Habermasian Inquiring System: Toward a General Framework for Knowledge Management Research

Guo Zining[*]   Jim Sheffield[†]

[*]University of Auckland,

[†]University of Auckland, j.sheffield@auckland.ac.nz

Habermasian Inquiring System: Toward a General Framework For Knowledge Management Research

Zining Guo
University of Auckland
rickyguo@vip.163.com

James Sheffield
University of Auckland
j.sheffield@auckland.ac.nz

Abstract

This study addresses a long-standing and well-recognized problem in KM research, namely the lack of conceptual integration and a cumulative tradition. Knowledge management needs an overarching framework to unify and direct research. This paper reports on the development of such a framework. Elements of the proposed framework are created by synthesizing concepts from the systems thinking and critical thinking traditions. It is argued that the synthesis of aspects of Churchman's inquiring systems and Habermas' critical social theory provides a philosophically grounded, universally pragmatic framework useful in managing the complexity, and conceptualizing the richness, of knowledge phenomena.

The key architectural element in this framework is Habermas' knowledge interests. Habermas' three knowledge interests (technical, practical and emancipatory) form a three-level integrating structure. Framework development consists of describing how four other design elements (Habermas' three rationalities, Churchman's roles, knowledge dynamics, and research paradigms) are positioned within this integrating structure.

1. Introduction

The academic world has recently been paying increased attention to knowledge management research. A large number of articles have appeared in peer-reviewed academic journals across a wide variety of disciplines, including management science, organization studies, and information systems.

However, academic research in knowledge management is far from mature. It has been identified that the current research lacks cumulativeness and conceptual integration: the research community has shown minimal consensus on definitions, taxonomies, approaches, frameworks, theories and models. [1] This lack of conceptual integration makes it difficult to compare, contrast, and synthesize research findings, and thus restrains the overall progress of research. Knowledge management needs an overarching framework to unify and direct research. [2]

This paper seeks to develop such a general framework. Elements of this framework are created by synthesizing concepts from the systems thinking and critical thinking traditions. It is argued that the synthesis of aspects of Churchman's inquiring systems and Habermas' critical social theory provides a philosophically grounded, universally pragmatic framework useful in managing the complexity, and conceptualizing the richness, of knowledge phenomena.

The remainder of the paper is organized as follows. Section 2 briefly reviews the knowledge management literature to document the desirable characteristics of an overarching framework. Section 3 incrementally develops such a framework by synthesizing selected elements from the work by Churchman and Habermas. Section 4 discusses the resulting framework in a broader context to identify the nature of the contribution. Section 5 concludes the report and identifies additional research required to test the usefulness of the framework.

2. Objective: An overarching framework for knowledge management research

The objective of the current research is to develop an overarching framework for knowledge management research. This section provides a brief and selective review of three literatures and suggests an architecture for the proposed framework. Firstly, the need for such an overarching framework is established by reviewing certain papers from the knowledge management community. Secondly, the work by a prominent systems thinker (Churchman) on inquiring systems is introduced as a possible support for such a framework. Thirdly, work by Habermas on critical social theory is identified as a possible basis for a "Habermasian Inquiring System" useful for guiding knowledge management research. In response to this review, the requirements of an overarching framework are proposed along with an initial definition of knowledge.

2.1. Knowledge management research

Multiple studies have shown that the current research in knowledge management lacks conceptual integration. [1-6]

First and foremost, knowledge management researchers differ in their definitions concerning the concept of knowledge. [3, 5] Knowledge has been defined vis-à-vis data and information; as an object or a process; as a state of mind; as access to information; or as capability. [7-12]

The lack of consensus over the definition of knowledge is partly responsible for the confusing variety of approaches, frameworks, and theories. A study by Earl (2001) summarizes seven different approaches to knowledge management research, viz. systems, cartographic, engineering, commercial, organizational, spatial, and strategic, with each having its own philosophical underpinnings, research focus, and aim. Rubenstein-Montano et al (2001) and Croasdell et al (2003) also argue that the current frameworks do not provide a holistic, systemic view of knowledge management, and there is a lack of coherence and consensus across frameworks.

In summary, knowledge management research is in an emergent, theory-building stage. [1] There is the lack of an overarching framework to unify the existing body of research and provide direction for new research. [2] We next consider the possibility that such a framework can be synthesized from elements of the systems thinking and critical thinking traditions.

