# Communicated Collective Knowledge: Realizing Human Potential Through Social Cognition And Information Integration Processes

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ABSTRACT:

Firms are struggling to manage knowledge, a growing source of competitive advantage. Intellectual capital often lies dormant without the needed systems and processes to realize its potential. Despite years of work in this area, organizations still struggle to find ways to harness this resource. Better strategies are needed to transform it into *communicated collective knowledge* that move the firm toward its goals. This paper explores knowledge management from a cross-disciplinary perspective. Borrowing from strategic management, organizational behavior, social cognition, leadership, and organizational communication theories, an inclusive model is developed. The interdependence of the organizational communication system with metacognitions, transactive memory systems (TMS) and cognition scripts provides a unique view of the process. Guidelines are provided that are suggested by the model to guide practitioners in creating efficient and effect communication systems that support the social cognitions necessary to convert dormant human knowledge into a realized asset -- *collective communicated knowledge*.

Keywords*: Knowledge management, Social cognition, Information integration, Communicated collective knowledge*

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## 1. Introduction

**"Communicated knowledge is viewed as probably the single most important source of competitive advantage into the 21st Century" (Tucker et al., 1996, p. 58).**

The Information Age has ushered in a new conceptualization of organizations. The need to incorporate human resources and capabilities, especially specialized employee knowledge into the strategic management of firms has grown in emphasis as the shift from a manufacturing to a knowledge based economy has occurred. This paradigm shift has lead to various knowledge based theories of the firm (Grant, 1996; Spender & Grant, 1996) and in the growing interest in "knowledge management". The globalization of firms has only increased the need to manage the knowledge resources as organizations now span not just countries, but continents. Large expenditures are being made by firms to gather, store and make available for retrieval large quantities of information in an effort to "manage knowledge". Unfortunately, the return on the investment is often not realized. The expense of setting up the system, training employees in its use, motivating acceptance and commitment to the system, and maintaining the system are misguided efforts based on the assumption that the

accessibility to information will lead to collective utilization and synergistic outcomes. More and more firms understand that information systems are not "knowledge systems", and that technology is but a tool to support the more dynamic and organic nature of collective knowledge. A critical factor in knowledge management that is foundational but seems to evade us in practice is how to most effectively mobilize collective human knowledge toward a productive end. As we strive to better understand this dynamic it may be helpful for various fields of study to share their own knowledge bases as well. This paper addresses this problem by looking at the cognitive and communications literature and proposing how these concepts can help guide us in the knowledge management arena. Understanding how information is systemically integrated, processed and then communicated at the individual level can guide us in understanding how to harness this resource and expand it at the group and organizational level. To understand knowledge management and create better systems in organizations, we must understand how individuals, groups and firms process and integrate information into communicated knowledge.

Information technology provides a "technological repository of knowledge" for the firm (Wright et al., 2001), but knowledge evolves from actors and the interactions of actors within the firm. Strategy literature has emphasized the content and flow of knowledge for competitive advantage, but has under explored the role of individuals and collective knowledge generation (Spender, & Grant, 1996; Wright et al., 2001). The process of "knowing", deciding, creating, and integrating information to more effectively and efficiently achieve common organizational goals is the critical missing link. Knowledge management relies on the human cognitive dimension supported by organizational communication systems. Information content and flow and information systems are simply outputs of their efforts and technology a tool to increase efficiency.

Wright et al. (1994) and Wright & McMahan (1992) propose that it is not the organizational practices or processes that are the source of competitive advantage because they can be imitated over time, but rather the human capital pool. This paper takes this thesis a step further to suggest that human capital is dormant until the interactive information processing of individuals, groups and intra-firm units, supported by organizational communication systems occurs. That is, it is the dynamic, or organic process of human interaction and interdependence that creates the competitive advantage, not the human capital per se. The purpose of this paper is to use the theoretical backdrop of the knowledge-based view of the firm, organizational communication theory and social cognitive theory applied to group information processing models to propose a critical humanistic view of knowledge management.

