A Knowledge Contribution Model to a Knowledge Management System

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ABSTRACT
An organization’s capability to amalgamate and disseminate its intellectual capital to enhance organizational learning and decision-making – knowledge management (KM) – is linked to the long-term viability of many firms and is becoming increasingly dependent on the contributions of employees. In this paper, we explore the motivations for the continual non-perfunctory contribution of knowledge to knowledge management systems and propose a success model, with Knowledge Contribution as the major variable of interest and Individual Belief Structure and Organizational Context as key antecedents of success. While some components of the model have been empirically tested in prior research, the knowledge contribution construct remains unexplored. We therefore derive several propositions from this model to form the basis for future evaluation of this key KM success factor.

INTRODUCTION
In an era where organizational learning and knowledge management (KM) are of significant interest to organizations, knowledge is recognized as a critical asset, and the long-term viability of some organizations is linked to their ability to harness their accumulated intellectual capital - employees’ knowledge - and disseminate it for effective decision-making. The success of the KM effort has become vital to organizations; as an example KPMG says that, as a result of its KM capability, when one of its professionals engage a client all 35000 employees walk in with him or her (Jessop & Valacich, 1999).

This knowledge-based view of a firm (Nonaka & Takeuchi, 1995), is an extension of the resource-based view, which regards knowledge as a critical resource to be leveraged to the firm’s advantage. If knowledge is such a critical resource, then it too has to be managed like any other important organizational asset. Consequently, there is a generally accepted KM process, which includes knowledge creation, storage and retrieval, transfer, and application as its components (Alavi & Leidner, 2001).

However, it is believed that the extent to which employees can be motivated to voluntarily share individual knowledge and participate in extending the pool of organizational knowledge – knowledge contribution – is a significant determinant of derivable benefits and needs to be addressed in the KM process schema (Alavi & Leidner, 2001). The amalgam of organization knowledge can only be effective if the KM process maximizes the contribution of employees. We therefore posit that Knowledge Contribution is a critical success factor in KM and requires its own specific focus in this process, which should be slotted between the creation and storage components.

Several researchers have prescribed conceptual approaches to knowledge sharing (Goodman & Darr, 1998; Markus, 2001; Wasko & Faraj, 2000). Others have contributed empirical insights through experiments and surveys (Bock et al., 2005; Constant et al., 1994) in an attempt to understand, model and explain the behavior of contributing employees, with varying degrees of success. Exactly what drives this contribution of knowledge is still not well known.

This paper explores the motivations for the continual non-perfunctory contribution of knowledge to a knowledge management system (KMS) from the perspective of the personal belief of the contributor (intrinsic motivation), organizational context of the host firm (extrinsic motivation), and information quality (learning from system content by the contributor). The objective is to enhance the state of existing knowledge of this increasingly important and interesting topic by providing a theoretical model that explicitly examines the influence of knowledge contribution to a KMS in a modified KM process. This model is used to generate a set of propositions that provides some focus for future research we expect to conduct in this area and to stimulate the interest of other researchers.

KNOWLEDGE MANAGEMENT AND KNOWLEDGE CONTRIBUTION
The link between a firm’s performance represented by business value and its knowledge is articulated by the knowledge based view theory of a firm (Grant, 1996), the business value here is the attainment of the goals, and the contribution of these goals to the overall corporate objectives. This knowledge that the firm possesses resides in employees who create, recognize, archive, access and apply knowledge in carrying out their task (Bock et al., 2005). The challenge here is to have this knowledge continually updated, and through this process facilitate an environment for the creation of new knowledge.

Knowledge can be classified dimensionally as tacit or explicit (Nonaka, 1994). The latter - the component of knowledge that cannot be easily expressed or codified - is of particular interest in this paper. Because individuals cannot be forced to share this knowledge, organizations must create an environment conducive to knowledge sharing, and motivate its employees to part with their knowledge. Knowledge sharing in this context is defined as making explicit, codifying, and recording the tacit knowledge in an electronic format. In order for the KM effort to be successful, organizations must understand what drives employees’ motivations to contribute. Contributors need incentives to part with their knowledge; those who will use the knowledge must be willing to obtain it from the KMS (Ba, et al., 2001).