2.2. Review of Churchman's inquiring systems

C. West Churchman is a systems thinker and disciple of the James-Singer tradition of pragmatism. Churchman seeks ways of applying philosophical principles (including ethics) to link theory and practice. [13] Churchman's thinking has initiated a tradition in management science and information systems. [14-18]

Of particular interest is Churchman's way of operationalizing philosophical thinking as inquiring systems. The "purpose of an inquiring system is to create knowledge which means creating the capability of choosing the right means for one's desired ends". (Churchman, 1997, p.200) In other words, an inquiring system is the mechanism in which evidence is generated for the purpose of problem solving. Churchman (1971) operationalized the philosophical thinking of Leibniz, Locke, Kant, Hegel and Singer, and created five archetypal inquiring systems. Each archetype offers a unique way of generating evidence and represents a view of the world. [16, 19]

Churchman's treatise on inquiring systems has initiated several streams of research. One group of researchers have replicated Churchman's method of operationalization and adopted the thinking of other philosophers to create inquiring systems. [20-30] Another group of researchers speculate on the implications of inquiring systems for research, design, and practice. [31-34]

The potential value of the concept of inquiring systems to knowledge management research has been identified. Courtney, Croasdell and Paradice (1998) applied Churchman's five archetypes of inquiry to organizational learning. They proposed the notion of inquiring organizations and explored possible IT support for different types of inquiring organizations. Courtney (2001) explored the potential value of the concept of inquiring systems in knowledge management, and argued that the inquiring systems offer a new paradigm to support decision-making. Richardson, Courtney and Paradice (2001) provided empirical evidence on Singerian inquiring organizational models. Richardson and Courtney (2004) developed Singerian-Churchmanian inquiring system into a design concept they termed "Churchmanian knowledge management systems" (CKMS).

2.3. Review of Habermas' critical social theory

Jürgen Habermas is a critical social theorist and contemporary German philosopher. As a modernist, Habermas believes in the power of reason of the Enlightenment to rationalize society and human life. As a critical social theorist, Habermas is suspicious of the increasing bureaucratization and systemization of current Western society. He argues that the instrumental rationalization of the social system produces communicative distortion and the colonization of an individual's lived experience or "life-world". [35] He thus advocates communicative action both to surface what he describes as systematic communicative distortion, and to emancipate individuals from coercion and force. [35-37] Habermas' critical social theory has initiated a tradition in management science and information systems. [35, 38-43]

Of particular interest is Habermas' theory of knowledge-constitutive interests and communicative action. Habermas recognizes three knowledge-constitutive interests, viz. technical, practical, and emancipatory. The *technical* knowledge interest is concern for human "work", which encompasses any interactions with the physical world. It is associated with the objectivist belief in "reality-in-itself", i.e. that reality is structured in a law-like manner independent of human intervention. [44] The *practical* knowledge interest is concerned with interpretation of language and intersubjective communication. [35] It is associated with the constructionist belief in meaning as it is interpreted, understood, and shared. The *emancipatory* knowledge interest is concern for emancipation from colonization of the life-world. [35] It provides a dialectical synthesis of,

and a self-reflection on, both the technical and practical approaches. [35] Habermas uses knowledge interests to frame a typology of actions. Such a typology may be useful to guide actions of knowledge management researchers.

Habermas' critical social theory has received attention from at least some knowledge management researchers. Ulrich (2001a, 2001b) incorporated Habermas' practical philosophy into a discussion of a philosophical staircase with three levels - information, knowledge, and rational action. Marshall and Brady (2001) applied Habermas' critical theory to analyze findings of an empirical study of the politics of knowledge. Panagiotidis and Edwards (2001) explored Habermas' philosophy in the domain of organizational learning and proposed a methodology named Business Systems Purpose Analysis (BSPA). No research was located that took a Habermasian approach to the development or application of an overarching framework for knowledge management research.

2.4. Research objective

The research is motivated by the lack of conceptual integration of knowledge management research. The objective is to explore the possibility of developing a Habermasian Inquiring System (HIS) as a general framework to guide and structure knowledge management research. The key requirement of the HIS is that it supports researchers with widely different research interests - technical, practical, and emancipatory. An initial definition of knowledge consistent with the proposed framework is:

Knowledge is the capability of choosing the rational action for a certain purpose.

The definition above is incrementally developed by drawing upon practical philosophy and Churchman's [14] treatment of teleology in the context of inquiring systems. Due to the limited space, the inferential process by which this definition is developed is omitted.

3. Framework development

In the proposed framework the key architectural element is Habermas' knowledge interests. Habermas' three knowledge interests (technical, practical, and emancipatory) form a three-level integrating structure. Framework development consists of describing how four other design elements (Habermas' three rationalities, Churchman's roles, knowledge dynamics, and research paradigms) are positioned within this integrating structure.

Section 3 incrementally develops the Habermasian Inquiring System (HIS) in a four-step process. Because Habermas' three knowledge interests and three rationalities are closely linked, the latter are discussed upfront in Section 3.1. Churchman's roles are discussed in Section 3.2 so as to illustrate the dynamic nature of the organizing process. Knowledge dynamics are discussed in Section 3.3. Research paradigms that guide current knowledge management research are added in Section 3.4.

