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MANAGING KNOWLEDGE REPOSITORIES: GOVERNANCE MECHANISMS AND THEIR IMPLICATIONS

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ABSTRACT
Two strategies, or governance mechanisms, widely employed to increase the value of knowledge assets in organizational knowledge repositories are: (1) expert (or hierarchical) governance, which employs experts or supervisors as referees to control or edit users' contributions; and (2) community governance, which relies on a community of users to review, rate, or edit existing contributions (such as in a wiki). The goal of this dissertation is to introduce the concept of repository governance to the knowledge management literature, and investigate the implications of these two alternative governance mechanisms on knowledge contribution to and knowledge use from electronic repositories. Three essays are discussed to achieve the goals of the dissertation.

Keywords
Governance, hierarchical control, community-governance, knowledge contribution, knowledge use

INTRODUCTION
The number of organizations that implement knowledge management (KM) systems to increase efficiency and effectiveness of organizational practices for competitive advantage is on the rise (Davenport, Prusk and Strong, 2008). In order for organizations to enjoy the benefits of these KM initiatives, knowledge repositories must provide high-quality knowledge assets (Pentland, 1995; Schuler, 1994; Wiig, 1997). Two of the most frequently used approaches to satisfying this need are: (1) using experts or supervisors as referees to control or edit users' contributions (such as in a refereed repository); and (2) using a community of users to review, rate, or edit existing contributions (such as in a community-driven wiki).

Drawing upon sociology literature, these two approaches can be referred to as expert-governance (i.e., hierarchical control), and community-governance respectively (Bowles and Gintis, 2002; Kooiman, 1999; Streeck and Schmitter, 1985). Although most knowledge repositories are governed using one of these two mechanisms, our understanding of them, and the concept of governance in general, is still rather limited in the context of KM. For instance, there is not much theoretical work that distinguishes between different forms of governance, or discusses the role of technology in instantiating them. Further, we have limited knowledge about how governance mechanisms impact salient behaviors in KM such as contributing knowledge to and using knowledge from repositories in organizations. The goal of this dissertation is to introduce the concept of repository governance to the KM literature, set its conceptual foundations, and understand how the governance concept impacts other salient research streams in the KM literature such as knowledge contribution and knowledge use. To achieve these goals, the dissertation is structured as three related but distinct essays.

This dissertation is expected to make important theoretical and practical contributions. From a broader perspective, it attempts to initiate a new research stream concerning governance of electronic repositories, and examines its implications on other research streams in KM. Further, it attempts to inform practitioners of alternative mechanisms that render knowledge assets more valuable in electronic repositories, and make suggestions on how governance mechanisms can foster knowledge contribution and use. The specific contributions of each essay are discussed in detail below.

ESSAY I
The goal of the first essay is to set the theoretical foundation of the dissertation, reduce any definitional and conceptual ambiguity, and set future research agenda about governance of repositories. In particular, conceptual clarity is sought in the following areas: how repository governance fits into the existing KM literature; different types of mechanisms to govern knowledge assets; the role of technology in instantiating governance mechanisms; differences between two most commonly used governance mechanisms in organizations (i.e., expert-governance, and community-governance); and the criteria (e.g., effectiveness, cost, etc.) that are salient for organizations and individuals to choose a governance mechanism.
The first essay makes important theoretical contributions to the existing body of research. The most salient of these is introducing the concept of repository governance to the KM literature. Since there is little theoretical work concerning governance of knowledge repositories, this essay is expected to start a new line of research in the context of KM. Research questions that emerge from this essay will not only advance our understanding of KM governance, but also help integrate this new concept with existing KM research. The research questions identified in the first essay are presented in Table 1, of which RQ10(a) and RQ11(a) are examined in Essay II, and RQ9(b) is examined in Essay III.

