QUALITY AND INNOVATION IN PUBLIC PROCUREMENT OF RAILWAY INFRASTRUCTURE MAINTENANCE

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ABSTRACT

Quality management and innovation support each other and can, therefore, be integrated with each other. Quality management tools often require standardization of work or production processes, e.g., to find and eliminate wastes. Standardization is also positively linked to incremental innovation since the organizations understand their work-processes better. However, the same standardization may also be negatively correlated with radical innovation. For organizations to be successful, there is a need to support both radical and incremental innovation, called organizational ambidexterity. Feedback and learning from previous experience together with supporting leadership is important to stimulate organizational ambidexterity. This study uses the case of railway infrastructure maintenance within the Swedish Transport Administration (STA). STA has since its formation put more emphasis on creating innovation among its contractors. In 2013 the STA changed its procurement procedure of railway infrastructure maintenance. The intent was to stimulate innovation among its contractors. This study explores the result of this change and the possibilities for supporting innovation by public procurement of railway infrastructure maintenance.

INTRODUCTION

From the perspective of total quality management (TQM), the subject of innovation can be easily adopted into the subject field, as quality management (QM) could be a trigger for innovation (Cole and Matsumiya, 2007). The problem with innovation within TQM arises when organizations standardize their processes as it puts restraints on radical innovation (ibid.). However, Kim et al. (2012) also concludes that QM practices does stimulate both radical and incremental innovation, but only if all aspects of QM practices are stimulated and not just a few. There is, therefore, a need for managers to understand organizational ambidexterity to support both radical and incremental innovation (O'Reilly and Tushman, 2013, p. 324). Organizational ambidexterity is described as "the ability to simultaneously pursue both incremental and discontinuous innovation … from hosting multiple contradictory structures, processes, and cultures within the same firm" (ibid.). Organizations need to be open to new ideas and new knowledge, therefore ambidexterity is increasingly important for organizations (Steiber and Alänge, 2013).

Public procurement of railway maintenance is common choice in many European countries. The hypothesis behind public procurement of maintenance is that the quality levels of the railway system coukd be maintained but that private companies could do it a lower cost (Odolinski and Smith, 2016). Quality of railway maintenance can be described by RAMS; reliability, availability, maintainability and safety, four aspects that have to coexist. In 2013, the Swedish Transport Administration (STA) changed its procurement strategies to motivate contractors to be more innovative. The contracts were standardized to have the possibility to compare contracts.

Abdi et al. (2014) studied contracts for winter road and railway maintenance through interviews and surveys. They concluded that there is dissatisfaction from the contractors' perspective with the all-year-round contract. Nash and Wolanski (2010) held a workshop with participants from 10 different countries in Europe on the subject of competitive tendering; they concluded

that public authorities need to be competent to have competitive tendering. The importance of asset knowledge within public authorities is supported by Too (2012). Espling and Olsson (2004) studied the effect of partnering through a case study within a procured railway maintenance contract and concluded that partnering was successful and increase the effectiveness of the overall contract. Eriksson (2017) studied the effect procurement strategies in construction projects on exploration and exploitation through a literature review and concluded that there is a need for co-development (i.e. partnering) in complex construction projects. Hence, partnering can be a facilitator for innovation within public procurement of railway maintenance.

This paper seeks to understand the possibilities for innovation within public procurement of railway infrastructure maintenance. The paper is divided into five sections. Section one describes a theoretical perspective. Section two explains the methodology. Section three presents the findings, and section four discusses the findings. The last section presents the conclusions of the paper. The research is based on interviews with practitioners from both client and contractor organizations.The conclusion is that knowledge transfer and feedback between and during contracts is lacking, i.e. there is no organizational learning. Through feedback, good incentives can be designed that stimulate partnering and innovation within railway infrastructure maintenance.

THEORETICAL PERSPECTIVE

Different aspects of public procurement of railway maintenance need consideration: contract theory, the law of public procurement and organizational ambidexterity.

CONTRACTY THEORY

The contract is an agreement between firms or individuals (Abdi et al., 2014). A common problem in contract design is the introduction of moral hazard for the contractor, meaning that the client has to design a contract that both produces incentives but also prevent moral hazards in the form of loopholes that the contractor can use. One way to reduce the moral hazard is through partnering, as it can be included in any type of contract (Abdi et al., 2014; Borg and Lind 2014). Espling and Olsson (2004) describe partnering as "a managerial approach used by two or more organizations to achieve specific business objectives by maximizing the effectiveness of each participant's resources." Borg and Lind (2014) state that partnering can be used in any contract. Empirical studies within public procurement of railway maintenance have also found partnering useful (Espling and Olsson, 2004; Abdi et al., 2014).

