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This is the accepted, refereed and final manuscript to the article published in

***International Journal of Project Management*, 30 (2012) 8: 865-876**

Publisher's version available at <http://dx.doi.org/10.1016/j.ijproman.2012.02.002>

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The Governance of Knowledge in Project-Based Organizations

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Abstract

This research investigates patterns of knowledge governance practices in project-based organizations (PBOs). Five propositions about knowledge governance in PBOs were deductively and empirically tested using qualitative data from 82 interviews. The results were triangulated with those of prior studies. Results indicate that knowledge governance practices in PBOs are impacted by structural and situational factors, such as being a subsidiary or standalone PBO, a PBO striving for excellence or not, as well as some preconditions, such as the executives' competence in project governance. The results show that informal governance mechanisms are more useful than formal when it comes to knowledge creating processes. Governance of informal knowledge creating mechanisms appear to be complex for executives and their preconceptions showed either to be enablers or barriers to productive knowledge governance practices. Executive's competence and preconditions, concerning aspects like human capabilities and attitudes to professional ethos, seems to impact knowledge governance strategies. In subsidiary PBOs knowledge governance provides practitioners with proper assistance to avoid unbeneficial situations of having knowledge silos among loosely coupled islands.

Keywords *Knowledge governance, project-based organizations, project-oriented organizations, knowledge management, end-users*

1. Introduction

The rise of knowledge management as an important issue for long term survival of organizations has created the need to govern the knowledge management efforts in organizations. Knowledge governance involves “... *choosing organizational structures and mechanisms that can influence the process of using, sharing, integrating, and creating knowledge in preferred directions and towards preferred levels.*” (Foss et al., 2010, p. 456) Knowledge governance mechanisms are either formal or informal. Formal mechanisms include deployment of information systems, reward systems, decision rights etc. while informal mechanisms comprise culture, networks and communities of practice (Foss, 2007). The concepts of knowledge governance emerges hereby as an attempt to steer knowledge management efforts by combining the macro-organizational (group) level with the micro-organizational (individual) level (Foss, 2007). However, research in both areas is unbalanced. Foss et al. (2010) reviewed research conducted on the relationship between governance issues and knowledge processes and found a gap, both theoretically and empirically. The empirical scarcity of knowledge management governance was also emphasized by Kannabrian and Pandyan’s (2010).

Corporate governance and knowledge governance have traditionally been two distinct units of analysis with different interests (i.e. focus on shareholder respectively stakeholders) and perspectives of, for example, knowledge (Keenan and Aggestam, 2001; Krafft and Ravix, 2008). Recent research on corporate governance have shifted to be more stakeholder oriented (Thiry and Deguire, 2007). The distinct views of knowledge, thus, still remain. Krafft and Ravix (2008) argue that corporate governance theories view knowledge as information that easily can be transferred while knowledge governance views knowledge as localized, specialized, dispersed and dynamic. Despite these distinctions, Krafft and Ravix (2008) and Keenan and Aggestam (2001), try to combine the two units of analysis mainly through advocating that knowledge governance shapes the corporate governance mechanisms. The corporate governance perspective is often based upon Transaction Cost Economics (TCE) (Williamson, 1995), while for example the knowledge based-view of the firm (Simon, 1991; Kogut and Zander, 1992; Nonaka, 1994; Grant, 1996b) is an outgrow of the Resource Based Theory (Penrose, 1959) which sees knowledge as the most important resource in a firm (Grant, 1996b).

Nickerson and Zenger (2004) develop this theory further by including elements from transaction cost economics like hierarchies and opportunistic behavior. The subjects are thereby partly integrated. Knowledge governance is claimed to be an established body of analysis (Krafft and Ravix, 2008), however, there is room for development. For example, if different governance practices are suitable for different subunits or the impact of different organizational forms are rarely discussed. Thus few examples exist, such as Scarbrough and Amaeshi (2009) who developed a model for knowledge governance challenges in open innovation projects; Bosch-Sijtjema and Postma (2010) explore governance factors as enabling knowledge transfer in inter-organizational development projects; and Lindkvist (2004) investigates a R&D organization and discovered that the governance was distinct from traditional bureaucratic organizations. This, even though, knowledge management theories have reflected upon the need to adjust strategies after organizational characteristics, like structure, membership and relationship (see for instance (Magnier-Watanabe and Senoo, 2008)). The stressed importance of structural impact differs among researchers. Van den Bosch et al. (1999) advocate that the organizational structure of an organization impact internal knowledge processes while, for example Foss et al. (2010) believes that the structure does not provide a direct impact. In summary it can be said that these studies add-up to a fragmented view of the subject, which calls for a more comprehensive investigation.

1.1 Impact of organizational structure

Internal knowledge processes have been found scarce in functional, matrix and project-based organizations (Hobday, 2000; PMI, 2004) inclusive. Functional organizations are found to be knowledge silos (Prencipe and Tell, 2001), matrix organizations to be inefficient in identifying and creating value out of existing knowledge (Van den Bosch et al., 1999) and project-based organizations (PBOs) to consist of isolated islands in a loosely coupled system (Orton and Weick, 1990; Lindkvist, 2004). Additionally, many 'modern' organizations are in fact a combination of the before mentioned structures, often labeled composite organization (PMI, 2004).

PBOs are defined as organizations in which the majority of products or services are produced through projects for either internal or external customers. The PBO may hereby be a standalone organization or

a subsidiary of a larger corporation (Turner and Keegan, 2000). Thiry and Deguire's (2007) adoption of PBO includes both the project-based and project-led organizational forms proposed by Hobday (2000). We assume that both the temporality of projects and the particular charter of projects, as an agent for change (in the sense of Turner and Müller, (2003)), provide a context of individual semi-autonomous projects in need for integration at the organizational level, however, at the risk that the attention towards short-term organizational goal achievement distracts from knowledge integration efforts. We thereby find it valid to propose that, in order to understand how knowledge governance practices have emerged, there is a need to take different perspectives into account due to the structural complexity of PBOs.