## 2. Knowledge-Based View Of The Firm Revisited

The resource-based view (RBV) of the firm is a well established strategic management perspective (Barney, 1991) and proposes that sustained competitive advantage is obtained through capabilities and resources that are valuable, rare, nonimitable and non substitutable. The RBV shifted the emphasis of strategic management away from an external focus (how the firm positioned itself within the environment and met environmental threats and opportunities) to an internal focus (how firm resources can create a sustained competitive advantage) (Wright et al., 2001). Nordhaug and

Gronhaug (1994) argue that individuals within a firm possess different competencies that they refer to as a "portfolio of competence". They propose that a core or distinctive competence exists when a firm is able to collaboratively blend the many competences in the "portfolio", through a "shared mindset", to perform better than their competitors. This process is otherwise known as knowledge management.

The knowledge-based view as an outgrowth of the resource-based view "focuses knowledge as the most strategically important of the firm's resources". (Grant, 1996). In fact, Grant suggests that knowledge is the rationale for the existence of the firm. Unlike others in the knowledge-based view area (Spender, 1996), Grant does not equate this view with the process of collecting organizational knowledge but rather that the firm is an institution of knowledge integration (Grant, 1996). As such, his conceptualization of the knowledge-based view is most consistent with the model presented in this paper. He does not deny the role of organizational context in knowledge management, but sees the process as founded on individual level specialized knowledge which is incrementally built into group and firm level knowledge.

The assumption of the knowledge-based view is that the outcome of the knowledge management system is greater than that which could be realized by the individual or group(s) in isolation. That is, the output of the effective integration of information by a group will exceed that expected by the individuals acting alone; likewise, the integration of the groups' information within a firm using effective and efficient systems will exceed that of the groups acting in isolation. Emphasis is placed here on the words effective and efficient. Tucker et al. (1996) proposed that effective and efficient organizational communication systems should lead to superior organizational performance founded on internal strategic capabilities related to knowledge. However, their model centers on the communication process and exchange and does not precisely define what would make a communication system efficient or effective. This paper incorporates a key component, that of effectiveness, which centers on the social cognition and information integration process of individuals, groups and firms. Knowledge or a "portfolio of competence" (Nordhaug & Gronhaug 1994), is an unrealized source of human capital (whether at the individual, group or intragroup level) unless an interdependent process of social cognition and communication occurs.

## 3. Organizational Communication Theory

Knowledge management depends heavily on organizational communication. Systemic organizational communication is more than the encoding-transmission-decoding paradigm, more than the information and technology support systems, and more than the specific patterns and processes of exchanging information, it is the way that individuals interact and integrate information both in isolation and collectively to arrive at effective knowledge in an efficient manner that will most successfully move them toward a common goal. Organizational communication is a dynamic process and this paper suggests that it is the supporting foundation that accounts for the efficiency of knowledge management. The open systems theory and the information processing theory of organizational communication are two relevant theories that although presented separately, are not distinct and have many elements in common. Church

(1994) uses these theoretical frameworks and others within the field of organizational communication to develop an integrated Content, Process, Roles Model of organizational communication which can provide a more in-depth look at theories of organizational communication. However, a more parsimonious theoretical perspective provides incremental insight into how knowledge is efficiently managed to create a positive outcome for the firm.

### 3.1. Open Systems Theory

The open systems theory (Katz & Kahn, 1978) is not specifically a communication theory, but fundamentally relies on communication or coordination of information within a system to explain organizational activity. The theory suggests that organizations function within a cyclical conversion process whereby inputs are transformed into outputs. Koehler et al. (1981) suggest that communication is the source of coordination and transfer that is necessary for the cycle to function. This conversion process is based on both the information content and the process of communicating among individuals that must occur within the system (Tucker et al., 1996). The theories' relevance to this paper's premise is the systemic nature of information processing and the critical function that a strong organizational communication system plays in the conversion process within organizations. This theory has been used to explain conversion of any input (raw material) into outputs for the organization, but when the inputs and outputs are information or knowledge, the importance of the transformation process becomes quite complex, i.e. how do individuals transform their specialized knowledge into a collective knowledge that moves the firm toward its objectives? The open systems theory provides the theoretical framework that supports the systemic nature of the communication component and the interdependence of the individuals processing functions.