3.1. Habermas' three rationalities

Rationality is the quality or state of being rational, i.e., intelligent, logical, reasonable, sensible, sound. Habermas describes three knowledge worlds and the rationality associated with each. These knowledge worlds and rationalities are fundamental to the HIS. Firstly, there exists a *technical*, objective reality that represents humans' interactions with the physical world. This technical reality reflects purposeful intervention or "work" by humans and is associated with Habermas' technical knowledge interest and *instrumental rationality*. [35, 45] Secondly, there exists an *intersubjective* reality that represents humans' social world. To better reflect the dynamic aspects of knowledge management research (which is primarily on business organizations) Habermas' interpersonal world will be associated with the "organizing" or *organizational* level of the HIS. This social reality is subject to interpretation of meaning and is associated with Habermas' practical knowledge interest, social actor's successful completion of work tasks, and *strategic rationality*. Thirdly, there exists a subjective reality that represents each human's *personal* world. This personal reality is subject to self-reflection and is associated with Habermas' emancipatory interest and *communicative rationality*. In accordance with Habermas, instrumental rationality and strategic rationality of the HIS are oriented toward technical and organizational success respectively, whilst communicative rationality is oriented toward reaching mutual understanding. [36] (Figure 1)
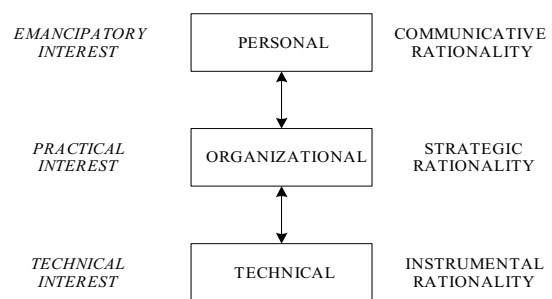

Figure 1. Habermas' three rationalities

3.2. Churchman's roles

In developing an inquiring system Churchman (1971) employs generic roles each motivated by a distinctive

rationality. In developing the HIS framework, Churchman's concepts of client, decision maker, designer, and measure of performance are recognized, and conceptualized in a way that incorporates Habermas' three knowledge worlds. Note that in both Churchman (1971) and the HIS, one person may have more than role and one role may be associated with more than one person. The organizing process, which must resolve role conflict, produces the complex and nuanced knowledge dynamics introduced in the next section.

In the HIS, the *client* is conceptualized at the personal level. The client is defined as any individual who is within the boundaries of the system and has a stake in the system. Each client has an interest and value system that forms a set of expectations out of his/her roles in the organization. Each client is teleological when his/her value system frames desired-ends or objectives that he/she may achieve from the system. [14] It is inferred that the client has his/her own standard concerning the measure of performance of the system. Actual performance either confirms or disconfirms the ends desired by the client. Even though the measure of performance can be objectified in the form of numerical reports, the standard of the client is subjective, and the confirmation or disconfirmation of the ends desired is subject to the client's own perception.

In the HIS, the *decision maker* is conceptualized at the organizational level. The decision maker is the person or persons that control the resources of the system and makes decisions as to what actions should be taken using organizational resources to change the values associated with the *measure of performance*. [14] The decision maker, in the aggregate sense, also possesses a value system and this value system does not necessarily agree with those of the clients. [14] It is this aggregation and interaction of the value system of each client that shapes the value system of the decision maker as a whole. Thus, the formation of the aggregate value system of the decision maker, which is a precondition to any decision, is an intersubjective, consensus-building process. The decision made and the action followed produces changes in the measures of performance as perceived by both the decision maker and the client.

In the HIS, the role of the *designer* is conceptualized as the interface between each pair of levels. The *designer-as-facilitator* links the personal and organizational levels; the *designer–as-expert* links the organizational and technical levels. This is based on two premises: (1) the designer's value system is considered identical to that of the client; (2) the designer possesses the potential, through the decision maker, of producing changes in the measure of performance. [14] Between the personal level and the organizational level, the designer identifies the client and the decision maker and seeks to understand their value systems. The designer then facilitates the intersubjective

communications of the clients for decision-making. Between the organizational level and technical level, the designer designs, plans, and supervises the actual course of action taken as result of the decision made. Here the designer is a person or persons with factual knowledge and the technical expertise to change measures of performance. The designer understands the intentions of the decision and uses factual knowledge to organize empirical inquiry or implementation. In addition the designer measures technical performance and provides feedback to the decision maker. (Figure 2)
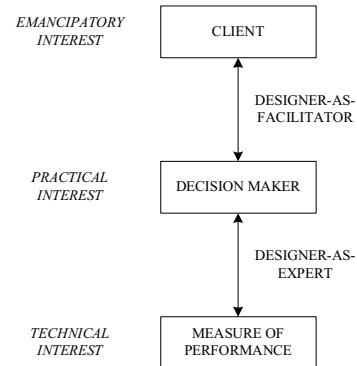

Figure 2. Churchman's roles

3.3. Knowledge dynamics

In this section, the concepts of *knowledge creation*, *knowledge normalization*, and *knowledge application* are introduced and integrated with the HIS operationalization of Habermas' three rationalities and Churchman's roles.