It is accepted that organizations neither know what factors drive the use of KMS (Markus, 2001) nor what incentives are effective in encouraging knowledge contribution and sharing (Alavi & Leidner, 2001); hence there is a need for a knowledge contribution success model. Similar to the IS success model (DeLone & McLean, 1992; DeLone & McLean, 2003), we are proposing a success model for a KMS with the quality of Knowledge Contribution as a primary focus, driven by behavioral and information quality antecedents. It is intended that this model would form part of a generic framework for evaluating the success of a KMS implementation.
TOWARD THE DEVELOPMENT OF THE MODEL
The interest in organizational learning and the management of what is being learnt, i.e. the knowledge, has spawned an area of IS research called knowledge management. A KMS is comprised of the following knowledge processes: creation, storage and retrieval, transfer, application (Holzner & Marx, 1979; Pentland, 1995). The focus here is what happens between the creation and storage of knowledge, i.e. the contribution of knowledge. Although the technical system is important, it doesn’t guarantee success in the KM effort (McDermott, 1999). The question of what incentives were effective in encouraging knowledge contribution and sharing in organizations has been raised by Alavi and Leidner, (2001).

Ko et al. (2005) explored the intrinsic and extrinsic stimuli that motivate employees to share and contribute knowledge to a KMS. They found that intrinsic motivation was the more significant of the two in facilitating knowledge transfer. Employees are intrinsically motivated, when their needs are directly satisfied (e.g., self-defined goals), or when their satisfaction lies in the content of the activity itself (Ko et al., 2005). Intrinsic motivation occurs when an activity “is valued for its own sake and appears to be self sustained” (Calder & Staw, 1975)p. 599).

Intrinsic motivation is important to the transfer of best practices (O’Dell & Grayson, 1998), and intrinsic motivation should enable the transfer of tacit knowledge (Osterloh & Frey, 2000). The contributor has to be convinced that it is worthwhile to contribute to a KMS, otherwise it will be done perfunctorily.

Motional incentives are derived from two sources (Szulanski, 1996): (1) employees’ personal belief structure, and (2) institutional structures values, norms and accepted practices that shape an individual’s belief structure (DeLong & Fahey, 2000). Sharing knowledge takes time and effort (Gilbert & Krause, 2002), and leveraging at work results in the public good dilemma (Barry & Hardin, 1982); others will have access to the accumulated knowledge of the organization whether or they not contributed to this knowledge pool (Dawes, 1980; Thorn & Connolly, 1987).

By sharing knowledge an employee could perceive that he or she stands to lose their uniqueness to the organization, and this comes at the cost of time, effort, and uniqueness that the employee might not be willing to incur for ‘good’ reason.

The theories of resistance to management information systems (MIS) speak to the reluctance to use, misuse, or underutilize a system. MIS are resisted because of a person’s own internal factors, poorly designed systems, and/or because of the interaction of specific system design features with aspects of the organizational context of system use (Markus, 1983). The first theory of resistance is related to intrinsic motivation, i.e. personal reasons for resisting system use. The issue of system design and its fit for the task, i.e. the second theory of resistance, is deferred and will be covered later as the information systems artifact.

As articulated by Markus (1983), the third theory of resistance, interaction theory (Kling, 1980), indicates that it is system use in an organizational context that causes concern and resistance. Drawing on an insight from Bock et al. (2005), in an organization undergoing manpower restructuring, personnel could possibly perceive that having codified (shared) their knowledge they become more dispensable, thus generating resistance.

