EMPLOYING THE AGENCY/STRUCTURE DEBATE AS AN INTEGRATIVE FRAMEWORK FOR KNOWLEDGE MANAGEMENT RESEARCH

The agency/structure debate is used as the basis for building a conceptual lens through which to view various streams of information systems research. This lens is then applied to develop an integrative framework for knowledge management systems research. Implications for knowledge management systems researchers and practitioners are explored.

Overview

Within the management literature, the agency-structure debate has its origins in parallel philosophical discussions of free will versus determinism. This has had an implicit yet important effect on much of knowledge management systems (KMS) research. Structure and agency are generally considered to be opposites. Emphasis on structure implies a dominant role for technology but often a reduced role for the social actor, while an emphasis on agency implies a dominant role for the social actor and a reduced role for technology. These conceptualizations of agency/structure represent extreme views of the interacting role of the individual/group and IT in knowledgeable practice.

Although the agency/structure distinction often goes unrecognized by organizational scholars and social theorists the implications are far reaching since the position one takes within this debate indicates the relative importance placed upon human action or external forces. Furthermore, there is a growing awareness that such ‘either/or’ distinctions may in fact be a false dichotomy and that alternate conceptualizations are possible that provide a middle ground between these two extremes. In this regard, thinkers such as Anthony Giddens have explored various ways to resolve, at least partially, this debate. While the implications are far reaching for management research in general, the focus of this paper is on the knowledge management systems research. The remainder of the paper is organized as follows. First, the agency-structure debate is positioned within the management literature and Giddens’ position on this debate is explored. Second, the agency-structure debate is used as the basis for a conceptual lens on information technology use. Third, this lens is employed to demonstrate how disparate streams of knowledge management research can be viewed as different positions around a common research agenda: exploring the interaction between structuring technology and the free and knowledgeable agent. We demonstrate where various areas of knowledge management systems research are positioned on an agency/structure framework, and how this affects the conceptualization, implementation and investigation of various knowledge management systems. Finally, the implications for practitioners and researchers are discussed. We show how various disparate fields of KMS can learn and share knowledge with each other, and how researchers can continue working towards a cumulative tradition around a revised and generalized topic.
The Agency versus Structure Debate

The agency-structure debate deals with the extent to which the activities and behaviors of individuals are determined by larger social forces (Schneider 2002). Often at one extreme in the debate is structural determinism, where the individual agent’s actions are determined by structure (extreme structure), while at the other end is the view that humans have an almost unlimited capacity to do otherwise (extreme agency). The implications of this debate are far reaching for management researchers since one’s position influences the definition of the subject matter and the analytical and methodological terms under which it is to be investigated (Reed 1997).

Various literatures have been addressing agency/structure for some time. For example, within the organizational theory literature, this takes the form of an ongoing debate over the role that efficiency and flexibility play in organizational design. On the one hand it is argued that efficiency and flexibility are mutually exclusive while on the other that they are compatible (Newell, Huang et al. 2003). A similar debate exists surrounding managerial versus professional practice whereby management objectives are seen to be incompatible or at odds with professional requirements (Cooper, Hinings et al. 1996). These arguments often assume dichotomous either/or distinctions and parallel the debates over the role of structure and agency in organizations.

While this dualism can be useful as an analytical tool, it is the problems that arise from the agency-structure dualism that serve to motivate the current discussion. Strong deterministic views tend to deny the role of choice in human action and this in turn devalues the causal position that this action plays in organizations. Structures appear to shape human action while being impervious to change by that action; this makes dealing with and understanding how change occurs particularly problematic (Sewell 1992). Consequently, scholars have attempted to address this debate by exploring the relationship between agency and structure in order to provide a more equitable treatment of this important issue.

Anthony Giddens has grappled with this dichotomy in a number of works (Giddens 1979; Giddens 1984; Giddens 1991) owing to the complexity and importance of the issue. For Giddens, structure is defined as rules and resources, recursively implicated in the reproduction of social systems. Structure exists only as memory traces, the organic basis of human knowledgable and as instantiated in action (1984, p. 377). Agency implies the ability to do otherwise and in this respect is the power to make a difference to a preexisting arrangement (1984, p. 14). The relationship between agency and structure is redefined in terms of the ‘duality of structure’, which implies that structure shapes people’s practices, but these practices reciprocally constitute and reproduce these structures. Since agents are knowledgeable and enabled they can choose to enact structures in new ways. In this way their action can contribute to transforming the very structures that informed their action and result in the creation of new structures.