<table>
<thead>
<tr>
<th>RQ1</th>
<th>What are the conditions under which governance mechanisms ensure storing knowledge rather than information in organizational knowledge repositories?</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ2</td>
<td>What types of knowledge can be governed with what type of governance mechanism?</td>
</tr>
<tr>
<td>RQ3</td>
<td>What type of quality does each governance mechanism impact the most?</td>
</tr>
<tr>
<td>RQ4</td>
<td>(a) What other measures can be used to evaluate the success of governance mechanisms?</td>
</tr>
<tr>
<td></td>
<td>(b) What are the conditions under which governance mechanisms can maximize the quality of knowledge assets without compromising other success measures?</td>
</tr>
<tr>
<td>RQ5</td>
<td>What are the conditions under which expert and community-governance are more preferable over each other in increasing the quality of knowledge assets?</td>
</tr>
<tr>
<td>RQ6</td>
<td>What are the implications of a non-optimal choice of governance mechanism?</td>
</tr>
<tr>
<td>RQ7</td>
<td>What are the opportunity costs of using expert and community-governance?</td>
</tr>
<tr>
<td>RQ8</td>
<td>What are the conditions under which governance mechanisms deliver high quality knowledge assets in shorter amounts of time?</td>
</tr>
<tr>
<td>RQ9</td>
<td>What is the impact of governance mechanisms on (a) contributing knowledge to; and (b) using knowledge from organizational repositories?</td>
</tr>
<tr>
<td>RQ10</td>
<td>What factors are salient for users’ choosing between different governance mechanisms in (a) making contributions to; and (b) using knowledge from repositories?</td>
</tr>
<tr>
<td>RQ11</td>
<td>How do these factors impact individuals’ choice while (a) making contributions to; and (b) using knowledge from repositories?</td>
</tr>
</tbody>
</table>

**Table 1. Research Questions Identified in Essay I**

This essay makes important practical contributions as well. First, it informs practitioners of the not-so-well understood facets of governance mechanisms. This is important as implementing a repository due to management fads can impose a specific governance mechanism, of which the organization doesn’t have a good understanding. Second, this essay discusses the role of technology in instantiating governance mechanisms, enabling practitioners to manipulate certain features to implement the right governance mechanisms for their organizations.

**Literature Review**

An examination of the prior literature shows that the idea of governance is not entirely novel to the KM research. KM governance concerns the set of activities, policies, or procedures that control, coordinate, and facilitate knowledge management processes in organizations (Foss, 2007; Schroeder and Pauleen, 2007). Within KM governance, it is possible to further categorize studies into different groups according to their specific focus. One group of studies examines how firms can best govern knowledge transfer within and between organizations. Among the studies that focus on the governance of knowledge transfer within firms, Davenport and his colleagues (Davenport, 1997; Davenport, Eccles and Prusak, 1992; Strong, Davenport and Prusak, 2008) suggest that knowledge transfer is governed through power dynamics between organizational units. Among the studies that focus on the governance of knowledge transfer between organizations, it is suggested that knowledge transfer is governed through mechanisms such as social capital (Mu, Peng and Love, 2008), and markets, entitlements, and gifts (Choi, Cheng, Hilton and Russell, 2005).

A second group of studies investigates governance of KM efforts such as the development of KM strategies (e.g., Zyngier, Burstein and McKay, 2006), the roles of KM leaders (e.g., Chourides, Longbottom and Murphy, 2003), and the roles of community sponsors/facilitators (Lank, Randell-Khan, Rosenbaum and Tate, 2008).
The above studies inform us of different mechanisms for controlling, coordinating, and facilitating knowledge transfer; and recommend strategies on how to best manage KM initiatives in organizations. However, there is not much discussion on how to govern repositories and maintain knowledge assets in knowledge repositories. One exception is Neus and colleagues (Neus, 2001; Neus and Scherf, 2004), who discuss “traditional” and “collaboration-oriented” mechanisms as alternative ways to manage information in repositories, and suggest, based on observational and anecdotal evidence, that collaboration-oriented techniques (such as wikis) are superior for creating, sharing, and managing information than traditional expert-based systems. There is very little clarity in the concept of repository governance, or theorizing on how governance may influence key KM processes such as knowledge contribution or use. The following sections explore these “gaps” in the KM literature.

**Governance in the Context of KM**

Kooiman and Bavinck (2005) define governance as “the whole of public as well as private interactions taken to solve societal problems and create societal opportunities” (p.17). According to this conceptualization, governance can be considered “arrangements” (or mechanisms) that can solve problems faced by a group of individuals, collective, community, or society (Kooiman, 1999). The sociological literature informs us of many such arrangements, two of which are hierarchical control, and community-governance (Bowles and Gintis, 2002; Kooiman, 1999; Streeck and Schmitter, 1985). Hierarchical control represents the classical top-down approach between policy makers (i.e., state) and the ruled (i.e., citizens), in which state enforces rules and policies on citizens to provide services. On the other hand, in community-governance, citizens take care of themselves and solve problems through their autonomous and voluntary efforts rather than relying on state.