Competitive tendering also affects contract design. Kadefors (2005) concludes that competitive tendering increases the risk of conflicts. Ultimately, trust and cooperation will suffer due to the conflict risk. Eriksson and Westerberg (2011) studied the effect of procurement procedures on project performance and concluded that cooperative characteristics have a positive impact on project performance. However, they also stated that the characteristics need to be nurtured together through communication and knowledge exchange between partners to be successful.

LAW OF PUBLIC PROCUREMENT

The law of public procurement (LOU 2016:1145) regulates competitive conditions and transparency during a public procurement process. The Swedish legislation to maintain these conditions was enacted when the country entered the European Union. However, practitioners disagree on how to interpret the law, especially when procuring at the lowest cost (Abdi et al., 2014). The law contains some important points:

- The tenders should be open to all firms, no matter what EU country the firm resides from, and
- What is to be procured must be in proportion to the actual requirements.

Only what can be measured or estimated can be procured which has received criticism as the law restraints how incentives can be designed (Tadelis, 2012). Private companies thus have more freedom and flexibility when designing contracts then public organizations. The difference in freedom is perhaps obvious, but it reduces what public organizations can learn and copy procurement methods from the private sector. Tadelis (2012) concludes that the public sector needs an enhancement of the procurement process tools. Abdi et al. (2014) present empirical evidence that procurement is through the lowest price, putting less emphasis on more soft parameters and concluded that the law of public procurement is seen as an obstacle by both client and contractor.

INNOVATION & ORGANIZATIONAL AMBIDEXTERITY

O'Reilly and Tushman (2013, p. 324) describe organizational ambidexterity as "the ability to pursue both incremental and discontinuous innovation… from hosting multiple contradictory structures, processes, and cultures within the same firm". Incremental innovation is existing technology for current customers, and discontinuous innovation (or radical innovation) is a new technology for a new customer segment (Benner and Tushman, 2015). For an organization to be ambidextrous is described as paradoxical, because innovation activities focus on different and often conflicting areas (ibid.). Quality management is often focused on standardizing work processes and activities (e.g., ISO 9001 or lean production) and therefore supports incremental innovation (Cole and Matsumiya, 2007). Standardizing brings process related issues to the surface and makes them more tangible to deal with (ibid.). However, the same standardization emphasizes work effort on either the standardizing itself or incremental innovation, causing a negative correlation to radical innovation (Adler and Borys, 1996; Cole and Matsumiya, 2007). Cole and Matsumiya (2007) and

O'Reilly and Tushman (2013) have conducted literature reviews on organizational ambidexterity and concluded that there is such a paradox and describe organizational ambidexterity as increasingly important for organizations to achieve innovation. Benner and Tushman (2015) support this finding through empirical studies.

Leadership could be a solution to this paradox, because of the enabling or coercive effect it has on innovation (Adler and Borys, 1996). However, old habits often prevail, and managers do not pass the innovation responsibility to the employees (Adler and Borys, 1996; Benner and Tushman, 2015). The awareness of managers' role as "power source" towards employees' empowerment is therefore the most contributing factor for organizational ambidexterity and innovation management (Adler and Borys, 1996; Benner and Tushman, 2015; O'Reilly and Tushman, 2013).

Feedback and learning is also considered important for innovation management (Steiber and Alänge, 2013). Leaders need to create a culture of learning and make it a part of regular work. Learning can come from internal experiences and external networks (ibid.).

METHOD

The data collection of this study is based on interviews with both the client and contractor for railway maintenance in Sweden. Two contracts were selected, and four persons per contract were chosen for a semi-structured interview to get a deeper understanding of how procurement of railway maintenance is done. The contract was also collected and studied to gain deeper insight in the interpretations that the different respondents had. Due to respondents that were either unavailable or that had quit their job, two interviews were not conducted, bringing the total respondents to six. All six participants have more than five years of experience in the subject field. The interviews were carried out between March and October 2017. The interviews were done at the interviewee's workplace except for one telephone interview. A template with key subjects was constructed to have a semi-structured interview and to be able to compare the answers between the respondents. The interviews were then transcribed and analyzed through Nvivo 11.

RESULTS

The results from the interviews were not divided into client and contract respondents and follow the interview template. Transcripts from the interviews were presented when the context was about how innovation or partnering was perceived or if they had any effect on the overall maintenance outcome. One of the standardisations made by STA in 2013 regarding procurement strategies was that partnering was supposed to be a part of the project, something that the respondents confirmed. However, the positive effect of partnering (see Espling and Olsson, 2004) was not perceived as beneficial:

> The project managers have not seen the benefits and are skeptical to partnering. They only see it as extra work that does not add anything. (Respondent 1)
>
> If I and my counterpart at the other company do not agree, then it does not matter if partnering is in the contract or not. There is no incentive connected to partnering. (Respondent 3)
>
> Partnering does not work in any railway maintenance contract in Sweden. (Respondent 4)
>
> If we can get partnering to work on all levels, then I believe that we can work more with innovation and development. (Respondent 5)