Regarding the second theory of resistance, it is recognized that information, system and service quality are critical parameters in IS success according to DeLone & McLean, (2003), who asserted that IS researchers need to choose the dependent variable according to the context of the problem they are trying to resolve; in this case Knowledge Contribution is made the variable of interest paralleling knowledge transfer from Ko et al., 2005. For the sake of parsimony of the model, the service quality issue will be discounted, i.e. service is assumed to be at its best. For system quality issues, the assumption here is that the application works very well, see system quality measures (DeLone & McLean, 1992). Applying the DeLone and McLean (2003) IS success model, if the end knowledge interaction is Knowledge Contribution, then Information Quality is directly affected by the outcome, i.e. a closed loop. Information quality in a KMS is dependent on the quality of the Knowledge Contribution, so long as the contributor is not contributing perfunctorily. See information quality measures (DeLone & McLean, 1992).

The Modified Knowledge Management Process
Table 1 outlines the modified knowledge management process. In keeping with the tone of this article, we have included Knowledge Contribution as a step in the knowledge management process that requires deliberate attention in and of itself, instead of as a sub-element of Knowledge Creation.

The Knowledge Contribution process can be managed; this process would involve influencing belief and behavior, a sphere that may lie outside of the IS artifact (probably explaining why it was omitted from a model developed by IS researchers). Behavior is a social issue, and social issues contribute to the success of a KM effort (Ruppel & Harrington, 2001).

The issue of contribution is well recognized, and the need to better control the outcome between the creation and storage process (Ko et al., 2005).

The Knowledge Contribution Model
Figure 1 depicts an adaptation of the DeLone and McLean (2003) IS success model for this particular problem, with Knowledge Contribution as the variable of interest: It relates the following variables:

- **Individual Belief Structure** is defined as the intrinsic motivation for an employee to contribute (Ko et al., 2005). The employee might be motivated by the organization’s reward scheme (monetary incentives, educational assistance, peer recognition, etc.) or de-motivated by the risk of losing their value after contributing with knowledge. Motivation is also impacted by the perceived usefulness of the accumulated contributed knowledge or the overall impact that this contributed knowledge could have on the organization’s performance.

- **Information Quality** is defined as the embodiment of the information quality measures (DeLone & McLean, 1992) in the content of the KMS.

- **Organizational Context** is defined as the state of the environment in which the system use occurs. This is inclusive of organizational culture, use of power, the role of politics, extrinsic motivation such as compensation, industry competitiveness, etc. (Bock et al., 2005; Ko et al., 2005; Markus, 1983; Powell & Dent-Micallef, 1997; Quaddus & Xu, 2005).

- **Use** is defined as the voluntary component of the interaction with the system to both contributing and consuming content (Ein-Dor & Segev, 1978; Hamilton & Chervany, 1981; Zmud, 1978); see the Use measures (DeLone & McLean, 1992). It is important to distinguish between the involuntary use of a system that the workflow process demands resulting in perfunctory contribution and consumption, and the voluntary use, which results in quality contribution to the KMS. Use is also defined here as the search for required information (whether it is found or not), suggesting that the user was willing to consume the content of the KMS.

- **User Satisfaction** is defined as the recipient’s response to the consumption of the content of the system (Ein-Dor & Segev, 1978; Hamilton & Chervany, 1981), see the User Satisfaction measures (DeLone & McLean, 1992).
CONCLUSION

In this paper we have addressed an important issue of KM - Knowledge Contribution - in an attempt to provide some insights into an aspect of this important subject, which is often ignored or subsumed under other process steps such as knowledge creation. Potentially, it is a pivotal ingredient of KM, which we believe deserves specific consideration. Accordingly, we have modified the KM process to reflect this.

We have also provided a knowledge contribution model, from which we derived propositions that may be later translated into testable hypotheses. The intention is to use the proposed model to conduct our own research in the future and to provide a starting point for others to engage in similar research in this very interesting and important segment of KM, and to make a useful contribution to the literature. In our future research we will test the model and associated propositions with guidance from similar methodologies for related works in testing models of IS success, knowledge sharing, and transfer (Bock et al., 2005; Ko et al., 2005). The answers to several research questions in this area are pending. For example, what are the precise factors that influence knowledge contribution, what are the strengths of their influences, and to what extent they interact. We have taken a step in providing some answers and hope we have encouraged others to participate.

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