### 3.2. Information-Processing Theory

A related theory that delves further into the conversion issue is the information processing theory (Galbraith, 1973, 1977). It was originally developed as a theoretical framework for organizational development related to matrix-based organizations. The theory has evolved over time into a major perspective on social and organizational communication, although not a communication theory per se, it is deeply rooted in the social interaction of actors to gather and interpret information with the goal of converting them into outputs for the organization. In fact, Galbraith (1973) defines organizations as social systems that evolve to gather and interpret information about the environment. The theory suggests that communication is "the primary means of information processing within the system, given the need for considerable interdependence and coordination among individuals and groups" (Church, 1994, p. 25). The emphasis is on the paths of information exchange and the information capacity of the organization. Network Analysis is an example of application of this framework. The focus on the path or process of information flow in the system provides insight into the interaction patterns of individuals as information is moved throughout the system.

This perspective provides support for the premise that organizations are information processors that rely on organizational communication systems and it goes further to suggest that capacity to process and flow of information are key aspects of how this system works. However, the theory does not explain *how* the information is actually processed, but mainly focuses on the path of information flow, uncertainty reduction and various levels of information processing requirements based on tasks (Rice & Shook, 1990). Information processing theory supports the paths of information flow and the need for information capacity within the individuals and groups in the organization, but it does not attempt to explain what occurs to integrate the information that is moved through the system. The missing component is the social cognitive integration of information into knowledge. What occurs when individuals and groups interact to integrate information and convert it into collective knowledge that is greater than the sum of the individual components, --that is: "communicated collective knowledge"?

### 3.3. Knowledge-Based Approach Through Communication

Tucker et al. (1996) present a theoretical model that builds on organizational communication and links it to the knowledge management paradigm. They show how "knowledge creation and communication are the foundations of the new organizational form" and provide the capability to create a sustained competitive advantage. Te model Tucker et al. (1996) build on an organizational communication foundation as a means to develop internal knowledge bases that can ultimately impact the performance of the firm. They propose that financial performance will be positively related to effective and efficient communication systems. More specifically they argue that firms with effective and efficient organizational communication systems will perform better financially, have greater internal strategic capabilities, have enhanced shared experiences, increase the exchange of objective information, have a greater ability to serve external markets and will pursue more effective strategies. Although these arguments seem reasonable, they fail to clearly define efficient and effective communication or how the individuals within an organization interactively accomplish this goal. The Tucker et al. (1996) model describes in detail how tacit and objective information flows from the individual to the collective level. It incorporates the importance of shared meaning, institutional processes and structures, and leadership. Their model essentially moves from the foundation of organizational communication systems to firm resource development to "internal strategic capabilities based on knowledge".

Grant (1996) also argues that coordinating the integration of specialized knowledge requires routines, rules, sequencing, and matching the degree of integration within the system to the requirements of the task or situation. He further argues that the coordinating system (communication system) needs "common knowledge" which is shared language, symbols, commonality of specialized knowledge, shared meaning and recognition of others domains. Thus, both Tucker et al. (1996) and Grant (1996) provide critical details related to the organizational communication systems required for knowledge management, but do not address the cognitive integration components.

According to the communications perspective, specialized knowledge (human capital) as a potential resource is present at the individual, group and firm level. Each level is incrementally built upon the other, but information at this stage is not shared between levels. That is, different knowledge is possessed at each level, but there is no coordinating communication system to integrate these knowledge sources. They are essentially dormant. The organizational communication system provides the systemic support for the integration of dormant knowledge into communicated or "realized" knowledge. The organizational communication system is a cyclical, comprehensive system that promotes shared meaning and information integration through culture and norms, organizational structures, processes, rules and routines, social networks, common referents, accessibility, technology systems and leadership. Task context or situations will moderate the level of specialized knowledge incorporated into the organizational communication system and the social cognitive integration processes that are triggered. More complex tasks will involve more dynamic integration of knowledge between levels.

In summary, the theoretical foundations in organizational communication suggest that information or knowledge is managed via the communication system, whether that system's function is to reduce uncertainty, provide a path for information, coordinate interactions, or provide a cohesive "knowledge" culture. This paper argues that the specialized knowledge and potential of employees, groups and firms is not realized until it is moved through the cognitive processing component.