Transcript 1: Respondents opinion about partnering

However, partnering does exist in contracts and since both client and contractor have signed the contract, partnering should be used to some extent. The question then became what they make of it:

> We tried to use partnering in the beginning, with a workshop and some common objectives. However, with time it fell apart and disappeared. (Respondent 3)
>
> We had a consultant in the beginning to kick-start the partnering process. We had a workshop in the beginning and discussed what we both [entrepreneur and STA] wanted out of the contract. However, when the consultant quit, the partnering process disappeared with him. (Respondent 6)

Transcript 2: Discussion about the outcome of partnering

Contractor innovation is something that STA wants to stimulate. However, the innovation within railway maintenance contracts is something that has received less attention as the client has taken a more streamlined client role, rather than a project participant:

> Before the outsourcing, there were good examples of craftsmanship, but when we started taking the client-contractor relationship, it fell apart. Innovation in railway maintenance contracts is not, for example, a new smartphone but perhaps a new app to a smartphone. Today the workers do as the supervisor tell them. We need to trust the personnel working with railway maintenance more. They [the personnel], of course, need supervision, but there is no one better at the craft. (Respondent 3)

Transcript 3: Description of "what is innovation?"

The procurement is done by another, higher organizational level, and the project managers are consulted about different contract issues. However, the contractor and their experience are not used, and there is no knowledge transfer into the new contract.

> During the procurement procedure, there is no feedback from the existing contract about different aspects. It would have been better if we had feedback both from the project team but also the contractor. It is the project manager's responsibility to ensure that there is feedback. (Respondent 1)

Transcript 4: Feedback and knowledge transfer

DISCUSSION

Innovation in railway maintenance contracts involves developing internal work processes; how contractors perform the work and how procurement professionals design the contract. Hence, this type of innovation is performed by one of the parties of the contract, i.e. the contractor. One incentive for innovation is believed to be functional contracts, where the contractor is to deliver a functional level of the infrastructure described by, e.g., number of inspection remarks and faults, instead of just performing a number of predefined tasks. However, there are extensive restrictions on how the contractor should perform the work, e.g. regulations for inspections and predetermined maintenance, as well as what type of material and spare parts to use, but also limitations such as available possession time due to traffic. Hence, the degree of innovation is largely limited to logistic issues.

Partnering, if used correctly, has been presented as a way to enable innovation activities and is overall seen as beneficial in railway infrastructure maintenance (Espling and Olsson, 2004). Partnering involves both parties of the contract and is a way of close cooperation to obtain goals that are shared and agreed upon, but also to jointly work to reach these goals. The results of this study show that partnering is not used and that there is little room for innovation activities. Starting from the procurement process at the beginning of a new contract, no feedback is received from contractor project team and that the project manager from the client is only consulted. The internal lack of communication indicates that the new aspects of the upcoming contract are based on experience from the procurement employees rather than the personnel working with railway maintenance. The continuous learning between projects is, therefore, lacking.

The partnering process could be a solution to the lacking innovation possibilities. Partnering is to define common goals and interests for all interested parties. The findings suggest that partnering is used in the beginning and then forgotten as operations returns to the usual daily work. Partnering, therefore, needs more space in the everyday activities. It is necessary to realise that the distribution of work is moved from the traditional way of managing a task-based contract to more meeting for cooperation and communication to reach functional levels of the railway infrastructure. One way to do it is to have incentives and outcomes for the contract designed simultaneously. However, the law of public procurement state that firms must be treated equally. The equal treatment creates a problem for these partnering designed incentives because the winning firm would receive special treatment from the client for having an incentive that the other firms did not. Partnering must, therefore, be considered as early as possible in the procurement process since it cannot be added later.

The feedback and knowledge transfer is then something that could support the partnering process through organizational learning. A new procurement process should aim to choose contract design that avoid current problems and that meet maintenance needs that have been considered difficult to fulfil within the current contract. Contract incentives could be designed based on experienced project managers' knowledge about what is unique and different about the contract in question.

CONCLUSION

This study sought innovation possibilities within railway infrastructure maintenance. The result state that partnering is supporting towards innovation but is neither used nor seen as beneficial. Earlier empirical studies have concluded that partnering within railway infrastructure maintenance could be beneficial. For partnering, common goals are needed and incentives connected to those goals to create follow-up activities. Our research indicate that to design these incentives, project managers should transfer knowledge to the procurers. The involvement from project managers should be an important input when incentives are designed. Similarly, such involvement would, in turn, support partnering and innovation within railway infrastructure maintenance. However, more research is needed to determine if this is possible or not.

Another conclusion is that the law of public procurement is an obstacle for partnering in current contracts. There is room to design common goals, but there is no room to design incentives connected to those goals. There is a need for more research on the coupling between the law of public procurement and railway infrastructure maintenance.

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