From the above we identify the following research question: *What are the mechanisms behind knowledge governance practices in PBOs?*

More specifically, the purpose of this research is to investigate if common patterns exist behind knowledge governance practices in PBOs. We investigate this through examining the implications for PBOs concerning (1) governance of knowledge creating processes; and (2) knowledge governance in intra- and inter-firm relationships. The unit of analysis is the relationship between knowledge governance practices and mechanisms behind them. The research context is the real estate sector in Australia and includes both standalone and subsidiary PBOs. This contextual setting is rather unexplored and needs further investigation as much research in the construction industry, in where the real estate sector is part of, focus solely on the contractor side (Jones and Lichtenstein, 2008) neglecting the client (real estate organization). Even though the client plays an important role in the sector (Widén et al., 2008). In the UK, a client led revolution has been noticed, but the quality of client performance often is poor, characterized by for example short-term thinking and uninformed decisions (Cole-Colander, 2003). This scarcity has also been found in studies in the Swedish real estate sector (see for instance (Lindahl and Ryd, 2007; Pemsel and Widén, 2010; Pemsel et al., 2010; Pemsel and Widén, 2011)). This research combines previous findings set in the real estate sector in Sweden and Finland to investigate the subject further as it provides contextual opportunities for extending the existing body of knowledge.

The paper continues with the related literature review, from which five propositions are developed. The subsequent methodology chapter describes the research design and methods used to test these propositions. This is followed by the analysis of the empirical findings. The paper finishes with a discussion and conclusion on the results

2. Literature review

In line with the research question the following review addresses the three categories of knowledge governance literature:

- Governance of knowledge in organizations
- Governance of knowledge creating processes
- Governance of knowledge in inter- and intra-organizational relationships

2.1 Governance of knowledge in organizations

Nickerson and Zenger's (2004) knowledge based theory focuses on problem-solving skills required for a task and its connection with appropriate governance styles in order to generate knowledge in organizations. They discovered three distinct governance choices in supporting knowledge formation: market (when directional search is needed to solve a problem), authority-based hierarchy (vertical communication channels, for decomposable problems) and consensus-based hierarchy (horizontal communication channels, for non-decomposable problems that needs heuristic search) (Nickerson and Zenger, 2004). Decomposable problems require hereby only low levels of interaction between individuals with different knowledge sets whereas non-decomposable problems require high levels of interaction (Nickerson and Zenger, 2004; Foss, 2007). They are mainly concerned with mitigation of risk for opportunistic behavior and focus on knowledge generation in firms. Thus, Hoetker and Mellewigt (2009) argue that TCE is most appropriate for formal governance mechanisms (i.e. business plans, reports, economic efficiency calculation etc.) in alliances. They emphasize the need for relational governance mechanisms (i.e. steering committees, project groups, expert committees and face-to-face meetings at top-management level etc) when dealing with knowledge-based activities (i.e.

knowledge of marketing and know-how, planning networks, customer care etc.) in alliances (Hoetker and Mellewigt, 2009). Kannabrian and Pandyan (2010), thus, advocates the need of formal governance in planning and implementation of knowledge management strategies and a designated committee to which knowledge management initiatives are reported and reviewed. It therefore seems reasonable to advocate that PBOs needs both formal and relational governance mechanisms but adopts a significant number of relational governance mechanisms when managing knowledge-based activities. This as project-based companies are characterized by having dynamic boundaries and contexts, a culture of empowering its staff, close interaction with customers and a high degree of team work (Huemann et al., 2007). The PBO's capability to develop strategies for managing social contexts and relationships in diverse projects have been found vital for its ability to learn and become competitive, due to the significant degree of embedded knowledge in projects (Sense, 2004; Sense, 2007). Moreover, many project based firms are multifaceted as they act in different sectors and markets, have different customers, products and services, number and size of projects and are incorporated in different institutions (Whitley, 2006). They therefore need different coordination mechanisms. Whitley (2006) categorized project based organizations by their uniqueness of products and services and their predictability of roles, tasks and expertise over projects. This is supported by Turner and Keegan (2001) who found that governance control processes in PBOs are impacted by size and number of projects respectively clients. Keenan and Aggestam (2001) combined corporate governance theory with human resource theories on knowledge issues, for instance, the combination of intellectual capital theory with corporate governance theory. van Ees et al. (2009) attempted developing a behavioral theory of corporate governance. These streams indicate an enhanced need for viewing knowledge as dynamic and localized and not simplified and reduced to information. A study showed that project managers in PBOs tends to easily report aspects related to time, budget and technology but resist when it comes to documenting lessons learned, evaluations of leadership, customer care, that is, existing knowledge. These managers relied on personal networks and arm's length activities for these endeavors (Pemsel and Wiewiora, conditionally accepted January 2012). Due to the tacit component of know-how knowledge it is often not effective (technically capable, in the sense of (Grandori, 2001)) to capture the knowledge in explicit documents. Based on that we formulate proposition 1:

Proposition 1: *Formal governance mechanisms are less effective than relational ones for knowledge governance practices in PBOs.*

The review above shows that more research is needed to understand knowledge governance mechanisms in PBOs. A review of previous research focusing on knowledge governance from (1) a knowledge creating process and (2) an inter- and intra-organizational relationship perspective, with PBOs in mind and the particular focus of PBOs in the real estate sector is presented in following sections. In the sense of Nonaka and Toyama (2005), we define the relation between knowledge creation vs. knowledge creating and individual vs. firm as follows: A firm can define the means and support for knowledge creating processes and activities; however, knowledge creation occurs through individual and collective interaction and reflection, which may be independent of such means and support.