## 4. Social Cognition And Information Integration

Morgan (1986) presented the idea of organizations as "brains" or information processing centers. Expanding upon that idea, the ability to develop communicated collective knowledge rests on social cognition and information integration. The social cognitive process is the means of achieving effective communicated knowledge; the communication system is the means of assuring efficiency. However, the systems are interdependent and certainly not distinct functional units. The following sections borrow from cognitive and social psychology theory and provide the foundation for the major contribution of this paper's model to the understanding of knowledge management, that is, how is information integrated effectively and efficiently into knowledge that is systematically and consistently supported over time.

### 4.1. Social Cognition

Social cognitive theory states that individuals exist within a comprehensive reality. This reality involves cognition, motivation and situation (Fiske & Taylor, 1984). The field of cognitive science has increasingly been applied to organizations and groups. The process of encoding, storage, and retrieval of information involved in cognitive processing are thought to be applicable at the individual, group and intragroup level (Hinsz et al., 1997). That is, individual information processing principles have subsequently been applied at the group and intragroup level. The individual knowledge builds into group knowledge and these same metacognitive processes can be analogously applied to intragroup interactions within the firm. Thus, just as individuals collaborate as groups to develop knowledge, so too groups collaborate with other

groups within the firm to collectively integrate information using social cognitive principles.

Social cognition incorporates not only the cognitive components, but also the motivational or affective and situational components as well. Steiner (1972) speculated that the potential output of a group is moderated by process losses. That is, productivity is simply the sum of the potential of each member of a group minus process loss. Process losses are of two types: coordination losses and motivation losses. The first relates to loss of potential based on inefficient systems and the latter deals with the affective dimension of the actors. Both coordination and motivation are proposed to be supported by the components within the organizational communication system, i.e. leadership, culture, organizational structure and processes and social networks. In the realm of knowledge management, we can envision the potential coordination process losses from technology issues such as incompatible computer networks or inconsistent comfort level with software programs. Coordination process loss is also seen when expected outcomes, available resources and division of labor are unclear. Likewise, we see motivation process losses with poor leadership vision and support or competitive corporate climates that discourage information sharing. Thus, the components of the organizational communication system are interdependent with the group social cognitive systems.

Hinsz et al. (1997) in supporting the role of group information processing proposes that norms, culture, shared reality/meaning, situational variables, rules, routines, and leadership are important determinants of the way groups integrate knowledge. Thus, the social cognitive literature and the communication literature agree that the processing of information has both a cognitive and affective dimension and that the situation or task is also important. The model presented in this paper is incremental with each level (individual, group and firm) of social cognitive processing building upon the next and each is dependent upon the effectiveness and efficiency of the other levels. The interaction of these social cognitive processes with affective dimensions such as motivation within a social/contextual environment is how communicated knowledge in organizations is generated. Those organizations that can build the organizational information systems that support these social cognition and information integration systems are at a unique advantage.

### 4.2. Metacognitions

Metacognitions involve an overarching theory of how individuals understand cognition. That is, “what people know about the way they process information” (Hinsz, et al., 1997, p. 58). Applied to groups, it is what individuals within the group understand about how the group integrates information into knowledge, and at the intragroup level is how a group perceives the information integration system among groups within the firm. Grant (1996) discusses how transferring knowledge is not synonymous with integrating knowledge. Thus, studies of capacity or flow of information, although important, do not explain knowledge generation among multiple individuals. To achieve integration of knowledge requires group cognitions. Group cognitions require shared mental models or related collective cognitive representations (Hinsz, et al., 1997). One can envision that leadership and organizational norms and

culture are key components of how organizational members develop a shared vision and create consistent mental models or representations of what the firm knows and where or with whom important information can be found. The accuracy and consistency of these shared mental models between members of a group and between groups in an organization facilitate effective and efficient interaction and knowledge generation. Wegner's (1995) transactive memory systems is a means to achieve this goal consistently and over time.