Knowledge Creation. In the HIS, knowledge creation starts on the personal level when the individual gradually acquires knowledge over time through education, experience, self-reflection, etc. On one hand, any individual is always already situated in a social setting. The normative force of the social reality (e.g. culture or education) helps to shape the individual's value system and influence his/her accrual of the capability for rational action. On the other hand, the individual interacts directly with the technical world of material facts, and produces changes in the measure of performance in a way he/she perceives to be appropriate. The constant gap between the actual state of the technical world and the state desired helps to form the individual's own perception of his/her own knowledge. [46] These bidirectional interactions between the personal level and the organizational level, and the personal level and the technical level, constitute the *creation of personal knowledge*.

Knowledge Normalization. When the individual is set inside an organizational context, his/her interpersonal interactions enact organizational knowledge in a manner that is subject to the norms of the collective decision

maker. Since the organization's social realities are made up of all the clients involved, the personal knowledge of the client constantly shapes and re-shapes the collective knowledge of the organization. Here, the collective organizational knowledge is considered as the collective "capability of choosing the rational action for a certain purpose" (Section 2.4), via the value-laden aggregation of the personal knowledge of the clients involved. Thus, formation and transformation of collective organizational knowledge are based on the normalization of personal knowledge in conformity to the value system of the collective decision maker.

There are two idealized possibilities for normalization. The first is that personal knowledge is realized in such a manner that its capability for action has been embedded in, and *institutionalized* as, the norms of the organization. However, it should be noted that this institutionalization is not a direct adoption; instead, personal knowledge is institutionalized when it is valued by the decision maker, aligned to the decision maker's will, and absorbed in a way endorsed by the decision maker. The second possibility is that personal knowledge is recognized and utilized by the organization but its capability has not been embedded into organizational norms. This normalization takes the form of the *empowerment* of the individual who is perceived to possess the capability valued by the decision maker. When empowerment takes place, personal knowledge is adopted as part of organizational knowledge but remains in a standalone state. In both institutionalization and empowerment, the personal knowledge of the empowered client is actualized in conformity to the value system of the collective, organizational decision maker.

Knowledge Application. Organizational knowledge is applied when the decision maker's choice of rational action interacts with the physical world in the technical sense. The decision maker's action produces changes in the measure of performance to reduce the perceived discrepancies between the current state and the state desired by the decision maker's value system. [46] As with knowledge creation and normalization, the application of organizational knowledge to the technical world consists of bidirectional interactions. On one hand, this application produces changes in the performance in its technical sense. On the other hand, the constant gap between the actual state of the technical world and the desired state influences both the plan of action of the decision maker and the perceived value of organizational knowledge. It is now clear that the HIS represents a complex learning system, where there are bidirectional loops between each pair of the three levels of rationality.

It is apparent that knowledge creation is oriented toward emancipatory interest and mutual understanding, and that knowledge normalization and knowledge application are actions oriented toward success defined in

Habermasian terms. [36] The organizational system constitutes a force that colonizes the life-world in that the client as an individual is obliged to submit to the decision maker's norms. Colonization is complete when the value of personal knowledge is no more than its instrumental value in the technical world as perceived by the decision maker. When the value system of the client does not agree with that of the decision maker, the dominance of strategic rationality and instrumental rationality hampers the full realization of the client's capability of choice of rational action for *his/her own* purpose. In this respect, the creation, normalization, and application of knowledge are value-laden. It is here that communicative rationality comes into play. Communicative action seeks mutual understanding by surfacing the hidden agenda of the value systems concealed in strategic and instrumental rationalities. [36] Thus, the knowledge dynamics of the HIS can be visualized as in Figure 3.
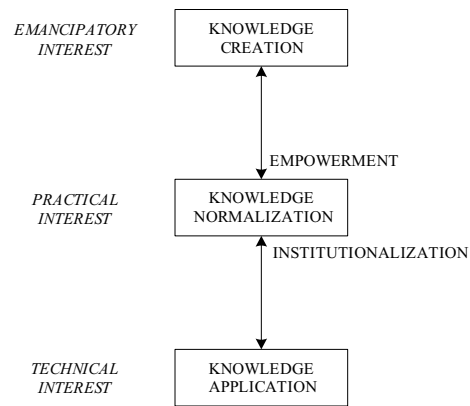

Figure 3. Knowledge dynamics

3.4. Research paradigms

Knowledge interests in the Habermasian sense direct the phenomenon studied (research interest) and the guarantor of the knowledge gained in a particular research paradigm. Each knowledge interest is also associated with a tradition of systems thinking. (Table 1) [35, 36, 44, 45, 47]

Table 1. Research paradigms		
Research Interests	**Research Paradigms**	**Traditions of Systems thinking**
Emancipatory	Critical pluralism	Critical
Practical	Interpretivism	Soft
Technical	Positivism	Hard

A researcher's technical knowledge interest motivates a study of objective reality. The *positivist paradigm* is adopted in the tradition of *"hard" systems thinking*. Instrumental rationality drives the empirical-analytic sciences and research designs centered on measurement, causal relationships, prediction, and the imposition of control. Knowledge is associated with hard data, mathematics, and models.