2.2 Governance of knowledge creating processes

Polanyi (1983) observes that knowledge has both tacit and explicit dimensions as we can know more than we can tell. Cook and Brown (1999) argue that tacit knowledge is a tool for action needed for know-how, know-when, know-why etc. Polanyi (1983) considers the tacit and the explicit parts of knowledge to have different natures which cannot be converted into the other. Senge (2002) and Nooteboom (2004) find this valid due to the cognitive distance that exist between individuals. Nonaka (1994), however, advocates that tacit and explicit knowledge can convert into each other in a knowledge creating process consisting of: socialization, externalization, combination and internalization. Others have claimed that knowledge is rarely completely tacit or explicit, but contains elements of each, and that knowledge has to have both dimensions to be useful (Wong and Radcliffe, 2000). Knowledge from a cognitive and organizational perspective can be embedded (tacit and collective), embodied (tacit and individual), embrained (explicit and individual) and encoded (explicit and collective) (Lam, 2000). From this Lam (2000) proposes that different types of organizations (like bureaucracies or adhocracies etc.) are dominated by different kinds of knowledge due to their governance mechanisms and this results in different dynamics of learning and innovation in the organizations.

PBOs are struggling with creating knowledge processes between projects as well as between project and other subunits in the PBO, like marketing and real estate department (see for example (Pemsel and Widén, 2010)). This may be a consequence of incommensurability of knowledge types in different organizational forms due to for example high degree of embeddedness. That is, contextual understanding necessary to understand the knowledge, or proper use of knowledge governance mechanisms. The governance of knowledge, therefore, contains tacit knowledge, as well as the how, why and when of different knowledge mechanisms and their appropriateness for stimulating different knowledge creating processes. Grandori (2001) states that databanks are appropriate knowledge governance mechanisms for low complexity problems but if knowledge differentiation is added, actors need assistance of knowledge translators and disseminators. Moreover project based firms tends to focus on the outcome of knowledge processes rather than the process themselves (Prencipe and Tell, 2001).

Processes leading to knowledge creation or accumulation are numerous and have often been used interchangeably without clear distinction in previous research (Foss et al., 2010). Knowledge can be created in groups through two distinct processes with different antecedents and outcomes, namely; knowledge sharing and knowledge integration (Okhuysen and Eisenhardt, 2002). Previous literature has defined knowledge sharing as a problem solving process that consists of identifying and expressing the uniquely held knowledge (Hansen, 1999; Okhuysen and Eisenhardt, 2002). Knowledge integration also involves a process of sharing individual knowledge within the group but with the intention of combining it in order to create new knowledge (Okhuysen and Eisenhardt, 2002).

Knowledge integration is thereby a dynamic process since when, where and how the integration is conducted impacts on the knowledge created (Okhuysen and Eisenhardt, 2002; Söderlund, 2010) and is a part of the firms absorptive capacity (Van den Bosch et al., 1999). This is most likely valid for all knowledge processes due to the dynamic nature of knowledge as such. The distinction of knowledge sharing and integration and its precursors also question the validity of emphasizing either knowledge sharing or knowledge integration. Instead we argue, in line with Grant (1996b) and Grandori (2001), that the organization, through the top-management (or executives), need to be competent in managing

and governing both knowledge integration and sharing in order to achieve efficient knowledge management in the organization. We formulate proposition 2:

Proposition 2: *Knowledge governance mechanisms used in PBOs reflect executives' knowledge of antecedents for knowledge creation processes.*

Antonelli (2006) creates an extensive framework, based on TCE, that combines knowledge governance mechanisms with knowledge characteristics and forms of knowledge. Antonelli (2006) focus on technological knowledge and identifies three main knowledge governance mechanisms: (1) quasi-hierarchical command of tacit and sticky knowledge; (2) constructed interaction for articulable knowledge; and (3) coordinated transactions for codified knowledge (Antonelli, 2006). The three forms of knowledge are similar to Principe and Tell's (2001) learning processes: experience accumulation (i.e. learning by doing and using), knowledge articulation (learning by reflecting, thinking and confronting) and knowledge codification (learning by writing, implementing and adapting). Antonelli (2006) argues that tacit knowledge cannot be separated from individuals leading to a knowledge governance strategy that focuses on internal coordination. Governance mechanisms here are in-house outsourcing, technology platforms and joint ventures. Codified knowledge is often found in mature and stable fields and markets and has been found to play a central role for knowledge governance initiatives. This means that the organization explores external sources of knowledge and knowledge outsourcing becomes common practice. Articulable knowledge is a mix of tacit and codified knowledge and is a step in the process of codification. Network activities, standardization committees and technological clubs are effective knowledge governance mechanisms for articulable knowledge (Antonelli, 2006). Antonelli (2006) does not distinguish between different levels of analysis in the organization which Principe and Tell (2001) do when studying inter-project learning in project based firms. They divide the organization into three analysis levels: individual, group/project and organizational, and identify three distinct learning landscapes depending on the emphasis on learning mechanisms. Both Principe and Tell (2001) and Antonelli (2006) assume that tacit knowledge can be codified if right knowledge creating mechanisms are used and that it is desirable to do so. Principe and Tell's (2001) study highlights that organizations emphasis on individual, group

and organizational learning differs while Leidner et al. (2006) advocates that PBOs fosters individualistic rather than cooperative cultures, resulting in inhibited knowledge sharing. This may be due to the firm's dependence on the individuals' ability to self-organize their work (Lindkvist, 2004). Managers in PBOs often rely on their own experiences, that is, tacit and localized knowledge and the top-management often let them act autocratic and independent. Explicit documents, like lessons learned, guidelines and standards often are considered necessary but the usability of them regarded limited (Pemsel and Widén, 2011; Pemsel and Wiewiora, conditionally accepted January 2012). Whether this is efficient (cost effective) or not may be questioned but has implications for knowledge creating initiatives and we formulate proposition 3:

Proposition 3: *For PBOs to be efficient in knowledge governance, their knowledge governance mechanisms need to be adjusted to appropriate their learning landscapes.*

2.3 Governance of knowledge in inter- and intra-organizational relationships

Firms whose critical knowledge resource is embodied in human resources, like PBOs, should favor mutual learning and generation of new knowledge, though, this is not always the case (Grandori, 2001). Grandori (2001) discovers three main cognitive failures of knowledge governance mechanism; knowledge differentiation, complexity and conflict of interests. She argues that all failures need to be considered in a firm's knowledge governance mechanisms. The study proposes a multiple boundary view of the firm in-where the boundaries may include internal and external relationships. Brokering and intermediating functions become critical in order to manage knowledge differentiations and conflicts of interests. Swart and Harvey (2011) suggest that managing knowledge boundaries is beneficial as interfaces between organizations provide dynamic knowledge creation opportunities. In addition to that, Antonelli (2006) propose the need for vertical respectively horizontal coordination activities in firms to govern different knowledge creating processes. Knowledge generated through the synthesis of different knowledge modules is most effectively governed through horizontal mechanisms (Antonelli, 2006). PBOs are repeatedly found to be loosely coupled systems (Orton and Weick, 1990; Slater and Narver, 1995) and often use project management offices (PMO) to coordinate knowledge between project, program and top-management (Thiry and Deguire, 2007). A study of PMOs as a

knowledge broker in PBOs shows that PMOs have potential to act as knowledge broker internally if taking an active broker role and possessing expertise knowledge (Pemsel and Wiewiora, conditionally accepted January 2012), that is, both vertical and horizontal coordination. Another study found that PBOs benefit from using managers with well developed brokering capabilities (i.e. translating, interpreting, educating etc.) when interacting with customers and end-users (Pemsel and Widén, 2011). We formulate proposition 4:

Proposition 4: *Knowledge brokering activities are suitable knowledge governance mechanisms for managing knowledge differentiation and conflict of interests in PBOs.*

Knowledge creation is foremost an individual activity which firms use in the production of goods and services (Grant, 1996a). Foss et al. (2010) advocates the importance of understanding individuals' attitudes, motivation, goals, intention, behavior etc. to be able to explain knowledge processes in organizations. For instance trust, reputation and professional ethos are acknowledged important aspects impacting knowledge sharing and integration (Grabher, 2004). These three concepts are interlinked as reputation may positively impact motivation to share knowledge (Lucas and Ogilvie, 2006; Yang and Wu, 2008) and high levels of reputation may increase trust, both between individuals and professional/epistemic communities (Antonelli, 2006). However, actors are encouraged differently to share knowledge depending on relational and motivational factors (Boer et al., 2004) and, from a behavioral perspective, influenced by power plays and politics between coalitions (van Ees et al., 2009). A study of in-house knowledge sharing in PBOs revealed that project managers are independent and do not appreciate when other interfere or try to help, because it hampers knowledge sharing activities (Eskerod and Skriver, 2007). Project managers often prefer learning in personal networks of actors they trust (Eskerod and Skriver, 2007; Pemsel and Wiewiora, conditionally accepted January 2012). Relational-governance strategies are found emergent in PBOs in order to manage social and cultural barriers and attitudes among internal and external actors that also can hamper knowledge sharing activities. Articulated strategies to manage these relational aspects are primarily experience-based and individually held (Pemsel et al., 2010; Pemsel and Widén, 2011). Keenan and Aggestam (2001) emphasize intellectual capital (were attitudes and motivation is

incorporated) as embedded in people, structures and processes, which thereby is part of the corporate governance. Proper governance of intellectual capital is therefore essential for knowledge intensive organizations survival (Keenan and Aggestam, 2001). The study states that these aspects should be governed but it does not suggest how this should be accomplished. Wang et al. (2009) take a resource-based view of the firm and investigate relationship-based employee governance mechanisms. They propose that trusting relationships is a governance mechanism that encourages employees to invest and contribute in firm-specific knowledge activities. However, more mechanisms are needed, like the impact of motivation (especially from executives) on exploiting firm-specific resources (Wang et al., 2009). It is thereby evident that a comprehensive understanding of governance of relational aspects is currently lacking in the literature on knowledge governance and we formulate proposition 5:

Proposition 5: *Executives' relational governance impacts knowledge exploitation in PBOs.*

In summary we suggest that in order to understand the underlying mechanisms of knowledge governance practices in PBOs the practices need to be examined in relation to knowledge creating processes and intra- and inter-organizational relationships.

3. Method

The research takes a critical realism perspective in the sense of Bhaskar (2009), assuming a subjective reality, based on an underlying objective reality. The three layers of critical realism are hereby reflected in the underlying *mechanics* of objective knowledge management processes and policies, which give raise to their use in projects as *events* of possible knowledge integration, which, in turn gives raise to individuals *experiences* of adopting or avoiding knowledge creating processes in organizations.