A transactive memory system (TMS) is not a new concept in knowledge management of groups. Transactive memory (Wegner, 1987) is an example of a group metacognition that has been shown to improve group productivity and performance (Austin, 2000, 2003; Hollingshead, 2000; Kanawattanachai, & Yoo, 2007; Lewis, 2004; Stasser et al., 1995). It is a group metacognitive process that builds on the findings that group memory processes are superior to individuals on many tasks because the memory is "group size times larger than the individual" (Hinsz, 1990). TMS have been defined as the "shared division of cognitive labor" with respect to memory function (Hollingshead, 2000). For a comprehensive review of the literature on TMS from 1985 to 2010 see Ren and Argot (2011).

Hollingshead (2000) found that groups utilizing TMS outperformed those that do not. TMS (Wegner, 1987) are the group sharing of the cognitive act of encoding, storage, retrieval and communication of information. Encoding involves identifying each member's area of expertise and then systematically funnelling information to that person or group. The expert is then the storage vehicle for the group or firm and is accessible to the other members. Members are then aware of where the information is stored within the system and can access it as needed. The process is "transactive and depended on the continuous negotiating, communicating and coordinating of implicit information regarding the encoding and assignment of responsibilities of expertise domains so that the information the group needs is always encoded and stored with at least one of the partners" (Rulke, & Rau, 1997, 349-350). In contemporary firms, information technology supports the organizations knowledge storage and communication functions. Choi et al. (2010) found that in knowledge management systems much of the effect of the information technology systems on knowledge sharing and knowledge application was mediated by TMS.

TMS requires a system to connect knowledge held by each individual with knowledge held by others in the team and requires a shared conceptualization of where knowledge is distributed among the group members as well as how to access this knowledge (Wegner, 1995). Hollingshead (2000) argues that convergent expectations and cognitive interdependence is what leads to transactive memory and not just shared experiences or relationships. Convergent expectations involves the accurate and shared perception by members of how their own knowledge differs from that of other team members while cognitive interdependence is related to the reliance of members on others for the cognitive resources required to perform at their highest level. Hollingshead (2000) also argued that the incentive system will impact transactive memory. Incentives for knowledge integration and for differentiation of knowledge will increase performance. Thus, within the organizational context, a supportive organizational communication system can facilitate the consistency of expectations of

individuals and groups and can be a means for the development of interdependent systems.

The positive effects of TMS on groups are powerful yet fragile. Leadership must support the system and facilitate a climate where knowledge integration is valued and rewarded (Peltokorpi & Hasu, 2011). Leaders must nurture it especially through the transformational processes of individualized consideration, where open communication and relationship is encouraged; inspirational motivation, where passion for a clear vision is formed; and intellectual stimulation where followers are encouraged to seek new knowledge and expertise. Other organizational dynamics can also play a role. Ellis (2006), for example, found that acute stress significantly decreased the effect of mental models and TMS on team performance.

### 4.3. Cognitive Scripts

Along with metacognitions and TMS, cognitive scripts are yet another component of social cognition and information integration that help conceptualize how collective knowledge is developed and communicated. Cognitive scripts encompass information about context and "sequentially ordered knowledge" necessary to interact in a particular situation or concerning a particular organizational problem and many types have been incorporated into our understanding of organizational behavior (Mitchell et , 2000; Gioia & Poole, 1984). Leddo & Abelson's (1986) three general stages of cognitive scripts help to illustrate how social cognitive concepts relate to collective knowledge integration. These three are arrangements scripts willingness scripts and ability scripts (Leddo & Abelson, 1986). These scripts can be conceptualized at individual, group and intragroup levels.

Arrangement scripts are related to how an individual assesses their personal and situational resources constraints. Arrangement scripts are the "I/we have the cognitive and other resources to succeed" component (Leddo & Abelson, 1986, p. 121). They are "the knowledge structures individuals have about the use of the specific arrangements that support their own performance and expert-level mastery in a given domain". (Mitchell, et al., 2000, p.977). The arrangement script concept is likely to impact self-efficacy (Gist & Mitchell, 1992). Self-efficacy is the belief and expectation an individual has about their capabilities. Collective efficacy is the individual's beliefs about the capabilities of the group to which they belong (Eden, 2003). Stasser et al. (1995) found that *group* performance was positively affected by knowledge of other *group* members' expertise and not affected by knowledge of one's own expertise. These findings suggest that both self and collective efficacy can be applied to the group level. That is, within the knowledge system of the organization, the individual has cognitive scripts or beliefs about their expertise and capabilities and that of their work units; the group also collectively has a general efficacy belief about the functional capabilities of the group and about the larger organization. Consistency and positive efficacy beliefs at the individual, group and intragroup levels are argued to be strong predictors of effective information integration processes. Such beliefs are thought to generate trust, increase motivation and support group cognitions. Trust is a key factor in the ability of groups to develop group metacognitions and motivation has been identified as a moderator of group performance (Steiner, 1972). Thus, increasing

the individual and group awareness, belief and trust that the knowledge resources exist within the individual, group, or firm (arrangement scripts) is an important basic criteria for knowledge management.