These two governance mechanisms are especially important for the purposes of this dissertation, because most knowledge repositories are governed by these two mechanisms. In other words, the “problem” of increasing the value of knowledge assets in repositories is predominantly solved using hierarchical control and/or community-governance. In the context of KM, hierarchical control corresponds to expert-governance, where experts or supervisors act as referees, and accept or reject individual contributions to a knowledge repository. If submissions are below par, experts may require authors to revise their submissions, or edit the submissions themselves before publishing them in the repository. Alternatively, organizations may employ community-governance, where a community of users may autonomously and voluntarily increase the value of knowledge assets by reviewing, rating, and editing existing content.

Expert-governance and community-governance being the central focus, the first essay provides a description of other forms of governance, and how governance mechanisms are instantiated in organizations. Due to space limitations, other salient concepts cannot be discussed in this document.

**ESSAY II**

The second essay concerns knowledge contribution, and examines the conditions under which individuals choose between expert or community-governed repositories in making their contributions. In other words, given two electronic repositories, one governed with expert-governance and the other with community-governance, this essay explains which repository individuals make contributions to and why. It is noteworthy that this essay assumes that individuals already decided to make a contribution, and studies the choice of governance mechanism in making the contribution. Therefore, the RQs of this essay are: (1) what factors are salient for users’ choosing between different governance mechanisms in making contributions to organizational knowledge repositories; and (2) how do these factors impact individuals’ choice?

This essay is motivated by the arguments provided in the current literature about the impact of governance mechanisms on individuals’ attitudes and behaviors. It has been discussed that the limitations of governance mechanisms, or their fit with the context in which they are instantiated can cause attitudinal and behavioral changes on the part of individuals (Adler and Borys, 1996; Bowles and Gintis, 2002; Streeck and Schmitter, 1985). This can also be true in the context of KM such that individuals can be more willing to make their contributions to repositories that employ a certain type of governance mechanism due to the fit between the mechanism and the KM context. However, current literature in KM neither considers governance mechanisms in explaining contribution behaviors, nor provides a set of factors that explain why individuals choose between governance mechanisms in making their contributions. Therefore, there is a need to first identify a set of endogenous and exogenous factors, and then explain the nature of their impact in making contributions to expert and community-governed repositories.

This essay has important theoretical and practical contributions. From a theoretical perspective, it attempts to develop a new theory that explains the conditions under which individuals choose between expert and community-governed repositories in providing contributions. This is important, because current understanding of contribution behaviors implicitly assumes that governance mechanisms do not influence contribution behaviors, for which the evidence states otherwise. Another salient
theoretical contribution of this essay is that it is expected to provide fresh insights to existing theoretical frameworks in explaining knowledge contribution behaviors in organizations.

From a practical perspective, this essay informs practitioners of why users choose to make their contributions to expert or community-governed repositories when both governance mechanisms are in place. However, practitioners who employ only one governance mechanism can benefit from this essay as well. In this case, practitioners can understand the extent to which users will make contributions to a repository, because individuals’ level of contribution can depend on the fit between their choice of governance mechanism and that of organizations. Ultimately, the findings can help practitioners identify the most preferable governance mechanism for their organization, and thus foster knowledge contribution.

**Literature review**

There is a large body of research in KM literature that tries to shed light on why individuals make contributions to knowledge repositories. This essay reviews this body of research using an input-process-output (IPO) framework, where output represents the dependent variable (i.e., contribution behavior), input represents the independent variables, and process represents the theories that provide an explanation as to why inputs are related to output.

Some of the processes identified in the literature include social capital theory (e.g., Wasko and Faraj, 2005), task-technology fit theory (e.g., Lin and Huang, 2008), collective effort model (e.g., Cosley, Frankowski, Kiesler, Terveen and Riedl, 2005), social exchange theory (e.g., Kankanhalli, Tan and Wei, 2005), and theory of planned behavior (and its variants) (e.g., Bock, Zmud, Kim and Lee, 2005). The inputs (i.e., variables) investigated using these theories and the nature of their impacts on contribution behaviors cannot be discussed in detail in this document due to space constraints.