In summary, the duality of structure contributes new insights into how to deal with key problems that arise from their separation. In particular, Giddens provides an articulation of the reciprocal relationship between agency and structure. The next section explores the agency-structure debate within the context of the knowledge management systems literature.
Building a Conceptual Lens on KM Research

The agency/structure debate can be used as the basis for a conceptual lens on knowledge management systems research. That is, knowledge management systems research can be viewed in terms of where along the dimensions of agency and structure the research focus falls. For the purpose of analysis, we consider what is often an implied conceptualization of agency/structure within knowledge management to build the framework. In this regard, the role of the end user in knowledge management processes is presented as agency on one axis, and on the role of the technology in knowledge management processes is conceptualized as structure on the other axis. In both cases, the amount of structure and agency can be set as high or low in any particular circumstance. Low structure suggests that the technology provides limited structural constraints on the knowledge management processes, while high is an indication that the technology limits considerably the knowledge management processes to defined parameters. The role of the end user in knowledge management is similarly denoted from low to high, with low indicating that the individual is passive and uninvolved in the knowledge management processes, while high indicates that the user has full control over those processes. This is graphically presented in Figure 1.

Figure 1. Conceptual Framework for Knowledge Management Systems Research

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<th>Role of End User in Knowledge Management</th>
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<td>Role of Technology in Knowledge Management</td>
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Within the knowledge management context, agency is conceptualized as the role of the end user in the knowledge management processes while structure is conceptualized as the role of technology in knowledge management processes. The resulting matrix allows for the classification of research based upon where they are positioned relative to the two dimensions. The utility of this conceptual framework is explored in the next section, within the context of existing classification models of knowledge management and knowledge management systems.
Employing the Conceptual Lens to Integrate KMS Research

There have been a number of attempts at classifying knowledge management and knowledge management systems. An overview of the frameworks applicable to knowledge management systems research is presented in terms of knowledge management and knowledge-based systems.

Knowledge Management

Michael Earl developed a taxonomy of knowledge management strategies to guide executives on their choice of whether to pursue a knowledge management initiative based upon an assessment of key project characteristics (Earl 2001). Varun Grover and Thomas Davenport provide two complementary frameworks of knowledge management (Grover and Davenport 2001). The first considers the knowledge processes in play and the context in which these processes are embedded while the second considers knowledge from a transactional perspective, where knowledge exchanges are considered to occur with a marketplace. Andrew Gold et al. present a framework for effective knowledge management based upon a perspective of organizational capabilities (Gold, Malhotra et al. 2001). The authors explore the role of knowledge infrastructure (technology, organizational structure and culture) and knowledge process architecture (acquisition, conversion, application and protection) as preconditions to effective knowledge management.

Knowledge Based Systems

Marc Meyer and Kathleen Curley provide an early connection between expert systems and knowledge based systems by developing a framework to be used to evaluate a broad range of expert systems based upon two dimensions of complexity: (1) the complexity of the underlying knowledge residing with key experts and (2) the complexity of the technology incorporated into a given system (Meyer and Curley 1991). The resulting 2x2 matrix allows for the classification of the complexity of advanced information systems. Jasbir Dhaliwal and Izak Benbasat point to the connection between artificial intelligence research and knowledge based systems by building on the notion that such systems should provide explanations to the end user (Dhaliwal and Benbasat 1996). Narasimha Bolloju et al. connect knowledge management to the decision support literature by providing a framework for building decision support systems based upon knowledge repositories (Bolloju, Khalifa et al. 2002). Brent Gallupe provides a framework of knowledge practices for knowledge management systems along two dimensions: (1) process to be supported (problem recognition or problem solving) and (2) class of problem solved (new/unique or previously solved (Gallupe 2001). Based upon this 2x2 matrix various types of knowledge management systems are identified based upon these intersecting objectives.

The purpose of these frameworks is twofold. First, recognizing the types of knowledge management and knowledge management systems provides guidance to those building or deploying knowledge management initiatives. Second, identifying gaps in the research that have not been explored or have received limited attention is important. The knowledge management frameworks highlight the importance of recognizing knowledge processes while the knowledge-based systems frameworks point to the connection between emerging knowledge management systems and the technologies that preceded them.
However, while these frameworks do an important job of classifying the various knowledge management processes and technologies based upon what makes each different, they focus primarily on the generalized technological capabilities. As a result, they provide little guidance on underlying theory-based similarities and differences. In order to inform future KMS research, there is a need for an theoretically integrative framework of knowledge management systems that compares what have so far been considered to be disparate information technologies, and therefore research agendas on knowledge management processes and technologies.

As noted above, knowledge management systems are generally perceived as being related to other technologies, but the nature of these connections has received little attention within the information systems literature. Recognizing these connections can help us build a cumulative tradition (Keen 1980), and help in the development of missing and considerable practical understanding already established in these constituent and related areas of research. The analysis presented here is not intended to be an exhaustive compilation of the bodies of research that inform or constitute KMS research. Instead, the purpose is to provide an overview of these areas and to examine how an agency/structure framework can cast a new and integrative view on the various strands of knowledge management systems research.