A researcher's practical knowledge interest motivates a study of social reality. The *interpretivist paradigm* is adopted in the tradition of *"soft" systems thinking*. Strategic rationality drives the hermeneutic-phenomenological sciences and research on phenomena that are emergent and subject to social interpretation. The main task of inquiry is to understand the potential ambiguity and uncertainty of social meaning. Knowledge is associated with the understanding of participants in social interaction.

A researcher's emancipatory knowledge interest motivates a study of personal reality. *The critical pluralist paradigm* is adopted in the tradition of *"critical" systems thinking*. Communicative rationality drives the critically oriented sciences in their questioning of the legitimacy of the status quo and guides their concern about structured contradictions and/or exploitation. [45] The main task of

inquiry is to examine the legitimacy of the current system and to provide a stimulus for emancipatory change.

Thus, the suggestions for research design by the HIS may be visualized as in Figure 4.
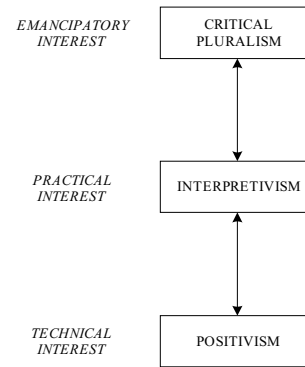

Figure 4. Research paradigms

Based on the incremental discussions above, the four aspects of the HIS may be integrated to form the complete framework. This is illustrated in Figure 5 and Figure 6.
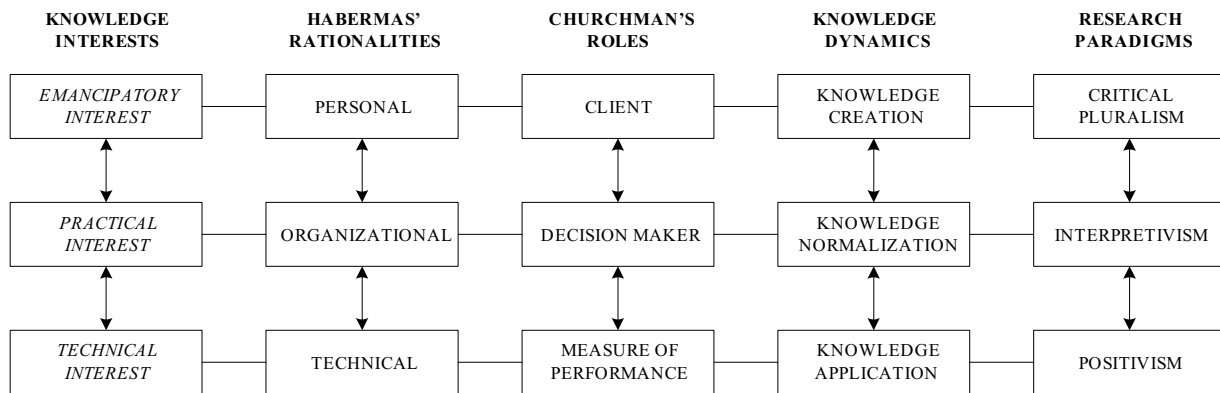

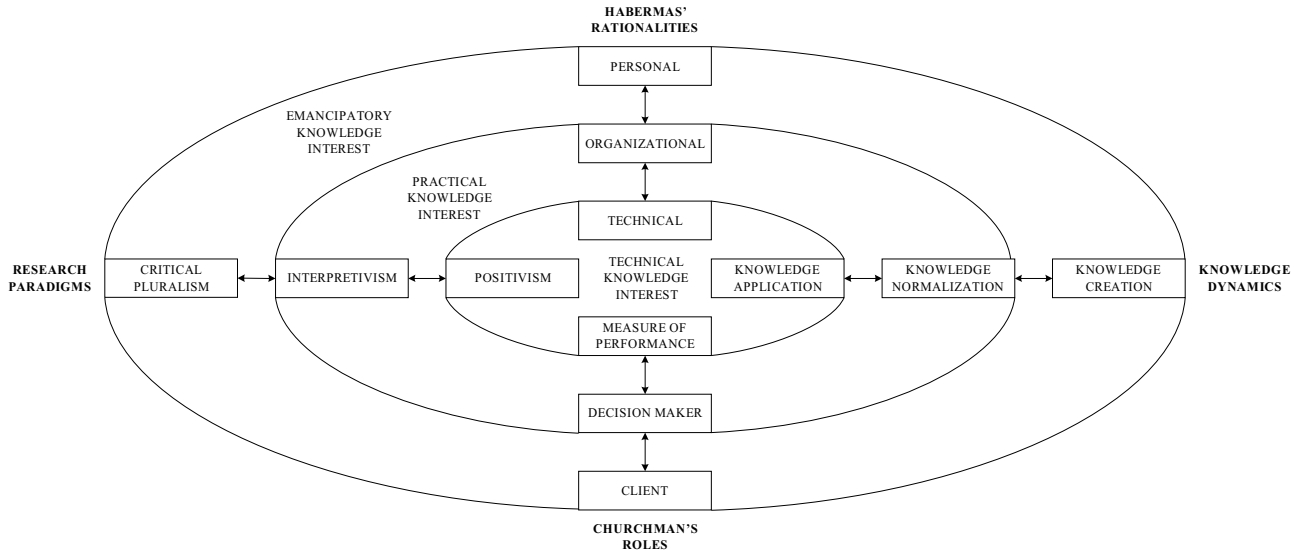**Figure 5. Habermasian Inquiring System – Block View**

