Organizational Learning to Unleash Creative Capacity of Contractors

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Publication date
2017

Document Version
Final published version

Citation (APA)
Tromp, E., & Bots, P. (2017). *Organizational Learning to Unleash Creative Capacity of Contractors*. 143-145. Abstract from 7th International Conference on Flood Management 2017, Leeds, United Kingdom.

Seventh International Conference on Flood Management (ICFM7)

5 - 7 September 2017

“Resilience to Global Changes - Anticipating the Unexpected”

University of Leeds, UK

Book of Abstracts

Oral Presentations

75. Organizational Learning to Unleash Creative Capacity of Contractors

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KEYWORDS: Organizational learning, Innovations, Flood Defences

ABSTRACT

In the Netherlands, technical innovations for dike strengthening rarely become mainstream. A case study of the redesign process of the dike between Kinderdijk and Schoonhovenseveer suggests that benefitting from the creative capacity of contractors requires organizational learning.

In 2001, the Dutch National Water Authority *Rijkswaterstaat* stimulated the development of innovations to improve dike stability with minimal impact on the physical environment. By means of a competition aimed at stimulating creativity of contractors, three techniques were selected for further development: *soil anchoring* (SA), *dike core blunging* (DCB) and *expanding columns* (EC). During a six-year period, *Rijkswaterstaat* largely subsidized the R&D of the involved private parties. An independent committee advised that, after small and medium scale tests, full scale testing was required to gain experience.

All three techniques were expected to become best practices after an experimental application in a full scale test. However, strong institutions delay the uptake of innovative techniques: Dutch regional water authorities (RWAs) normally publish their call for tenders with a detailed technical design (including estimates of required materials and construction time), projects are subject to formal review, and contractors bear all risks.

In 2008, severe vibrations felt during a conventional dike reconstruction project led RWA *Rivierenland* to pilot-test DCB and EC in two 100 meter dike segments, hoping that the experience gained in these pilots would warrant full-scale application to 10 km of dikes needing reconstruction, between Kinderdijk and Schoonhovenseveer. To better understand how knowledge transfer and uptake took place during the pilots, we analysed both processes using a fine-grained sender-receiver framework (Tromp & Bots, 2016).

In the DCB pilot, consortium X was contracted under a best-endeavours obligation. The DCB technique had already been applied successfully in the construction sector, and procedures and mechanisms to ensure safety had been validated there. The contractor worked in close concert with the RWA and the formal reviewer. The parties trusted each other, collaborated as equals, and

brought the innovation as far as project constraints permitted. This meant that the dike core blunges were constructed in a different manner due to field experiences. Despite caution, this caused damage to the surroundings and required further improvement of the technique. The DCB technique is currently successfully applied in with different project characteristics.

In the EC pilot, consortium Y was contracted under a performance obligation. They also interacted closely with RWA and reviewer, but the process was quite different. For the relatively more innovative EC technique, no validated safety approach existed yet. Elaborating this approach led to an iterative knowledge development cycle in which answers induced new questions and knowledge needs. In view of the performance obligation contract, consortium Y became very apprehensive about time and budget constraints and expected deliverables. Not knowing where and when the knowledge development process would end, they felt that RWA and the formal reviewers behaved like Eric Carle's 'very hungry caterpillar', and would be insatiable in their knowledge need. This loss of trust led consortium Y to take a reactive stance, which made the other parties – feeling that they had to do all the work – lose trust in consortium Y.

Despite this loss of trust, all three parties had strong incentives to carry on with the pilot. Consortium Y remained optimistic about the applicability of EC and the potential returns on their own investments in developing this technique. The RWA still believed in the additional benefits of the EC technique. Moreover, they knew that their financial risk was covered by guarantees from the National Water Authority. The reviewer felt that the knowledge developed so far warranted the risk. Eventually, the contracted target of expanding columns set in the dike segment was reached. Although here, too, damage to the neighbouring houses was greater than expected, the experience gained allowed consortium Y to upgrade the EC technique. Although Y decided not to tender for the full-scale project between Kinderdijk-Schoonhovenseveer, they later performed a second pilot – again in collaboration with the RWA, but on a different site – to test the refined EC technique. More recently, consortium Y successfully applied it to another dike under the RWA's jurisdiction. The technique is presently considered almost best practice.

If we interpret our observations on knowledge development, transfer and uptake in the two pilots in terms of team learning and organisational learning (Easterby-Smith & Lyles, 2011), we see a lot of substantive team learning, both within and among contractor, RWA and reviewer.

Organizational learning occurred mainly during the ex-post process evaluation of the pilots. This made the RWA realize that the type of contract does matter when the aim is to stimulate innovation. After reviewing alternatives developed for road infrastructure, the RWA adopted as policy to tender for projects using Design-and-Construct contracts, favouring consortia that can provide the RWA and its formal reviewer detailed information on their innovations. The linked stages in D&C contracts allow contractors to develop knowledge early on, reducing the uncertainty that clashes with performance

obligation.

Adopting this policy meant that the RWA had to develop the competence needed to tender on the basis of functional requirements instead of technical specifications. The policy also leads the RWA to periodically consult the private sector to discuss risk allocation, and gain support for new types of procurement guidelines. When tender documents for a particular dike strengthening project comprise innovations, the RWA also installs a special committee that is to advise the RWA on whether the innovation is applicable to this project.

The experience gained with this new variant of integrated contracts lead to application of several integrated contracts at other dike reinforcement projects, while further unleashing the creative capacity of contractors.

During project implementation between Kinderdijk and Schoonhovenseveer, the RWA learned that widening the scope for dike reconstruction projects can help discover synergies between dikes and their surroundings, and also that public participation can help improve the overall quality of an area, and provide opportunities to develop more sustainable solutions. The RWA is more open-minded and therefore continues its organizational learning efforts, resulting in different contracting and public engagement approaches in their current projects.

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