A number of technologies have been identified as tools to support knowledge management systems, including intranets, information retrieval programs, database management systems, document management software, groupware, intelligent agents and expert systems (Gallupe 2001). For brevity the list is reduced here to intelligent agents, expert systems, repositories, and decision support systems. Intelligent agents extract knowledge from databases based upon data analysis and data mining techniques (Bose and Sugumaran 1999); expert systems encapsulate expert knowledge so that novices can perform near expert levels, or at least not like novices (Meyer and Curley 1991); repositories are often considered as a core technology for knowledge management systems since the include database facility, search capabilities and typically are deployed over intranets (Gray 2001); and decision support systems provide features of expert systems but play a support role in decision making, with the final decision and course of action remaining within the purview of the individual or group (Bolloju, Khalifa et al. 2002). Knowledge management systems typically facilitate a range of modes of operation, often drawing upon the systems identified above or an entirely new mode of operation where a new relationship between the user and the technology emerges. Table 1 provides a summary of this analysis.

### Table 1. Characterizing Various Informing Streams of Knowledge Management Research

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<td>Low</td>
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<tr>
<td>Intelligent Agents</td>
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<td>Expert Systems</td>
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<td>Repositories</td>
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<td>Decision Support Systems</td>
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<td>Knowledge Management Systems</td>
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Using the agency/structure framework, various technologies associated with particular research streams of KMS can be compared. Broadly categorized, intelligent agents are viewed as low agency since there is very little end user involvement within the regular operation of the agent while there is high structure since the intelligence of the agent is embedded within the technology. Expert systems are considered to be at a medium level of agency since the end user provides only limited guidance within the knowledge management processes since these processes are again embedded within the technology, thus the high level of structure. Repositories, as a core technology, provide the opportunity to be employed as static knowledge bases for explicit data within the organization, in which case there is only moderate room for individual agency but can also be used to support higher agency levels when used more dynamically in knowledge management processes. The repositories generally impose significant structure when implemented as a structured database but there is considerable flexibility in how those databases can be employed in practice. Decision support systems generally provide for significant individual agency in that the final decision remains with the person using the system so that they have considerable control over how the knowledge management processes are enacted in practice. The underlying technologies of decision support systems typically rely on aspects of agent or expert systems and consequently impose moderate levels of structure. Finally, knowledge management systems can potentially provide for considerable human agency, leaving the knowledge management processes entirely at the discretion of the end user while imposing little in the way of structure on those processes. The classifications presented in Table 1 are generalizations, which are intended only to position the research so that similarities and differences among the various streams can be identified.

If the analysis from Table 1 is superimposed on the conceptual framework presented in Figure 1, patterns within the collective body of research addressing KMS can be identified. This builds upon the work of Meyer and Curley (1991) by extending their classification scheme, which was based upon dimensions of complexity, to the agency/structure debate. This is shown in Figure 2.

Figure 2. Positioning Various Informing Streams of KMS Research

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<th>Role of End User in Knowledge Management</th>
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<td>Agency</td>
<td>KMS</td>
<td>DSS</td>
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<tr>
<td>Low</td>
<td>Repositories</td>
<td>Expert Systems</td>
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<td>High</td>
<td>Intelligent Agents</td>
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The above framework illustrates how various approaches to KMS research emphasize different agency-structure positions, thus contributing uniquely but synthetically to our understanding of KMS. At one end there is a strong emphasis on knowledge management processes being embedded directly in technology with little intervention required from the end user. The middle ground between agency and structure is occupied by a technocentric view of
knowledge management but there is considerably more latitude for individual agency within the knowledge management processes. At the other extreme lies the knowledge management systems that provide for considerable autonomy in enacting knowledge management processes with very little structure imposed in practice. However, this likely represents an ideal type with knowledge management systems providing at least some structural constraints.

The real contribution of this framework is its integrative capacity since viewed through the conceptual lens presented, what at first appear to be disparate knowledge management research streams can instead be viewed as variations on the agency/structure theme. Furthermore, if agency/structure is considered to be reciprocally related as purported in the ‘duality of structure’ concept, then the structures embedded within the technology can be considered in terms of the individual agent enacting those structures in practice while recognizing their capacity to do otherwise.

The next section explores the implications of this framework and extensions beyond it from Giddens dissolving of agency/structure divides, in building a cumulative tradition in various approaches to knowledge management research.