A deductive approach is chosen for maximizing reliability and credibility in the results. The just presented literature review and development of the five propositions are based on existing literature and on results from earlier conducted studies (see 3.1 for further information). These five propositions are, in this study, empirically tested in a qualitative mono-method, cross-sectional study based on semi-structured interviews. This study's results are hereby triangulated with results from earlier

studies, in the sense of (Denzin, 2011). The support for the propositions is based upon the analysis of the collected data. If a majority of the respondents confirms the proposition it is regarded to be supported. If the propositions are supported but emerge to impact other aspects of knowledge processes or knowledge governance practices in the PBO these notions are remarked. This in order to improve the understanding of what mechanisms impact knowledge governance practices in PBOs.

3.1 Development of the data collection instrument

The data collection instrument was developed from a literature review in conjunction with four conducted and published studies, (i.e. (Pemsel and Widén, 2010; Pemsel et al., 2010; Pemsel and Widén, 2011; Pemsel and Wiewiora, conditionally accepted January 2012)), resulting in an interview protocol. The interview protocols for these four studies were developed and validated through four literature reviews, 18 workshops with practitioner and researcher from the Nordic countries, before used in altogether 82 semi-structured interviews. These studies were conducted from 2008 to 2010 in Sweden, Finland and Australia.

These four studies and a new literature review resulted in five theoretical propositions to be tested deductively in accordance with Saunders et al.'s (2009) recommendations. The interview protocol focused on three main themes aligned with the propositions namely what strategies real estate organizations use to ensure that their facilities support the needs of end-users, legislations and trend on the market; how they ensure that knowledge is shared and integrated between subunits in the organization; what boundaries they need to bridge to achieve intra-organizational knowledge creation both on an individual and an organizational level.

3.2 Data collection

Data were collected through 18 semi-structured interviews with 19 persons in 14 companies. The interviews were conducted in Queensland, Victoria and New South Wales in Australia. The intention with the survey was to investigate whether findings from the four previous studies are valid in another context since they were conducted in Sweden, Finland and Australia (but different sectors in

Australia). Every interview were recorded, transcribed and sent back to the respondent in order to let them validate the transcriptions.

3.3 Sampling approach

Data collection was done until theoretical saturation was reached, that is another interview would not bring anymore insight. The survey organizations were chosen after the following criteria:

- Manage construction projects
- Properties are their main service or product
- Having either excellent or poor performance concerning management of end-users and their needs

The interviewees were chosen in accordance with the following criteria:

- Represent different parts of PBOs and be involved in management of projects, or their managers, and end-users in conjunction with construction projects
- Belong to middle or top management in the organization and be aware of the strategies in the organization
- Have specialist expertise concerning the research subject

Table 1: Summary of the survey companies and the respondents

Company	Organizations role	Kind of projects and customers (Turner and Keegan, 2000)	Subsidiary or standalone PBO	Number of respondents and their role
A	provide service and coordinate projects	big projects – few customers	subsidiary	1 middle manager
B	provide service and coordinate projects	small projects – many customers	subsidiary	1 middle manager
C	provide service and coordinate project	big and small projects ¹ -few customers	subsidiary	1 middle manager

¹ The organization both provides big new facility construction projects and small refurbishment schemes.

D	provide service and coordinate project	big and small projects -few customers	subsidiary	1 top manager
				1 middle manager
E	sells services	small projects – many customers	standalone	2 middle managers
F	provide service and coordinate project	big and small project -few customers	subsidiary	1 top manager
				1 middle manager
G	develop, sale, lease	small projects – many customers	subsidiary	1 middle manager
				1 trainer
H	sells services	small projects – many customers	standalone	1 middle manager
I	provide service and coordinate project	big and small projects -few customers	subsidiary	1 middle manager
J	trader ²	small projects – many customers	standalone	1 middle manager
K	develop, coordinate projects and lease	small projects – many customers	subsidiary	1 top manager
L	provide service and coordinate project	big and small projects -few customers	subsidiary	1 middle manager
				1 expert
Outsider 1 ³	-	-	-	1 end user
Outsider 2	-	-	-	1 top manager

² Trader refers to an organisation that develops, construct and then sells facilities.

³ There are 2 outsiders among the interviewees that do not fit in to the above described criteria. One is a CEO for an institute for a certain kinds of properties in Australia. 90 % of the professional organisations are members in this institution. This institute has the end-users interest in mind and provide obligatory training for its organisational member and thereby act as an external knowledge sharing force to those organisations. The second outsider is an end-user to one of the organisations. The end-user was earlier working in a facility management organisation and is now the end-user organisation's internal project manager when interacting with company I. This interview was conducted in order to validate the interview conducted in Company I.

3.4 Data analysis

The transcribed interviews were summarized by company to get a more condensed and comprehensive understanding of each organization. Data analysis was done following Saunders et al. (2009).

Deductive pattern matching was used as analysis technique to identify support for the theoretically derived propositions. The interviews were coded and analyzed in several rounds into categories.

Analysis of categories identified patterns, relationships, characteristics, which were, or were not, in line with existing literature. Furthermore, the richness of the data allowed for identification of three mechanisms.

The analysis process searched structurally of explanations among the dependent and independent variables that builds up the propositions, that is, a constant comparison and testing between literature and empirical data. Through this process were mechanism and structures searched for that explained how the governance of knowledge creating processes as well as knowledge governance in intra- and inter-firm relationships had emerged within the sample-survey organizations. The process led to development of three mechanisms which jointly appeared to impact knowledge governance strategies and practices in PBOs in this study. It is possible that further mechanisms exist but they were not identified in this analysis.

