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How task heterogeneity and frequency relates to knowledge codification: Evaluating the Shared Construction Guidelines (SCG) of 24 Swedish Public Client Organizations

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Abstract

Over a sustained period of time, organizational theorists have argued that public sector organizations are more inefficient than their private counterparts. Recent studies have explained these inefficiencies as the result of having to do with capabilities rather than resources thereby calling for an improvement of the capabilities of public organizations. A key mechanism for achieving such improvements is the articulation and codification of knowledge. This study examines an attempt at codifying knowledge in the form of a set of shared construction guidelines (SCG) employed by 24 large public client organizations in the Municipality of Gothenburg, Sweden. Specifically, these guidelines are viewed with respect to the framework of Zollo and Winter (2002) in terms of how organizations with high task heterogeneity and low task frequency can more effectively develop dynamic capabilities through the deliberate learning mechanism of knowledge codification. Preliminary results indicate that task frequency and organizational size are stronger indicators than heterogeneity in deciding whether a public client organization utilizes knowledge codification systems such as the SCG.

Keywords: construction guidelines, public organizations, construction clients, capabilities, knowledge codification

1. Introduction

It has long been argued that public organizations are less efficient than private ones (Brewer, 2011; Barton, 1980; Niskanen, 1971). A common explanation for this is the difference in the level of scrutiny that public organizations face. Services provided by public organizations are, in contrast to private companies, not put through competitive markets, which makes it difficult to evaluate whether these services were provided at an optimal cost. This incentivizes public organizations to overconsume and overproduce (Vining & Wiemer, 1999). Furthermore, unlike private companies, public organizations face stricter constraints on their operating routines. These restrictions govern aspects relating to recruitment, dismissal of employees and differential employee rewards, among others. These types of restrictions imposed on public organizations were introduced with the purpose of minimizing partisan politics, but as a side-effect has made it more difficult to generate incentives for the efficient use of organizational resources (Rainey, 1983; Elling, 1986; Vining & Wiemer, 1999).

A recent development, starting around the 1990's, was the attempt by governmental agencies to separate policy oversight of public service work into smaller more manageable bureaus (Otenyo & Lind, 2006). This development occurred against the backdrop of New Public Management initiatives which put public client organizations in a rather difficult situation: they were expected to do more with less, to increase performance but with fewer resources (Adukpo & Leiringer, 2016). This has led to reframing the challenges faced by public client organizations as having to do with capabilities rather than resources (Adam et al., 2017; Adam and Lindahl, 2017; Davies & Brady, 2016; Winch & Leiringer, 2016). Research on the topic of capabilities, and dynamic capabilities in particular, has been concerned with how organizations achieve competitive advantage by integrating, building, and reconfiguring their internal and external competences (Teece et al., 1997). Writing within the same school of thought as Teece et al. (1997), Zollo and Winter (2002) introduce a framework explaining how organizations can develop dynamic capabilities through the articulation and codification of their knowledge (into guidelines, manuals etc.). This framework stresses the importance of codifying knowledge even in cases where the activity/task being codified occurs on a rare basis. It is the framework of Zollo and Winter (2002) that is used in this study to examine the shared construction guidelines (SCG) developed by the second largest Municipality in Sweden, specifically with respect to how these guidelines conform to the two main hypotheses postulated by Zollo and Winter.

1.1 Overview of the Shared Construction Guidelines (SCG)

The Shared Construction Guidelines (SCG) represents a set of standardized guidelines of the construction process for the Municipality of Gothenburg in its role as a public client. The need for these guidelines was driven in parts due to the lack of conformity that had been identified in the operating routines of public organizations in the Municipality. The procurement and construction processes of the different public client organizations in the Gothenburg region had differed greatly. As a result of this, the city council decided that there was a need for a set of standardized guidelines that ensured transparency and conformity in the way these organizations operated. Transparency in particular had been a contentious issue due to a string of corruption scandals that had been uncovered in the year (2009) foregoing the decision to develop and implement SCG. Shortly thereafter, in 2011, the city council decided that public organizations within the jurisdiction of the Municipality were to develop a joint set of guidelines regarding the construction process. The development of these shared guidelines were to continue for the following two years leading up to an implementation phase beginning from

2013 which was concluded in late 2015/early 2016. At the same time an organizational unit developoing and managing SCG was established in 2011.