One of the key insights provided by the IPO framework is that contribution behaviors are not solely determined by individual factors, but by organizational and technological factors as well. However, the IPO framework also reveals that current literature doesn’t take the role of governance mechanisms into account in explaining contribution behaviors. This is important for the purposes of this essay for two reasons. First, there exists a gap in the literature about the possible effects of governance mechanisms on knowledge contribution; and second, individuals’ preferences for governance mechanisms can provide fresh insights to the existing explanations of knowledge contribution in the literature.

**Theory**

The second essay espouses a theory building approach by first identifying the salient endogenous and exogenous factors to individuals, and then studying the impact of these factors on individuals’ choice of making contributions to expert and community-governed repositories. The theory building approach is specifically chosen for this essay, because the existing frameworks in information systems (IS) or governance literature cannot adequately explain the choice of governance mechanisms in the context of KM. This is because the contextual peculiarities of KM make it difficult to use an existing theory, and the lack of robust theoretical frameworks in the governance literature poses limitations to hypothesize a priori relationships. Therefore, this essay adopts an inductive approach for theory building by identifying the salient factors and understanding their impact on individuals’ choice of governance mechanisms in making contributions.

The study will be conducted within the light of the framework presented in Figure 1, which is developed through insights provided by governance and IS literatures. The benefit of using this framework over pure exploration is that it provides four clusters of constructs (i.e., knowledge, organizational, individual, and technological characteristics) as a starting point to identify some of the salient factors. The clusters and the constructs in each cluster are mostly informed by the IPO framework and the first essay. It is noteworthy that the constructs presented in Figure 1 do not constitute an exhaustive list, but only a representative sample. Having understood the salience of these (or any other) constructs, a new research model will be developed in this essay.

**Research Methods**

The second essay will be conducted at a major consulting firm located in the southeastern United States that has implemented expert governance and community governance in two separate knowledge repositories. In the first repository, experiences and lessons submitted by consultants are vetted, edited, and controlled by in-house experts, while in the second repository, similar knowledge assets are maintained in a community wiki that is rated, reviewed, and edited by the consultant community at large. Both repositories are available to all consultants, and their usage is voluntary. This “natural control” provides us a unique opportunity to understand consultants’ preference of governance mechanism in providing contributions.

The study will be interpretive in nature to identify the salient factors that influence consultants’ choice of governance mechanism. Purposive sampling will be employed to conduct semi-structured interviews with two groups of consultants (i.e.,
frequent and occasional contributors) from different areas of expertise. The interviews are expected to determine the salience of factors presented in Figure 1, as well as identify any other factors that are perceived as important by consultants in choosing a governance mechanism. As a result of the interviews, a new research model will be developed.

Note: The model includes a representative sample of constructs only.

**Figure 1. Research Model for Essay II**

**ESSAY III**

The third essay concerns knowledge use, and examines the effects of expert and community-governance on using knowledge from organizational repositories. In this essay, the term knowledge use refers to the *internalization* process described by Nonaka (1994), which is retrieving explicit knowledge from electronic repositories and employing it while performing an organizational task.

This essay is motivated by the fact that although expert and community-governance are widely employed by many organizations, our understanding of their efficacy in fostering knowledge use still remains limited. Prior literature states that individuals are more likely to use knowledge if it is of high quality (Pentland, 1995; Wiig, 1997). Therefore, conventional wisdom suggests that the success of governance mechanisms in increasing the quality of knowledge assets is directly related to individuals’ use of knowledge from repositories governed by those mechanisms. However, prior literature also suggests that quality is not the only determinant of knowledge use, but there are other determinants as well contingent upon the different types of cognitive processes that take place in the minds of individuals (Petty and Cacioppo, 1986; Sussman and Siegal, 2003). This essay attempts to understand these processes in the existence different governance mechanisms. Therefore, the RQs of this essay are: what is the impact of (1) expert governance and (2) community governance on using knowledge from repositories?
From a theoretical perspective, this study furthers our understanding of knowledge use from organizational repositories especially when there are mechanisms that render knowledge assets in these repositories more valuable. Since most organizational repositories are governed using one of the two mechanisms, it is essential that the concept of governance be included into existing theoretical frameworks. Further, governance concept can provide new insights in understanding different facets of knowledge use, increase the explanatory power of current theoretical frameworks, and reconcile some of the inconsistent findings in the literature.