4. Analysis

This section explores mechanisms behind adopted knowledge governance practices in PBOs in the search for support of the five propositions. The companies revealed distinct strategies for knowledge governance related aspects, illustrated by the two following citations:

“It’s tacit knowledge really. I guess we’re small enough... you know translating that type of background knowledge into a database becomes almost...it’s almost facile. What it really is about, the most powerful thing that you inculcate in a successful business is its culture. And its culture is underpinned by habit. You know, it’s really the way you do things around here and the way you do things around here is sharing knowledge. So we share it through forums, we share it through processes and systems and we share it through, just sort of day to day interaction.” (Company H)

“I don’t consider us as a learning organization, no. If you want people to learn new things it requires quite a lot of pushing. But once you have pushed it happens. Many people are quite happy just doing what they do and don’t want to extend themselves.” (Company B)

These quotes illustrate two distinct knowledge governance strategies that were commonly found in this survey. Companies striving for excellence when it comes to their products or service offers appear to have a culture of sharing knowledge, continuous development and inclusiveness. The employees have to adopt the culture and fit in otherwise there are unwelcome to stay, that is, the company has a demanding and clearly stated knowledge governance strategy. The other kind of company has an unconcerned view of knowledge governance; they think they are good enough as long as they are profitable. If they want things to happen they have to use a command governance style as the employees are, and prefer to be, self-governed. The companies’ objectives, goals, culture and size thereby impact adopted knowledge governance strategies in accordance with the citations above.

Nevertheless, every respondent emphasize a need to use relational activities, like face-to-face interactions and communications both internally and externally, in order to achieve knowledge sharing and integration. The formal governing mechanisms impact indirectly on executives’ ambitions concerning knowledge governance practices through the organization’s goals and objectives. The relational mechanisms emerge to be vital for knowledge creating processes. *“There is a desire and a strong passion to have the healthiest and most sustainable buildings that are the most attractive detective that is a strong focus for us... By getting people to work in teams...weekly and monthly meetings, workshops...and we constantly train people on the job. Bringing young people in to support the other members of the established team.”* (Company J) This confirms proposition 1, that is, PBOs benefit from using relational governance mechanisms. Thus, the refinement and use of relational mechanisms differ among the companies and its departments, this will be further analyzed.

4.1 Knowledge governance of knowledge creating processes

The most commonly used learning process found in this sample survey is experience accumulation. On-job-trainings, person-to-person communication and informal encounters were present in almost

every surveyed organization. *“There are things that you cannot really learn except that from being in that situation before.”* (Company J). However, organizations striving for excellence had a higher emphasis on knowledge articulation processes, like value management sessions and project control group meetings. Those formal sessions emerge to be necessary to achieve knowledge creating processes across departments in PBOs. In subsidiary PBOs communication most often needed assistance across departments to happen due to a high degree of knowledge differentiations and conflict of interests. Without assistance it was shown that differentiations tend to hamper knowledge creating initiatives. In standalone PBOs the degree of knowledge differentiations and conflict of interests are lower. The standalone PBOs are however also using a number of supporting and assisting knowledge articulation endeavors like brainstorming, reviews and lessons learned discussion sessions.

The value of training was regarded different among departments in subsidiary PBOs. Sales and marketing departments found training invaluable, they found it necessary to reflect, relearn and refine what they had learned by doing and using. In project departments this was often considered unthinkable. Project departments fosters a different learning culture in where the individual’s independency was much higher, that is, no interference. Thus, in the standalone PBOs project managers were less autonomous in their learning by doing through organized mentoring, working in pairs and training activities.

Codified knowledge was mainly used as a reference. Most executives found it necessary but not always easily used in practice. *“You often have a spoon of knowledge in a sea of information.”* (Company H). Individuals working with strategic questions however experienced codified knowledge more valuable. They used lessons learned documents and research reports frequently but mainly used them as a way to find contact information to the authors of the reports. The respondents expressed a need to get it interpreted and translated by the author, that is, they needed a contextual understanding of it to make use of it. Some respondents found that the employees were not capable in performing this self-evaluating and reflecting assignments. *“People see the value of learning and that is often more verbal than written...Not everybody working in projects necessarily have academic skills, writing*

skills or research skills.” (Company D). Others believed that nobody used evaluation documents and therefore did not emphasize these learning activities.

All together this implies knowledge governance mechanisms needs to be active, ongoing and supportive to achieve knowledge creating processes in PBOs on levels that are more advanced than experience accumulations. In companies with a laidback and non-strategic attitude towards knowledge governance, the individual experiences tended to be accumulations shared to those they had trustful relationships. This further implies that mechanisms behind the governance practices may not always bring out the most efficient practices but those that were accepted in a specific context. Proposition 3 is thereby supported: the companies adjust the governance practices to their learning landscapes, which can be regarded as efficient. But that may not always be the most effective strategy from an overall knowledge creating perspective. This implies that even though the organization adapts its strategies to their learning landscapes there is no assurance it becomes a learning organization.

The executives’ knowledge of antecedents to governance tends to be experienced-based and influenced by organizational routines and norms. The executives expressed the importance of enabling relational governance mechanisms to achieve knowledge creating processes. Knowledge was expressed to be integrated in projects, shared between colleagues and departments on an as needed basis and transferred via documents within the PBOs. The executives show they have some insight of antecedents for knowledge creating processes, which supports proposition 2. However, the use of them appears to be influenced by personal beliefs and attitudes towards human nature and different professional ethos. *“We have a customer relations department and they are people that are service orientated, who can say No with a smile on their face without people getting upset. Yes, very different types of people. They are very amiable and effable in contrary to the very driven and left brain dominant development managers.”* (Company K) and *“I mean, look there is no point in trying to be Elvis Presley if you cannot sing.”* (Company E). The efficiency of the application of their knowledge in the knowledge governance strategies can thereby be questioned and will be discussed in the following section.