Although the corruption scandals created a sense of urgency for creating reform, the initial pretext for developing the guidelines had developed slowly in the years prior. The organization of the construction client function in the municipality had during the 1990-ies been distributed to several municipal organizations and companies. Much in line with NPM initiatives that sought to decentralize public organizations (Otenyo & Lind, 2006), the recession in the 90's lead to client organizations being downsized and split into different units, functioning primarily in an administrative capacity. Around 2005 there was a development starting towards first coordination of investments, leaving maintenance and FM still distributed. The background being an increased volume of investments in public projects. In 2007 a collaboration between a number of organizations related to both housing and civil works developed further as a network between the municipal organizations and companies was initited to manage exchange of knowledge and experiences from projects in order to to handle increased volume effectively. This served as a platform for the subsequent development work with SCG.

1.2 Detailing the SCG

The SCG is supported by a web-based documentation database that serves as a library that allows employees in client organizations to download documentation that regulates and supports how the construction process is implemented. The SCG enables quality-assurance of the building process for the Municipality's building departments that provides support and guidance in the implementation of the construction contract. The system allows for any client organization that operates under the umbrella of the Municipality to gain access to the city's collective knowledge, experience, tools and methods that relate to the construction process. Overall, the SCG sets requirements on the construction contract in the following manner: (1) The project is to be initiated with a purchasing order that clarifies scope, roles and responsibilities. (2) It is to be operated with the support of internal controls consisting of activities for various support and sub-processes. (3) It is concluded with a final report that enables for experience feedback to occur.

Additionally, there are requirements to provide documentation throughout the lifespan of the project. These ordinates are to be considered mandatory for all of the organizations that partake, notwithstanding minor deviations in the shape of customizations that may occur at the request of some of the organizations.

2. Method

This purpose of this paper is to examine the shared construction guidelines (SCG) employed by 24 large public client organizations in the Municipality of Gothenburg, Sweden. Specifically, these guidelines are measured against the two main hypotheses of Zollo and Winter (2002) in their study of how organizations develop dynamic capabilities through deliberate learning mechanisms. The hypotheses are stated as follows:

Hypothesis 1 (H₁)

"The lower the frequency of experiences, the higher the likelihood that explicit articulation and codification mechanisms will exhibit stronger effectiveness in developing dynamic capabilities, as compared with tacit accumulation of past experiences."

Three types of mechanism of building capability is mentioned here: explicit articulation, codification and tacit accumulation of past experiences. It stands to reason that the more frequent the members of the organization experience a certain task/activity, the more capable they become at mastering that task/activity. The opposite could be said about the inverse statement, the less frequent one deals with a particular task/activity, the less capable one will be in handling that task/activity. Given this, Zollo and Winter (2002) then argue that although one is less capable of executing a task that is performed infrequently for all three mechanisms of building capability, the codification of knowledge becomes comparatively more important than knowledge articulation which in turn becomes more important than tacit experience accumulation. The less frequent the organization's members face a specific task, the less able they are on relying on instincts or developing a tacit understanding of how that task could be dealt with. For infrequent activities, relying on codified knowledge becomes increasingly effective relative to other mechanics for developing capabilities. This counterintuitive proposition runs contrary to conventional managerial practice where only frequently reoccurring activities are codified and activities that occur rarely are handled in an ad-hoc manner.

Hypothesis 2 (H₂)

"The higher the heterogeneity of task experiences, the higher the likelihood that explicit articulation and codification mechanisms will exhibit stronger effectiveness in developing dynamic capabilities, as compared with tacit accumulation."

Similar to H_1, this hypothesis states that there are differences in how effective mechanisms for developing capabilities are depending on the nature of the activities. For H_2, Zollo and Winter (2002) postulate that the higher the level of heterogeneity of tasks, the more important knowledge codification as opposed to knowledge articulation and tacit experience accumulation. If the organization only deals with a limited number of activities, it becomes easier to develop capabilities to handle these activities through informal means and tacit accumulation. Conversely, when the task heterogeneity is low, it becomes redundant for the organization to codify their knowledge.

2.1 Documentation

The study draws primarily on reports issued by the Municipality of Gothenburg detailing the use of the SCG as well as the actual SCG database with routines, tool and documentation. The primary data consists of the documentation provided by the Municipality and its SGC management team which highlights the details of the SCG, the reasons for initiating it and its implementation by the Municipality's public client organizations. Included in this documentation are the SCG guidelines, feasibility studies, reports, thesis work, annual reports, and procedural documentation.