Figure 6. Habermasian Inquiring System – Radial View

4. Discussions

This section discusses the framework developed in the previous section and links it to broader issues to identify the nature of the contribution.

Section 1 identified that knowledge management research currently lacks cumulativeness and conceptual integration, and that knowledge management needs an overarching framework to unify and direct research.

Section 2 identified that knowledge management research is in an emergent, theory-building stage. It was proposed that concepts from Churchman's inquiring systems and Habermas' critical social theory might be synthesized to unify and direct research. The key requirement of the proposed framework is that it supports researchers with widely different research interests - technical, practical, and emancipatory.

Section 3 developed a Habermasian Inquiring System to meet this requirement. The framework provides a philosophically grounded, universally pragmatic framework potentially useful in managing the complexity, and conceptualizing the richness, of knowledge phenomena. (Figures 5 and 6)

On the highest level, the development of the HIS contributes to the stream of research that seeks to synthesize the potential conflicts of systems thinking and critical thinking, which are grounded, respectively, in systemic modernism and critical modernism. [35, 38] Inherent conflict exists between performativity-oriented systems thinking and the emancipation-oriented critical thinking. [35] The nub of the conflict is that, while systems thinking seeks to maximize performativity, it creates and/or reinforces a social system, which colonizes the same life-world that critical thinking seeks to emancipate. [35, 37, 38] Thus, the two traditions form a thesis and an antithesis. One possibility of synthesizing the two is to take a dialectical stance that recognizes both the performativity orientation and the emancipation orientation so as to conceptualize a universal representation of all of the objective, intersubjective, and subjective realities.

The HIS is an effort in this direction. The key architectural element in this framework is Habermas' knowledge interests. Habermas' three knowledge interests (technical, practical, and emancipatory), form a three-level integrating structure. This structure is associated with Habermas' three rationalities (instrumental, practical, and communicative) and is translated into a three-level representation (technical, organizational, and personal). This trichotomous conceptualization is the philosophical core for discussions of the HIS. (Section 3.1)

When this three-level thinking is instantiated into an organizational context, a systemic analysis of the organizational dynamics is required as a precondition to framing knowledge-related activities. To this end, Churchman's treatise on a generic learning system is carefully adopted and re-created alongside Habermas' three rationalities. This philosophically grounded understanding of organizational dynamics provides a necessary condition for studying knowledge management in a social context. (Section 3.2)

Three primary categories of knowledge-related activities are examined: knowledge creation, knowledge normalization, and knowledge application, each closely integrated with Habermas' three rationalities and

explicated by Churchman's organizational role-playing. Importantly, knowledge purely on the personal level is differentiated from knowledge normalized on the organizational level. Churchman's treatise on the potentially different value systems of the client and the decision maker is fully recognized in the framework, which recognizes that knowledge-related activities are inherently value-laden and are subject to the play of power and politics. This argument provides knowledge management research with the concepts required for critical scrutiny. (Section 3.3)

The HIS draws upon these discussions to provide a new framework for research design. Three research paradigms, namely positivism, interpretivism, and critical pluralism, are identified as the appropriate theoretical perspectives to translate instrumental rationality, strategic rationality, and communicative rationality into technical research interest, practical research interest, and emancipatory research interest, respectively. The integration of Habermas' rationalities, Churchman's roles, knowledge dynamics, and research paradigms provides a new general framework with the potential to guide the design, implementation, and evaluation of research on knowledge management. (Section 3.4)

In summary, the HIS has made four significant contributions. Firstly, the HIS offers a consistent perspective for studying knowledge that is systemic, and closely related to decision-making and rational action. Secondly, the HIS offers a consistent perspective for studying critical discourse. Thirdly, the Habermasian conceptualization of the creation, normalization, and application of knowledge provides a conceptual model for knowledge management issues related to organizational dynamics. Fourthly, the conceptual linkages that the HIS develops between Habermas' rationalities and research paradigms present a practical way of applying philosophy to the classification and design of knowledge management research. All four contributions stem from the development of an internally coherent framework, with consistent definitions, discourses, and concepts.

