.**

The key activity that emerged during the initiative was the direct participation of construction projects in the strategic initiative. As an interactive way to collect and produce cost-effectiveness measures in projects, 75 so-called value meetings with more than 100 project managers and other construction project employees. The researcher had a dialogue with the project managers, focusing on the specifics of the project. Figure 1 shows the normative value map model. The inner circle of the model contains facts about the subject: how it is measured, possible actions and how the strategic initiative can support the construction project. During the meeting, the planned activities and their intended effects were listed in a table on the map. The outer ring could later be used to summarize the real impact of activities and e.g., consider the amount of savings achieved by the measures.

Conducting "value meetings" in connection with each project was a very positive experience both as a pedagogical activity that promotes the identification and implementation of savings measures in construction projects, and as an implementation tool. The initiative acted as a catalyst for the continuation of cost efficiency measures in construction projects.

4.2 **Immediate results of the strategic initiative**

The final report of the strategic initiative states that the initiative was an important start in implementing a strategic approach to achieve cost efficiency in construction projects. The long-term impact of the strategic initiative's activities remains to be seen, as most of the projects involved are still in the implementation phase. Other projects were too far advanced during intervention to establish effective cost-effectiveness measures. The status of the cost target in the strategic initiative decision was as follows: The average final cost (baseline) of the project portfolio completed in the years 2010-2018 was 98% of the cost estimate at the time of the construction decision. Additionally, while the final cost of completed projects in 2019 improved slightly to 97%, the outlook for ongoing projects returned those costs to 98%. Most medium-sized projects achieved lower costs than before the initiative, but larger projects showed cost increases.

4.3 **Challenges in the strategic initiative**

At the beginning of the strategic initiative, the team and the leadership group discussed whether a simple strategy could be a 20% budget reduction for each project. The idea was not popular with project managers, who were sceptical of cost reduction per se. Therefore, an approach of applying specific cost-effectiveness measures to individual projects was adopted. In order to find a level of cost-effectiveness and develop effective resources,Changing the focus from the term "cost reduction" to the more positive term "cost-effective value creation" contributed to a better reception of the strategic initiative. This was also reflected in the name "value matches" and the term "cost efficiency" instead of "cost reduction". The purpose of the meetings was to find initiatives that could maximize the value of construction projects without increasing costs - or create activities that would save costs without reducing value.

5 **Discussion**

5.1 **An enhanced analytical model**

Measures of cost effectiveness in the organization partially reflect the factors found by Flyvbjerg (2005) and Klakegg et al. (2018) or collected by Doloi (2013) and Adam et al. (2017), in particular the view that project costs are largely determined in the early stages of the project. The objectives of the strategic initiative were aligned with the organizational strategy (Dietrich and Lehtonen, 2005), and the strategic aspects of the initiative led to the adaptation
of the future organizational strategy. The initial top-down strategy implemented by top management was later completed with a top-down approach (Himme, 2012),

Then we explore how a temporary strategic initiative becomes a permanent organization. Modeling the elements important to implementation can help us structure the important factors and provide guidance to other organizations planning to implement strategic initiatives.

The model consists of five main dimensions:

- "Structure (defined roles, responsibilities and authority in the formal organization, defined procedures, regulations, and working requirements);
- technologies (different tools and infrastructures the members of the organization use or are dependent on to perform their activities);
- culture (language/concepts, values, attitudes, norms, knowledge and established “ways of working”); interaction (management, leadership, work processes and information flow connected to communication, cooperation, and coordination); and
- social relations and networks (the informal structure and the social capital of the organization, i.e., trust, friendship, access to knowledge and experiences, informal power, alliances, competition and conflicts)."

The core of the model is characterized by a continuous interplay of these three elements:

1. organizational strategy,
2. organizational capabilities and performance, and
3. learning and knowledge transfer.

6 Conclusions

In the previous chapter, we have discussed the results of this study. In the following paragraphs, we will present the study’s contribution to both theory and practice and discuss the validity of the study as well as suggestions for further research.

6.1 The study’s contribution to project management knowledge

This study adds to the project management literature by providing a rich empirical account of a strategic cost efficiency initiative in a project-based organization that has not been previously addressed in the literature. Applying an organizational sociology perspective to the initiative shifts the focus from individual projects to the portfolio as a unit of analysis. The observed dynamics of the strategic initiative is in line with previous research on the need to think through action in implementing changes (Stensaker et al., 2008). It also adds a project-based organizational dimension to Willems et al. (2020) on how the autonomy of strategic initiatives affects the realization of results in a sustainable organization.

6.2 A research contribution to practice

This study is action research inspired by a "real life" problem: a contribution to practice is therefore inherent. The strategic initiative example provides guidance to project management professionals on how organizations can focus on cost effectiveness (see activities listed in Annex 1). This study emphasizes both cost efficiency measures in construction projects and specific measures for organizational development. Participants are asked to repeat the interactive approach to cost efficiency initiatives with project teams. The approach also includes including the cost reduction target in key performance indicators (KPIs) and strengthening the communication of cost efficiency measures. Microlearning and other communication methods can also be used to create a culture of cost efficiency. It is recommended to continue using the cost-cutting KPI introduced during the strategic initiative.

6.3 Validity of the research and suggestions for further research

This research project uses an action research approach in a single organization, which assumes high internal validity and practical relevance to that organization. However, methodological rigor is limited by researcher triangulation and the methods developed during the research to adapt to the dynamics of the organizational context. In addition, the fact that the researcher worked in the organization and acted as a facilitator in the meetings could cause biases in the research. All this said, generalizability to other strategic initiatives may be limited.

Further research in other organizations or different methodological approaches than action research, preferably using researcher triangulation, are recommended to verify the results.
References