Specifically, a report containing an evaluation of the guidelines issued by the Municipality through its SCG management team was used to assess the level of compliance that the 24 organizations that employ

the SCG had with the issued guidelines (GBP, 2016). The level of compliance for each of the organizations were then analyzed in accordance with the framework of Zollo and Winter (2002). The organizations were categorized with respect to their type, size and how heterogeneous their operational activities were and how frequent they dealt with activities relevant to the SCG. The level of heterogeneity of activities and frequency of activities that relate to the SCG was determined by assessing their annual reports in terms of how many different activities the organizations described and how frequent they procured construction projects that needed to comply with the SCG. The result of this assessment is shown in Figure 1.

3. Results and Discussion

An evaluation of the 24 organizations showed great variation in how the organizations were actually adhering to the SCG. The different organizations represented and their level of compliance with the SCG is illustrated below, figures showing turnover and type of organization (area it operates in) has been added.

Table 1: The 24 evaluated organizations: their type, turnover and compliancy with the SCG.

Client organization	Type/Area	Turnover 2015 [MSEK]	Heterogeneity	Frequency	Compliant with SCG
Bostadsbolaget	Public housing	1662	Low	High	Partly
Egnahemsbolaget	Public housing	186	Low	High	Partly
Familjebostäder	Public housing	1298	Low	High	Partly
Fastighetskontoret	Property owner	385*	Low	High	Partly
Framtiden Byggutveckling	Property owner	2	High	High	Partly
Got Event*	**Property owner**	**157**	**Low**	**Low**	**No**
Grefab	Property owner	56	Low	High	Yes
Gryaab	Infrastructure	341	Low	Low	Yes
Gårdstensbostäder	Public housing	195	Low	High	Yes
Göteborg Energi	Energy	6191	High	High	Partly
Göteborgs Hamn	Property owner	715	Low	High	Partly
Göteborgs Spårvägar*	**Infrastructure**	**1106**	**Low**	**Low**	**No**
GöteborgsLokaler	**Property owner**	**209**	**Low**	**Low**	**No**
Higab	Property owner	701	High	High	Partly
Idrotts- och föreningsförvaltningen	Property owner	136	Low	High	Partly
Kretslopp och vatten	Infrastructure	1261	Low	High	Partly

Liseberg	Property owner	1139	Low	Low	No
Lokalförvaltningen	Property owner	900	High	High	Yes
Park- och naturförvaltning	Property owner	171	Low	Low	Partly
Parkeringsbolaget	Property owner	433	Low	Low	Partly
Poseidon	Public housing	1993	Low	High	Partly
Renova	Energy	1140	High	Low	Yes
Trafikkontoret	Infrastructure	1693	Low	High	Partly
Älvstranden Utveckling	**Infrastructure**	**361**	**Low**	**High**	**No**

* *Data from the year 2014.*

Of the 24 organizations listed, only five stated that they comply with SCG in all matters whereas fourteen stated they complied in most cases. Furthermore, 17 organizations utilized the ability to customize the parts of the SCG that deals with controls, of which eight organizations exclusively used a customized procedure for internal controls (*egenkontroll*). This is however not surprising as there is a clause in the SCG directives that enables for customization. However, what is not acceptable according to the directives of the SCG is to completely disregard internal controls which is what three organizations chose to do. If the customization of a particular clause leads to lessening a requirement or activity, this is referred to as an aberration (*avsteg*) which the SCG allows for only in cases where that particular requirement is not relevant to the organization in question.

The effect of *size* on compliancy

The average (mean) turnover of the selected organizations was 935 million SEK (MSEK), of those organizations that complied fully with the SCG the average turnover was 526 MSEK and 594 MSEK for those organizations that did not comply suggesting that smaller organizations (i.e. with less turnover) would either adopt the new construction guidelines entirely or refrain entirely. The organizations that complied fully and those that did not comply with the SCG had a median turnover lower than those that complied partly (1202 MSEK), it is interesting to note that the relationship is not linear in that those that partly complied with the SCG were bigger than the rest.

The effect of *type of organization* on compliancy

No relationship could be distinguished between the type of the organization and its compliance with SCG. For all four categories mentioned (property owners, infrastructure, public housing companies and energy) the level of compliance varied between the organizations. This suggests that the SCG has been framed in a generalized way that does not seem to favor one type of organizational type over another. It may also suggest that allowing certain customizations of the SCG made it possible for organizations working in different areas to comply with its requirements on an equal footing.