5. Conclusion

This paper reports on the development of a Habermasian Inquiring System as a general framework for knowledge management research by synthesizing the elements of Churchman's inquiring systems and Habermas' critical social theory. The HIS is built upon Habermas' three knowledge-constitutive interests, and is incrementally developed by integrating four design elements: (1) Habermas' three rationalities; (2) Churchman's roles; (3) knowledge dynamics; (4) research paradigms. The HIS is grounded in philosophy, operationalized in organizational settings, and instantiated by knowledge dynamics. It is therefore potentially useful for research design.

By synthesizing systems thinking and critical thinking, the HIS provides a philosophically grounded, universally pragmatic framework for studying complex knowledge-related phenomena. It contributes to the conceptual integration of research on knowledge management by presenting a consistent view in terms of definitions, discourses, and concepts.

These contributions make an initial contribution toward alleviating the difficulties described in Section 2. Further research is required to test the usefulness of the HIS by applying it to knowledge management research. One avenue that is currently under investigation is a survey of the knowledge management literature. [48] This research seeks to demonstrate that the HIS is useful in classifying current knowledge management research, and in providing a critique to guide future research.

References:

[1] D. T. Croasdell, M. Jennex, Z. Yu, T. Christianson, M. Chakradeo, and W. Makdum, "A meta-analysis of methodologies for research in knowledge management, organizational learning and organizational memory: Five years at HICSS," presented at 36th Hawaii International Conference on System Sciences, Hawaii, USA, 2003.

[2] B. Rubenstein-Montano, J. Liebowitz, J. Buchwalter, D. McCaw, B. Newman, K. Rebeck, and T. K. M. M. Team, "A systems thinking framework for knowledge management," *Decision Support Systems*, vol. 31, pp. 5-16, 2001.

[3] M. Alavi and D. E. Leidner, "Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues," *MIS Quarterly*, vol. 25, pp. 107-132, 2001.

[4] U. Schultze and D. E. Leidner, "Studying knowledge management in information systems research: Discourse and theoretical assumptions," *MIS Quarterly*, vol. 26, pp. 213-242, 2002.

[5] M. Shin, T. Holden, and R. A. Schmidt, "From knowledge theory to management practice: Towards an integrated approach," *Information Processing and Management*, vol. 37, pp. 335-355, 2001.

[6] M. Earl, "Knowledge management strategies: Toward a taxonomy," *Journal of Management Information Systems*, vol. 18, pp. 215-233, 2001.

[7] F. I. Dretske, *Knowledge and the flow of information*. Stanford, CA: CLSI Publications, 1999.

[8] M. H. Zack, "Managing codified knowledge," *Sloan Management Review*, vol. 40, pp. 45-58, 1999.

[9] N. Kock and R. McQueen, "Knowledge and information communication in organizations: An analysis of core, support and improvement process," *Knowledge and Process Management*, vol. 5, pp. 29-40, 1998.

[10]   R. E. Bohn, "Measuring and managing technological knowledge," *Sloan Management Review*, vol. 26, pp. 61-73, 1994.

[11]   B. Kogut and U. Zander, "Knowledge of the firm combinative capabilities and the replication of technology," *Organization Science*, vol. 3, pp. 383-397, 1992.

[12]   T. H. Davenport and L. Prusak, *Working knowledge: How organizations manage what they know*. Boston, Massachusetts: Harvard Business School Press, 1998.

[13]   W. Ulrich, "An Appreciation of C. West Churchman," vol. 2004: International Society for the Systems Sciences, 1999.

[14]   C. W. Churchman, *The design of inquiring systems: Basic concepts of systems and organizations*. New York, NY: Basic Books, Inc., 1971.

[15]   R. O. Mason, "A dialectical approach to strategic planning," *Management Science*, vol. 15, pp. 403-414, 1969.

[16]   R. O. Mason and I. I. Mitroff, "A program for research on management information systems," *Management Science*, vol. 19, pp. 475-487, 1973.

[17]   I. I. Mitroff, J. Nelson, and R. O. Mason, "On management myth-information systems," *Management Science*, vol. 21, pp. 371-382, 1974.

[18]   W. Ulrich, "The design of problem-solving systems," *Management Science*, vol. 23, pp. 1099-1108, 1977.

[19]   J. F. Courtney, D. T. Croasdell, and D. B. Paradice, "Inquiring Organizations," *Australian Journal of Information Systems*, vol. 6, pp. 3-14, 1998.

[20]   E. G. Herrscher, "Design of the modern inquiring system, Part VI, Hermann Hesse (1877-1962)," *Systems Research*, vol. 6, pp. 267-270, 1989.

[21]   P. E. Pavesi and P. E. J. Pavesi, "Design of the modern inquiring system, Part V, Etienne Bonnot de Condillac (1715-1780)," *Systems Research*, vol. 6, pp. 176-178, 1989.

[22]   P. E. Pavesi and P. E. J. Pavesi, "Design of the modern inquiring system, Part VII, Ramon Lull (1232-1315)," *Systems Research*, vol. 9, pp. 85-92, 1991.