Willingness scripts are knowledge structures that underlie the individual or groups commitment to act. Willingness scripts are the "I/we have the willingness to succeed" component (Leddo & Abelson, 1986, p. 121). These include the level of opportunity seeking, commitment tolerance and action commitment (Mitchell et al., 2000). These scripts provide the proactive force and initiative to pursue new knowledge and to extend the effort to integrated collective knowledge. These scripts are also related to affective dimensions such as trust and motivation. These scripts incorporate important components of leadership, culture and values into the knowledge management process. They are the means by which individuals embrace the goals and want to pool intellectual resources towards synergistic ends. Again, the transformational leadership aspect of inspirational motivation and intellectual stimulation can be facilitating forces in creating these scripts.

The final script type is the ability scripts and they are "knowledge structures that individuals [or groups] have about the capabilities, skills, knowledge, norms, and attitudes required of a task or problem" (Mitchell et al, 2000, p. 978). The ability scripts are the "I/we know how to put resources, specialized knowledge and willingness into action" component (Leddo & Abelson, 1986, P. 121). Leddo and Abelson (1986) consider ability scripts necessary for "the enactment of individual plans: the doing of the expert function". These are the beliefs of the individual, group or firm that they can perform. These scripts have also been linked to efficacy measures.

In summary, the social cognition and information integration process which are supported by the communication systems of the firm is the key to converting the dormant human capital into a competitive advantage. The individual, group and intragroup cognitions are the force that drives the effectiveness of the process. Individual and group metacognitions as well as individual and group cognitive scripts provide insight into how information is integrated by organizational members and groups to achieve higher levels of functioning. Building upon the foundations of the knowledge-based view of the organization, organizational communication theory and social cognition and information integration, an integrative model is presented.

## 5. Communicated Collective Knowledge

The following model is a building of concepts from a cross-disciplinary analysis of the literature and it borrows from a variety of frameworks and theoretical foundations. The purpose of reframing ideas from knowledge management, information systems, organizational behavior, human resource management, strategic management, leadership, social cognition, and organizational communication is to attempt to blend a diverse set of ideas about knowledge management into a model that might serve to guide the activities of those in organizations who are striving to maximize the *communicated collective knowledge* that is realized in their firm. Our organizations often spend large sums to create technologically complex systems and to hire the brightest talent so as to harness the intellectual capital. Yet, failure to address

knowledge management from a comprehensive perspective often leads to less than optimal results.

The model presented in Figure 1 shows the connection of the unrealized potential or dormant specialized knowledge (human capital) feeding into the organizational communication system. The specific level of input (individual, group or intragroup) from this dormant resource is determined by the situation or task and is supported by components of the communication system that facilitate information integration. The components of the organizational communication system that are most conducive to the information integration function are listed in the model and based on the group cognitive processes and communication theories discussed in this work. Thus, group cognitions are interdependent on supporting systems and structures, rules, routines, leadership, norms, culture, common referents (language, meaning, and symbols), accessibility, social networks and technology that are found within the organizational communication systems.