4.2 Knowledge governance in inter and intra organizational relationships

Analysis shows that when interacting with end-users in projects a high degree of interaction is needed to understand their needs. The respondents describe this process as a non-decomposable problem in need to be solved. Companies striving for excellence use more consensus-based hierarchy governance strategies than those that are not. Companies believing they are good enough are characterized by a more laidback and reactive knowledge governance style. When problems occur the company uses a command governance style to make the employees adopt it. In the companies striving for excellence the knowledge governance strategy is also demanding, not on an *ad hoc* basis, but rather on an everyday basis: *“Well this is an unusual organization in that it doesn’t get you anywhere. So those behaviors won’t get you to the top, they’ll probably get you out the door.”* (Company F).

Additionally, when interacting with end-users, the companies used a number of brokering strategies. The companies acknowledge that they have to be skilful negotiators, interpreters and translators to succeed in their interactions with end-users. Some of the respondents have developed experience-based strategies for different end-user organizations as a way to bridge boundaries between the organizations more efficiently. *“We use sketches, 3D technologies, mood boards and visits to similar worksites... We adapt strategies to whether the client is informed or not, that is, have done it before or not... sometimes you have to hold people’s hands.”* (Company H).

However, when it comes to internal brokering activities the initiatives and presence of them differ. Every company acknowledges that differences exist among subunits in the organization. The subunits are regarded to have different levels of motivation to create new knowledge, different goals and time perspective, different pre-knowledge as well as willingness to participate in interactions with other units. *“The biggest challenge internally quite frankly is to get people to knowledge share.”* (Company F). This creates problems in the knowledge creating processes and the companies are aware of it, but the governance strategies to solve it differ. *“I find that the project manager is very open and the development manager is less so. And the property investment manager, the asset manager, is probably as protective... I try to encourage an atmosphere of openness and everyone, you know, is one big team here and not disrupt bunches of people... it is difficult sometimes.”* (Company F). Brokering strategies

thereby appear to be suitable knowledge governance mechanisms, which supports proposition 4 with the additional remark that the companies would probably benefit from a more strategic use of internal brokering activities, especially in subsidiary PBOs.

The executives' stories indicate they hold attitudes to professional ethos and the members within professions. This appears to affect the employees' ability to develop tasks and relationships. Some departments are regarded as unprofessional with customers, others as unwilling to learn and a third as egoistic and ignorant. Ignorance was also present among top and middle managers, for example, "*I know what they are thinking before they know and I tell them.*" (Company I). These attitudes come out to determine assignments given to that group of people. This may be contra-productive as the top and middle managers also believe knowledge not is enough shared or integrated.

Executives further believe the construction sector incorporates a lot of *brutal* (Company C, D, F, I and J) personalities and they avoid employing them if possible. As a consequence many of the companies striving for excellence are headhunting people. An individual's reputation thereby plays a significant role for that person's career. Almost every company uses a knowledge governance strategy of employing experienced and very motivated individuals. There is a naïve belief that employing persons with right mindsets automatically create knowledge creating processes. Moreover, some companies believe that motivation will remain without support and encouragement. In companies striving for excellence, thus, the executives give a more nuanced picture of how to keep up the motivation of its staff, through for instance, personal development plans and continually satisfy their hunger for development through more complex and demanding tasks. The executives' capability of relational governance practices thereby appears to impact the knowledge exploitation; supporting proposition 5.

Table 2 summarizes the empirical tests of the five propositions, which shows that all proposition were supported by the qualitative empirical data, except proposition 3, which is only partly supported.

Table 2: Summary of the propositions' support

Proposition	Supported/not supported	Comment
1	Supported	Formal mechanisms set the conditions through goals and objectives but relational mechanisms are indispensable for generate knowledge creating processes
2	Supported	The use of antecedents for knowledge creating processes is shown to be influenced by personal beliefs and attitudes towards the human nature and differences in professional ethos.
3	Partly supported	The research revealed that if knowledge governance was adapted to a learning landscape the knowledge creating processes can be efficient but not necessarily effective.
4	Supported	Brokering activities were strategically used with end-users and clients. Internal brokering strategies tend to be less often strategically used. But the companies using subsidiary PBOs showed signs of having a numbers of boundaries between departments and disciplines in need to be bridged to achieve more efficient knowledge creating processes.
5	Supported	Executives have potential to bridge social and cultural barriers and thereby achieve knowledge exploitation both internally and externally through strategic use of relational knowledge governance practices. Thus the executives' preconceptions towards actors can be enablers or barriers for this to happen.

5. Discussion

This research demonstrates the need to take a variety of perspectives into account in order to understand how knowledge governance practices emerge in PBOs. It is not enough to consider, for example, the three governance choices: market, authority-based hierarchy and consensus-based hierarchy as suggested by Nickerson and Zenger (2004). Neither to solely look at the learning landscapes discovered by Prencipe and Tell (2001) or Whitley's (2006) four classifications of PBOs. These studies provide a good start in differentiating between different PBOs and their knowledge governance practices, but a more holistic perspective is needed to accommodate contextual differences and integrate theoretical bases. Previous studies on knowledge governance theory are mainly based on TCE or resource based view of firm. Our research supports the simultaneous impact of both streams, but argues for a more integrated perspective to understand knowledge governance practices in PBOs.

Three of the most significant differentiators in knowledge governance practices found in this study are (1) whether the PBO is a subsidiary or standalone; (2) if the PBO strives for excellence or not and; (3) the executives' impact on knowledge creating processes.

5.1 Structural mechanisms

First, standalone PBOs often show more subtle knowledge governance practices than subsidiary PBOs. This may be because the former indict a higher project-focus than the latter, where project management is just one of many different business foci and thereby gains less attention, in line with Müller (2009). Top management appears to be too detached from subunits in subsidiary PBO to acknowledge more efficient knowledge governance practices. Subsidiary PBOs are composites of project-based and functional organizations, which results in both struggling from having isolated islands (Orton and Weick, 1990) and maintenance of knowledge silos (Prencipe and Tell, 2001), which may explain the less subtle knowledge governance practices, but at the same time stresses the need for them. Underlying *structural mechanisms* indicate to impact the knowledge governance practices in PBOs.