**Implications for Knowledge Management Researchers and Practitioners**

It would appear that the framework presented above endorses the agency/structure distinction, which Giddens points to as a false dichotomy and expends considerable effort in trying to resolve the dualism. However, it is argued here that dualisms are not inherently problematic or to be avoided. In fact some researchers view dualisms as beneficial and suggest that by ‘dissolving’ the dualism between agency and structure we have weakened the explanatory power of organizational analysis (Reed 1997). The position purported in this paper is consistent with Giddens’ message that dualisms can be useful analytical tools. However, we also need to move beyond exclusive either/or dichotomies in order to take full advantage of agency-structural positions in KMS research.

In this regard, by employing the duality-of-structure concept from Giddens’ structuration theory, the structural constraints of the technology are not independent of the agent’s actions, but are produced and reproduced by these agents when they use the technologies within their organizations. As a result, agents can choose to do otherwise and enact new structures within the technology, and by rejecting it.

For knowledge management researchers if the focus of the research tends to one of the extreme views of agency or structure then a key dimension of social activity is missed. For example, studies of intelligent agents, expert systems and repositories, with too strong an emphasis on technological structure, can potentially slip into a strong technological determinism that will be unable to explain individual shifts in action that alters what appeared to be a hard-coded knowledge management process. Similarly, decision support systems and knowledge management systems research risk social determinism if it emphasizes the individuals’ completely free action, while ignoring the social-material reality of the technology. This is
represented on Table 1 through the dashed boxes to denote areas of potential extreme forms of agency or structure.

Thus our framework, while providing a useful analytical tool to highlight the issues of extreme technological and sociological positions in KMS research, in practice the relationship between individual action and technological structure needs to be studied as a reciprocal relationship of structural choice and change. That is, even when technological structures are generally considered to be independent of individual agents, structural appearance still relies upon agent acceptance. Likewise, agent action that appears independent and free of technological structure is still conditioned and shaped by various work, customer and technological demands that prompt particular behavioral patterns.

For practitioners, this suggests that any comprehensive knowledge management initiative will be a combination of the various technology-based approaches to knowledge management while recognizing that knowledge management practices are socially more than the information technological parts – except in those rare cases where they are automated by IT. The reciprocal relationship between the two suggests that knowledge management requires an understanding of existing knowledge management practices and then specific technologies can be introduced and promoted to be consistent with those practices or aimed at changing them.

**Conclusions**

The above discussion on the agency/structure debate suggests that various approaches to KMS research emphasize agency or structure in understanding the knowledge management problematic. The framework presented allows KMS researchers to more adequately articulate the reciprocal relationship between structure and agency and build upon currently disparate research areas that contribute to a cumulative tradition.

In many ways this research highlights one of the key challenges of knowledge management systems in practice, that is, identifying and then making use of opportunities for sharing and knowledge transfer. As pointed to here, researchers may view areas of research as disparate, unless provided with appropriate tools that theoretically guide the connections and thus open opportunities for sharing and knowledge transfer. This approach already has a foothold within the IS field.

Shoshana Zuboff points to the interplay between agency and structure in the form of informing versus automating (Zuboff 1988). In many respects the framework presented here is an attempt to organize the knowledge management literature around the middle ground between these two extremes. Similarly, within the knowledge management literature, emerging discussions on investigating technologies in tandem with the intent of simultaneously addressing needs of efficiency and flexibility (Newell, Huang et al. 2003) represent research consistent with the call here on two fronts. First, from a methodology point of view addressing research on systems in tandem recognizes the interconnected nature of knowledge management systems. Second, the attempt to balance efficiency and flexibility parallels the discussions here on agency
and structure, with efficiency being viewed as requiring structure and flexibility requiring agency. Furthermore, attempts at connecting areas of research such as knowledge management systems and decision support systems is evidenced in integration attempts based upon emergent knowledge processes (Markus, Majchrzak et al. 2002). In fact, these emergent knowledge processes represent another unifying possibility and while the framework presented in this paper recognizes these processes it does not explicitly incorporate them within the framework. This may represent an opportunity to extend the framework in future research.

A consideration and reconciliation of agency and structure also opens up new possibilities for KMS research by allowing researchers to explore the various sources and changes in agency and structure across different settings and circumstances. For example, strong views of agency during early stages of IT development can be compared with stronger views of structure as the technology emerges in an organization (Chiasson 2002). Longitudinal and institutionally embedded approaches to IT development could show how structural properties of the IT were the result of the designers agency (Orlikowski and Robey 1991). The role of conflict and power in the development of IT may be considered within structure-agency frameworks (Chiasson and Dexter 2001), given the productive view of power in Giddens’ writings. On the other hand, power may also point to other political and sociological approaches, like those of Foucault, which examine the emergence of discourses and organizing visions (Swanson and Ramiller 1997) that direct broad areas of KMS activity.

References