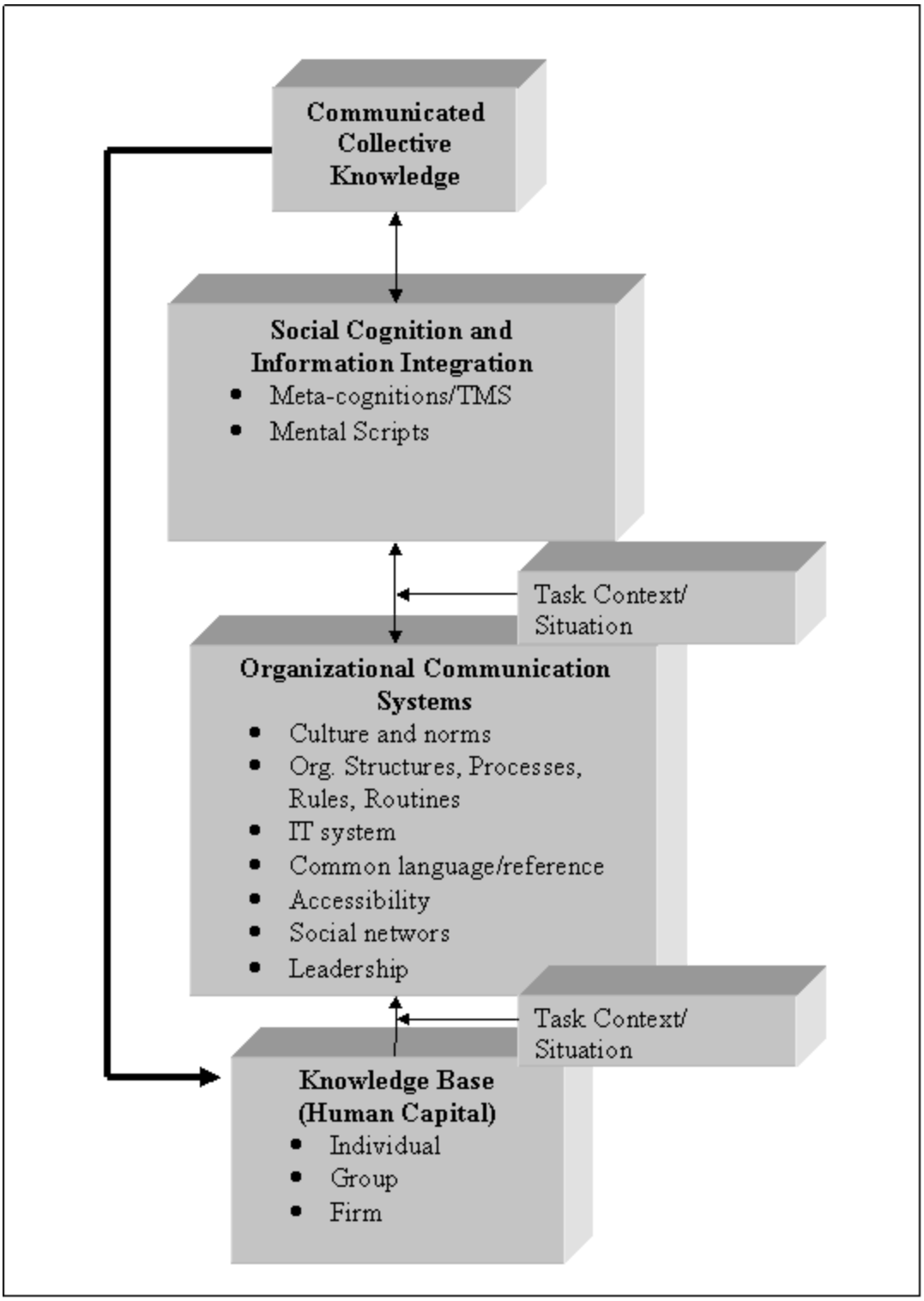
Communicated Collective Knowledge
Social Cognition and Information Integration
Meta-cognitions/TMS
Mental Scripts
Task Context/ Situation
Organizational Communication Systems
Culture and norms
Org. Structures, Processes, Rules, Routines
IT system
Common language/reference
Accessibility
Social networs
Leadership
Task Context/ Situation
Knowledge Base (Human Capital)
Individual
Group
Firm

**Figure 1**

The model then shows the dominant nature of the social cognitive processes and information integration functions within the model. The dormant specialized knowledge within the human capital and the organizational communication systems are not going to achieve the effective and efficient realized or communicated knowledge unless some key integration occurs. This key is found within the social cognitive integration component previously described - metacognition/TMS and cognitive scripts. It is important to note the dynamic nature of the organizational communication system and the social cognitive information integration. These components are interdependent and moderated by the task or situation. That is, a complex task will incorporate high degrees of organizational information systems and social cognition relationship. However, more routine tasks may not incorporate or need all of the components within the communication system.