From a practical perspective, an improved understanding of knowledge use is always important, as it is not possible to realize the benefits of KM initiatives if organizational members do not use knowledge assets that reside in repositories (Alavi and Leidner, 2001). This essay informs practitioners of the impacts of governance mechanisms on knowledge use, and provides them with the opportunity to choose the governance mechanism that fosters knowledge use the most in their organizations.

**Literature Review**

Current literature on knowledge use can be conceptualized in two separate streams. The first stream adopts a more macro view, and treats knowledge use as an overarching concept that consists of capturing, packaging, distribution, and use of knowledge. The goal is to identify the conditions under which knowledge use works best (e.g., Dixon, 2000; Markus, 2001). This stream provides two important insights: (1) knowledge use is contingent upon who the receiver is, what is being performed, and what type of knowledge is being transferred; and (2) knowledge repositories can support knowledge use by storing high-quality, de-contextualized, and easy-to-understand knowledge, and by providing certain design features such as indexing and search capabilities.

The second stream of research adopts a more micro view and investigates knowledge use by focusing on how individuals utilize knowledge assets from repositories. The dominant theoretical framework used in this stream is Elaboration Likelihood Model (ELM; Petty and Cacioppo, 1986). Studies in this stream extend ELM and empirically test it for information provided by expert systems (Dijkstra, 1999; Mak, Schmitt and Lyytinen, 1997), emails (Sussman and Siegal, 2003), and knowledge repositories (Fadel, Dursicova and Cha, 2008). Non-ELM studies in this area include the work of Boh (2008), which uses existing findings in the literature; and the work of Zang and Watts (2008), which draws upon Heuristic-Systematic Model (HSM; Chaiken, 1980). The second stream provides us with two key insights: (1) individuals are more likely to use knowledge if they find the information to be of high quality and the source to be credible; (2) individuals’ ability and motivation to elaborate (i.e., expertise and involvement respectively) are important as they determine whether individuals are more likely to rely on argument quality or source credibility while using knowledge.

Despite these insights, the literature ignores governance mechanisms during knowledge use, which are expected to impact individuals’ attitudes toward knowledge assets, and thus their use of knowledge. This essay addresses this gap in the literature.

**Theory**

The third essay uses the dual-process theory (e.g., Sloman, 1996) from cognitive psychology as a framework to investigate the impact of governance mechanisms. The fundamental premise of this theory is that individuals make judgments based on two separate cognitive processes. The first process (i.e., System 1) involves retrieving previous associations from memory about the features of an event or object. This process is “fast, automatic, effortless, associative, implicit […], and often emotionally charged” (Kahneman, 2003, p.698). System 1 generates responses unconsciously and it can be a major source of bias as individuals cannot refrain themselves from using it.

The second process (i.e., System 2), on the other hand, involves reasoning using the existing rules and propositions. This process is “slower, serial, effortful, more likely to be consciously monitored and deliberately controlled, […] relatively flexible and potentially rule governed.” (Kahneman, 2003, p.698). The responses generated by System 2 are usually deductive in nature.

The two processes described above can generate congruent as well as conflicting responses. Since individuals tend to strive for cognitive consistency (Festinger, 1957), conflicting responses are handled using two mechanisms: (1) suppression, where the less-preferred reaction is deliberately rejected, and (2) rationalization, where individuals try to justify or undermine one of the conflicting responses (Festinger, 1957). While suppression involves the elaboration process identified in the literature (Petty and Cacioppo, 1986), the rationalization process involves an interaction between System 1 and System 2, suggesting that these two processes may never work in isolation (Gawronski and Bodenhausen, 2006; Sloman, 1996).

The selection of the dual-process theory for the third essay over the more popular ELM is motivated by two reasons: (1) it subsumes ELM without suffering from its limitations (i.e., ELM operates in the persuasion context and focuses on different
types of information, while the dual-process theory is context-independent and focuses on processes (Kruglanski and Orehek, 2007)); (2) it provides us with new mechanisms through main and moderating effects that are not available in ELM or other frameworks.