5.2 Visionary mechanisms

Second, this study suggest that goals and objectives of PBOs impact knowledge governance practices, in line with Whitley (2006). Present research reveals that PBOs striving for excellence in their product and service offers, try to foster a collaborative and inclusive culture in a sector characterized by individuality, for instance, valuing individual's reputation. This is partly contrasting to Leidner et al.'s (2006) finding that PBOs foster individualistic cultures. Remarkably in the standalone PBOs that can be regarded as the "purest" PBOs in present research, culture of collectivity was emphasized. The subsidiary PBOs not striving for excellence had the lowest ambition level for inclusiveness and collectivity. The result from this research thereby challenges the notion that PBOs always should foster an individualistic culture. Present research reveals that emphasis and interest of knowledge governance practices appear to be higher in PBOs striving for excellence, both in standalone and subsidiary, than in organizations aiming to be merely good enough. Underlying *visionary mechanisms* appear to impact knowledge governance practices.

5.3 Pragmatic mechanisms

Third, previous research on knowledge governance stresses knowledge sharing at group level forgetting the individual level (Foss et al., 2010). However, present research highlights executives' role in impacting knowledge governance practices through their knowledge of, and interest in, enabling knowledge creating processes in PBOs. The executives' strategies are mainly experienced-based, through trial and error and they express that informal governance strategies are more suitable than formal. The predilection for informal strategies may be founded in their belief in how human learn or lack of knowledge of how to make formal reward systems productive. The executives sometimes appear to be fumbling in the dark when it comes to identify proper practices to generate internal knowledge creating processes. The research indicate that they mix (1) naïve coping strategies, that knowledge creating processes will materialize automatically when employing the right people, with either (2) authoritative and commanding leaderships styles, or (3) coaching attempts to motivate and give the individual freedom to develop. Some of the executives emphasize the need to adjust strategies to every individual and group to achieve desired outcomes. This confirms Singh (2008) recommendation of adjusting leadership style to knowledge management activities to achieve productive outcomes. These findings support the notion that different governance strategies are appropriate for different subunits in PBOs. Additionally, it was found that the executives' preconceptions to human nature, individuals and professional ethos impacts adopted knowledge governance practices. A further research is encouraged concerning connections between knowledge governance outcomes and leadership styles. Thus, in present study *pragmatic mechanisms* appear often to foster knowledge governance practices rather than enlightened innovative mechanisms.

Overall, the analysis indicates that knowledge governance strategies need to consider both holistic and narrow perspective. Firstly, knowledge creating processes across units are often insufficient due to attitudes and lack of informal relational governance practices among subunits. Secondly, subunits are diverse and based on different cultures and appears to belong to distinct communities of practice (in line with (Corso et al., 2009)). This indicates the need for contingency in adjusting knowledge governance practices to subunits needs.

This research is the first empirical study in knowledge governance in the real estate sector in Australia. Previous studies are either theoretical, for example (Grandori, 2001; Keenan and Aggestam, 2001; Antonelli, 2006), or in other industries with different foci like alliances in telecommunications (Hoetker and Mellewigt, 2009), comparison between software and advertising (Grabher, 2004), implementation of a new organization within a manufacturing company (Lindkvist, 2004) and technological development projects in construction (Bosch-Sijtsema and Postma, 2010).

6. Conclusion

This research investigated patterns in knowledge governance practices in PBOs, done by examining the implications for PBOs concerning (1) governance of knowledge creating processes; and (2) governance of intra- and inter-firm relationships. The research took a deductive approach, developing five propositions investigated in a qualitative sample survey in the real estate sector in Australia. The five propositions were supported with some additional remarks of contextual aspects in need to be considered.

The mechanisms behind knowledge governance practices, from the two dimensions explored, in PBOs are:

- Structural mechanisms
- Visionary mechanisms
- Pragmatic mechanisms

These three mechanisms occasionally tend to be contra productive resulting in ineffective knowledge governance practices. This as executives seems to be fumbling in the dark concerning their use of leadership styles to generate knowledge creation processes. Keeping knowledge creating processes alive often requires ongoing active demand and support from executives, which is not always the case. It is indicated that underlying structures and preconditions impact adopted knowledge governance practices. These need to be understood to recognize how knowledge creating processes can be

improved in PBOs. The research implicates that knowledge governance practices in PBOs are impacted by subsidiary type, ambition level, and executives' competence and preconditions.

The managerial implications of this research indicate that generation of knowledge creating processes requires subtle interplays between commanding and enabling knowledge governance practices.

Additionally, to be efficient in knowledge governance, not only practitioners' preconditions toward professional ethos need to be managed but also those of executives. From a theoretical perspective this research contributes with a recommendation of adopting a comprehensive and contingency view of knowledge governance in order to understand underlying mechanisms behind knowledge governance practices in PBOs. The research results suggest that PBOs should use multiple knowledge governance strategies for different subunits due to the structural complexity PBOs.

The strength of this research is that it combines previous studies in a triangulating manner. The limitation of this research is its sample size, which limits generalizability of the results. However, the richness of the semi-structured interviews allowed for new insights which foster the need for further quantitative studies.

This research contributes to existing body of knowledge by suggesting a contingency theory perspective towards knowledge governance, where knowledge governance strategies are adjusted to organizational characteristics within PBOs in order to allow knowledge processes to prosper between subunits.

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