The outcome or dependent variable in the model is the effectiveness and efficiency of the interactive processes which is labelled *communicated collective knowledge*. Ray et al. (2004) argue that when studying the resource based view of the firm, an appropriate dependent variable may be the effectiveness of a business process rather than overall performance of the firm. The later may often result in information being hidden within aggregated unrelated factors especially in large multi-divisional firms. The effective outcome of this model is *communicated collective knowledge* and this is theorized to be a valuable, nonimitable, rare and nonsubstitutable capability of a firm. The term "communicated" implies that the dormant specialized knowledge of the firm is actively triggered into productive knowledge that leads to effective action.

A final component of the model is the feedback loop of *communicated collective knowledge* back to the stored or dormant specialized knowledge of the firm and back to the stored social cognitions and TMS. This dormant knowledge is then available as raw components to re-activate the entire knowledge system. Linking back to cognitive scripts, once communicated collective knowledge has occurred it becomes a source of arrangement, willingness and ability scripts and is stored in TMS for the future. Although in reality the system is in constant cycle. The knowledge base or human capital component of the model should be conceptualized as the raw knowledge resource that is required as input to activate the interdependent organizational communication and social cognition and information integration systems.

## 6. Conclusions

For any model to add value, it must link theory to practice. To that end, the following practical guidelines are derived from the model for leaders in knowledge management to consider. Throughout this paper, the need for those involved in this process to serve as leaders in the process is emphasized. Using transformational leadership principles to drive the systemic and cognitive requirements are key.

A systems approach to organizational communication is essential. The system must have at a minimum a means to store and disseminate information and as is the case with most organizations today, this will be technology based. Of obvious importance is the need for all to understand the system and its language and be capable users. However, beyond the IT components of the system, the high performing communication system incorporates many organizational behavior concepts. Strong transformational leadership support that builds trust, motivation and encourages the pursuit of knowledge and learning is key. Leaders must also incorporate norms, culture, organizational processes and structures, rules and routines that are conducive to shared knowledge. For example, highly competitive incentive programs that breed conflict and mistrust will often build a barrier to the best technologically sound communication infrastructure. Finally, the system must incorporate a common language or use understandable referents and be accessible through key networks throughout the organization. Leaders need to investigate whether the necessary communication networks are intact and if they are being utilized. Leaders involved in implementing and monitoring these systems should routinely explore each of these dimensions to assure they are in place and effectively supporting the process.

Leaders in this process should also consider the social cognitive processes and metacognitions/TMS that guide communicated collective knowledge. Leaders must build awareness of knowledge capabilities within the group or firm (arrangement script), motivate through personal inspiration and organizational reward systems the willingness to share knowledge (willingness scripts) and assure that employees have the competence to work in a collaborative way and that they have the skills to implement the collective ideas that are generated (ability scripts).

Finally, knowledge management leaders must assure that the successful realization of *communicated collective knowledge* is analysed, recorded, stored and disseminated so that it can be replicated and so that it can serve as a source for ongoing learning for the organization. When things go right, the system should record who knew what, who did what and where to go the next time that information is needed. Leaders can accomplish this through rewards, acknowledgements, and selective assignments. Cultures can reinforce through stories or organizational communications about the successful projects. Or, this process can be done in a formal record keeping system through electronic information systems that can be accessed when needed.

The model presented in this paper attempts to fill the gap in the literature related to how organizations develop efficient and effective communication systems that result in knowledge capabilities. It borrows from the knowledge-based view, organizational communication theories, as well as social cognition and group information integration theories. Previous research has suggested that knowledge may be the single most important asset a firm can possess. Theories of the firm suggest that communication is a critical component of how knowledge is managed within the firm. However, there is little discussion about what occurs within and between individuals and groups within the firm that results in this outcome. What is the mechanism of integration? This model proposes it is an interdependent system that links specific organizational communication systems and social cognition and information integration. Theory suggests that certain elements within the organizational communication system will

better support the social cognitions and group information integration processes required to convert dormant human capital into a realized asset, collective communicated knowledge.

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