[23]   J. L. Snell, "Design of the modern inquiring system, Part IV, Warren S. McCulloch (1898-1969)," *Systems Research*, vol. 5, pp. 359-361, 1988.

[24]   J. P. van Gigch, "Design of the modern inquiring system, Part I, R. Descartes (1596-1650)," *Systems Research*, vol. 5, pp. 267-269, 1988.

[25]   J. P. van Gigch, "Design of the modern inquiring system, Part II, The contemporary computer," *Systems Research*, vol. 5, pp. 269-271, 1988.

[26]   J. P. van Gigch, "Design of the modern inquiring system, Part III, A. L. C. Destutt de Tracy (1714-1836) and the idealists," *Systems Research*, vol. 5, pp. 357-359, 1988.

[27]   J. P. van Gigch, "Design of the modern inquiring system, Part VIII, Symbolism and Ernst Cassirer (1874-1945)," *Systems Research*, vol. 7, pp. 298-301, 1990.

[28]   J. P. van Gigch, "Design of the modern inquiring system, Part IX, Erwin Schrodinger (1887-1961) and the role of theory in discovery," *Systems Research*, vol. 10, pp. 81-85, 1993.

[29]   J. P. van Gigch, "Design of the modern inquiring system, Part X, The interplay of theory and experiment in science from Thales (600 B.C.) to Higgs (21st Century)," *Systems Research*, vol. 10, pp. 97-101, 1993.

[30]   J. P. van Gigch, "Design of the modern inquiring system, Part XI, Richard Feynman (1918-1988); The changing role of explanation in modern science," *Systems Research*, vol. 10, pp. 73-78, 1994.

[31]   J. D. Haynes, "Churchman's Hegelian inquiring system and perspectival thinking," *Information Systems Frontiers*, vol. 3, pp. 29-39, 2001.

[32]   S. M. Richardson and J. F. Courtney, "A Churchmanian theory of knowledge management system design," presented at 37th Hawaii International Conference on System Sciences, Hawaii, USA, 2004.

[33]   E. B. Swanson, "Churchman's theory of design integrity," *Interfaces*, vol. 24, pp. 54-59, 1994.

[34]   J. P. van Gigch, "The paradigm of the science of management," *Interfaces*, vol. 25, pp. 81-88, 1995.

[35]   G. Burrell, "Modernism, postmodernism and organizational analysis 4: The contribution of Jurgen Habermas," *Organization Studies*, vol. 15, pp. 1-19, 1994.

[36]   J. Habermas, *The theory of communicative action Volume 1: Reason and the rationalization of society*. Boston, MA: Beacon Press, 1984.

[37]   J. Habermas, *The theory of communicative action Volume 2: Lifeword and system*. Boston, MA: Beacon Press, 1987.

[38]   R. Cooper and G. Burrell, "Modernism, postmodernism and organizational analysis: An introduction," *Organization Studies*, vol. 9, pp. 91-112, 1988.

[39]   K. Lyytinen and R. Hirschheim, "Information systems as rational discourse: An application of Habermas's theory of communicative action," *Scandinavian Journal of Management*, vol. 4, pp. 19-30, 1988.

[40]   J. Mingers, "Combining IS research methods: Towards a pluralist methodology," *Information Systems Research*, vol. 12, pp. 240-259, 2001.

[41]   M. D. Myers and L. W. Young, "Hidden agendas, power, and managerial assumptions in information systems development: An ethnographic study," *Information Technology & People*, vol. 10, pp. 224-240, 1997.

[42]   O. K. Ngwenyama, "The critical social theory approach to information systems: Problems and challenges," in *Information systems research: Contemporary approaches and emergent traditions*, H.-E. Nissen, H. K. Klein, and R. A. Hirschheim, Eds. Amsterdam: North Holland, 1991, pp. 267-280.

[43]   O. K. Ngwenyama and A. S. Lee, "Communication richness in electronic mail: Critical social theory and the contextuality of meaning," *MIS Quarterly*, vol. 21, pp. 145-167, 1997.

[44]   J. Habermas, *Knowledge and human interests*. Boston: Beacon Press, 1968.

[45] W. Ulrich, "A philosophical staircase for information systems definition, design, and development: A discursive approach to reflective practice in ISD (Part 1)," *Journal of Information Technology Theory and Application*, vol. 3, pp. 55-84, 2001.

[46] J. D. Sterman, "Learning in and about complex systems," *Reflections*, vol. 1, pp. 24-51, 2000.

[47] J. Mingers, "More dangerous than an unanswered question is an unquestioned answer: A contribution to the Ulrich debate," *Journal of the Operational Research Society*, vol. 56, pp. 468-474, 2005.

[48] Z. Guo and J. Sheffield. " A paradigmatic and methodological examination of KM research: 2000 to 2004. Proceedings of the Thirty-Ninth Annual Hawaii International Conference on System Sciences. January 2006.