The effect of task *heterogeneity* and *frequency* on compliancy

According to Zollo and Winter (2002), a high level of task heterogeneity and a low level of task frequency means that knowledge codification is more effective as a learning mechanism compared to knowledge articulation and tacit experience accumulation. By excluding the organizations that partly complied with the SCG and instead evaluate only those 10 organizations that either did not comply at all or that complied fully, it then becomes possible to assess if task heterogeneity and frequency affected their choice for complying. The relationship between knowledge codifications (i.e. compliance with the SCG) and task heterogeneity/frequency is illustrated in Figure 1.

Frequency

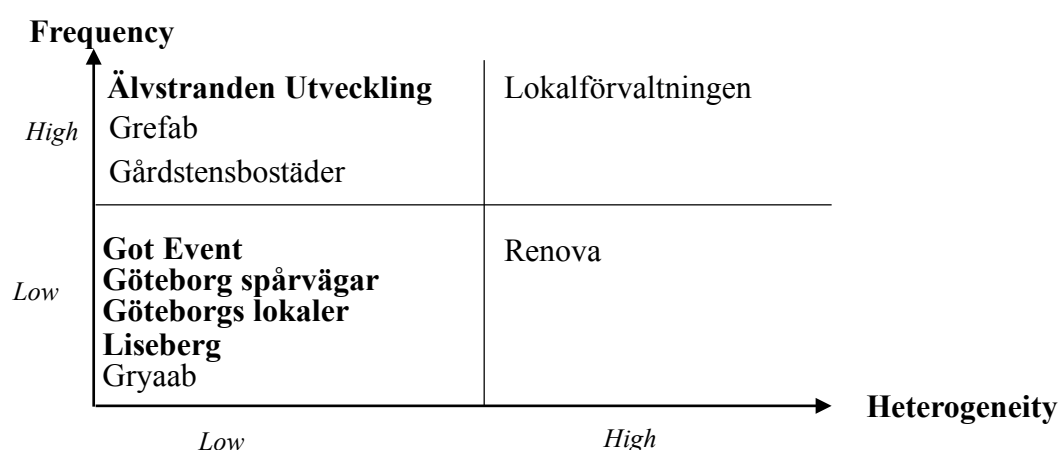|		
High	**Älvstranden Utveckling** Grefab Gårdstensbostäder	Lokalförvaltningen
Low	**Got Event** **Göteborg spårvägar** **Göteborgs lokaler** **Liseberg** Gryaab	Renova
	Low	*High*

Heterogeneity

*Figure 1: Showing organizations that did not comply with the SCG (**bold text**) and those that did comply in terms of their level of task heterogeneity and task frequency.*

It would seem that the level of task heterogeneity of an organization is not a strong indicator for whether that organization chooses to work with knowledge codification, in this case the SCG. For the organizations listed above, it would seem that a low task heterogeneity was typically the norm for those organizations that complied with the SCG as well as those that did not. However, task frequency was a much stronger indicator for organizations that did not adopt SCG fully– in that all but one organization had a low level of frequency of tasks that relate to the SCG.

4. Concluding remarks

The relatively small percentage of organizations that complied with the SCG poses a significant challenge that risks undermining the initiative itself. If these guidelines are to be shared as the name implies, they need to be followed uniformly by all of the organizations that purport to adhere to it. A key purpose of the SCG was to provide quality assurance for the way in which public client organizations in the Municipality procured and managed their construction projects and to set a transparent baseline for what is considered acceptable. In order to do so, the initiatives needs to be accepted across the board.

In describing the unsatisfactory results gained when assessing the 24 organizations, the issuer of the report refrained from offering any definitive explanation as to why so many organizations had not

adopted it thoroughly. The report excludes the possibility of this having to do with having insufficient time to adapt to the new guidelines. They support this by citing cases of certain organizations that introduced SCG much later than the other organizations and still managed to do so completely within that shorter time span. We may also exclude that this is due to a perceived lack of usefulness of the SCG seeing as an overwhelming majority (92%) regarded the initiative as useful. If this is the case, why would they then not adopt it? We offer here the possibility that it may have had something to do with the perceived easy of use. Davis (1986) state that in order for a new digitalized solution to be adopted in an organization, two independent conditions need to be fulfilled: a) the members of the organization need to perceive the new solution as useful and b) they need to perceive it as easy to use. In the case of SCG, the results from questionnaire show that they did indeed perceive it as useful but the report says nothing about the perceived ease of use. Knowledge codification is a double-edged sword in that it provides a mechanism for developing organizational capabilities but in doing so it also risks creating organizational inertia especially if the codified guidelines are perceived as complex and difficult (Zollo & Winter, 2002).