Figure 2 presents the research model of this essay. As seen in the model, the effects of two governance mechanisms are combined in a single model to first understand their impact on knowledge use, and then compare their relative salience. The model suggests that intention to use knowledge is a function of individuals’ attitudes toward knowledge assets that reside in both expert and community-governed repositories. Attitude toward knowledge assets, in turn, is jointly determined by knowledge quality and credibility of governance mechanisms. Credibility of governance mechanisms is used instead of the more popular “source credibility” construct, because the involvement of experts or community of users in increasing the value of a knowledge asset can supersede the credibility of the original knowledge source in the minds of potential users of that knowledge. The propositions of this model are presented in Table 2. Due to space constraints, rationales of the propositions cannot be discussed.

\[\text{Description of constructs:}\]

\begin{align*}
\text{Quality - EG:} & \quad \text{Quality of expert-governed knowledge asset} \\
\text{Credibility of expert-gov.:} & \quad \text{Credibility of expert-governance} \\
\text{Attitude - EG:} & \quad \text{Attitude toward expert-governed knowledge asset} \\
\text{Quality - CG:} & \quad \text{Quality of community-governed knowledge asset} \\
\text{Attitude - CG:} & \quad \text{Attitude toward community-governed knowledge asset} \\
\text{Credibility of comm.-gov.:} & \quad \text{Credibility of community-governance}
\end{align*}

\[\text{Figure 2. Research Model for Essay III}\]
### Propositions of expert-governance model

<table>
<thead>
<tr>
<th>P1</th>
<th>Quality of an expert-governed knowledge asset (“Quality-EG”) is positively related to attitude toward that knowledge asset (“Attitude-EG”).</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2</td>
<td>Credibility of expert-governance is positively related to attitude toward an expert-governed knowledge asset (“Attitude-EG”).</td>
</tr>
<tr>
<td>P3</td>
<td>The relationship between knowledge quality (“Quality-EG”) and attitude toward that knowledge asset (“Attitude-EG”) is positively moderated by credibility of expert-governance.</td>
</tr>
<tr>
<td>P4</td>
<td>Attitude toward an expert-governed knowledge asset (“Attitude-EG”) is positively related to intention to use that knowledge asset.</td>
</tr>
</tbody>
</table>

### Propositions of community-governance model

<table>
<thead>
<tr>
<th>P5</th>
<th>Quality of a community-governed knowledge asset (“Quality-CG”) is positively related to attitude toward that knowledge asset (“Attitude-CG”).</th>
</tr>
</thead>
<tbody>
<tr>
<td>P6</td>
<td>Credibility of community-governance is positively related to attitude toward a community-governed knowledge asset (“Attitude-CG”).</td>
</tr>
<tr>
<td>P7</td>
<td>The relationship between knowledge quality (“Quality-CG”) and attitude toward that knowledge asset (“Attitude-CG”) is positively moderated by credibility of community-governance.</td>
</tr>
<tr>
<td>P8</td>
<td>Attitude toward a community-governed knowledge asset (“Attitude-CG”) is positively related to intention to use that knowledge asset.</td>
</tr>
</tbody>
</table>

**Table 2. Propositions of Essay III**

### Research Methods

The research model developed in the third essay will be empirically validated using a field experiment at the same consulting firm described in Essay 2. Consultants will be randomly assigned into two groups, and their credibility in expert and community governance will be measured along with other control and demographic variables. The first group will then be given two pieces of knowledge with high quality (i.e., one from an expert-governed and another from a community-governed repository) and asked to perform an experimental task. The second group will be given the same set of knowledge with low quality to perform the same task. Following task completion, subjects’ use of knowledge from either repository will be measured by asking them the extent to which they used the knowledge provided to complete the experimental task.

The experimental data will be analyzed using structural equation modeling (SEM) within each group. Between-group comparisons will employ the analysis of co-variance (ANCOVA) technique, due to the presence of control variables. Before the actual experiment, a pilot study will be conducted to assure measurement validity of the instrument. If possible, experimental task will be chosen from prior literature to increase the validity and the comparability of the findings.

### REFERENCES