Going forward, it would seem that task heterogeneity is not a strong indicator for whether public client organizations pursue knowledge codification as a learning mechanism. It also suggests that the area in which the organization operates is less important than the size of the organizations with respect to the codification of knowledge. Particularly if the routines for codifying knowledge are described in a generalized fashion that allows for customizations to occur. Finally, among organizations that did not comply with the SCG a low level of task frequency seemed to be prevalent. This runs contrary to the recommendations of Zollo and Winter (2002) who argue that organizations that have a low task frequency would benefit more from codifying the knowledge relating to those activities than those organizations that engage in such activities on a frequent basis. The results would seem to agree with the notion that among the public client organizations that were studied, the conventional approach of disregarding knowledge codification for activities that are infrequent seems to be the norm. Due to the small section of organizations studied, it is not possible to emphatically state that the relationship between frequency, heterogeneity and knowledge codification is as it has been described in this paper. Further studies would be needed to determine if for instance the organizations that infrequently engaged in activities relating to the SCG would actually benefit greater by complying with the SCG than those that engage in those activities frequently, as predicted by Zollo and Winter (2002).

From further evaluations in the SCG in 2017 it is stated that the number of organizations complying is increasing, but thet there is a follow up on organization by organization in order to achieve this (ref). Adaptation and complying with rules is a challenge and needs time, especially in organizations whose success is rated by output ratio, budget and time adherenace such as the construction sector.

What can be said, however, is that approaches to knowledge codification, such as the SCG, provide a systematic way for public organizations of various sizes and types to work with similar routines. This marks a significant step forward for making sure that public organizations function in a more efficient and transparent fashion. The remaining challenge is to find a level of balance for the degree to which these organizations follow codified routines. The goal being to share the same systematized way of working and thereby avoid ad-hoc behavior while at the same time making sure the codified routines are not too stringent and overbearing or hinder innovation. The real challenge lies, most likely, in establishing a knowledge based approach where jdugement and decisions are supported by routines and guided by evaluation, documentation and

References

Adam, A., & Lindahl, G. (2017). Applying the dynamic capabilities framework in the case of a large public construction client. *Construction Management and Economics*, 1-12.

Adam, A., Josephson, P., & Lindahl, G. (2017). Aggregation of factors causing cost overruns and time delays in large public construction projects: trends and implications. *Engineering, Construction and Architectural Management, 24*(3).

Adukpo, S. E., & Leiringer, R. (2016). Client Project Governance Capabilities: Unpacking the Concept and Governance Mechanisms in Practice. *Proceedings of the 32nd Annual ARCOM Conference*, (pp. 165-174). Manchester, UK.

Barton, A. (1979). A diagnosis of bureaucratic maladies. *American Behavioral Scientist, 22*(5), 483-492.

Brewer, G. (2011). Parsing public/private differences in work motivation and performance: An experimental study. *Journal of Public Administration Research and Theory, 21*(3), 347-362.

Davies, A., & Brady, T. (2016). Explicating the dynamics of project capabilities. *International Journal of Project Management, 34*(2), 314-327.

Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly, 13*(3), 319-340.

Elling, R. (1986). Civil service, collective bargaining and personnel-related impediments to effective state management: a comparative assessment. *Review of Public Personnel Administration, 6*(3), 73-93.

Niskanen, W. (1971). *Bureaucracy and representative government* (2007 edition ed.). London, UK: Transaction Publishers.

Otenyo, E., & Lind, N. (2006). New Public Management and Reforms . *Research in Public Policy Analysis and Management: Comparative Public Administration: The Essential Readings, 15*, 501-514.

Rainey, H. (1983). Public agencies and private firms incentive structures, goals, and individual roles. *Administration & Society, 15*(2), 207-242.

Vining, A., & Weimer, D. (1999). Inefficiency in public organizations. *International Public Management Journal, 2*(1), 1-24.

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization science, 13*(3), 339-351.