Taxonomy of Knowledge Creation Process by Organization Type: Are Some Types of Organizations Better Equipped to Convert Tacit/Explicit Knowledge?

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Abstract

This is a research in progress to understand the various stages involved in knowledge creation and transfer. We believe that by depicting these stages, managers will improve their use of information and thereby positively influencing their judgments and decisions. The literature addresses various aspects of the fundamental questions about how organizations create, retain, and transfer knowledge. The creation of knowledge involves the conversion, sharing and combination of tacit and explicit knowledge. Finally, this study integrates theories of knowledge creation, knowledge management, and organizational learning to better understand the process of knowledge creation in organizations.

Keywords: knowledge creation, knowledge conversion, knowledge transfer, taxonomy

Introduction

Does knowledge creation process differ between organizations? Are there characteristics that can be used to classify the knowledge creation process in organizations? Studies about organizations indicate two dominant sources of knowledge: tacit and explicit (Polanyi, 1966). Tacit knowledge resides in the experience and expertise of individuals and explicit knowledge is codified as artifacts, rules, and routines. The emerging literature in several academic disciplines on knowledge management (Argote, Ingram, Levine and Moreland, 2000; Argote, McEvily and Reagans, 2003; Cohen and Sproull, 1996; Helfat, 2001; Spender and Grant, 1996) indicates that the properties of knowledge, units, relationships and the environment predict firms' outcomes. Further, this literature addresses various aspects of the fundamental questions about how organizations create, retain and transfer knowledge (Nonaka, 1994). Therefore, it is essential for researchers to understand the processes of knowledge creation: the different ways organizations create knowledge and the similarities and differences between the processes used in organizations. Understanding the similarities and differences of organizational knowledge creation process will contribute to our combined knowledge to advance organizational learning. This study borrows from the theories of knowledge creation, knowledge management, and organizational learning to understand the process of knowledge creation in organizations.

This paper is a research in progress that centers on knowledge creation defined as recombining old knowledge to produce new knowledge (Lapre and van Wassenhove, 2001; Uzzi and Lancaster, 2003). The creation of knowledge involves the conversion, sharing and combination of tacit and explicit knowledge. Knowledge conversion may take the form of tacit to tacit, tacit to explicit, explicit to explicit, or explicit to tacit (Nonaka and Toyama, 2003). This research contributes to the

extant knowledge in organizational learning by hoping to extend the knowledge creation theory to include the effect of organizational types as shown in Figure 1. This helps researchers and practitioners focus on knowledge creation process that is optimal for a specific organizational type.
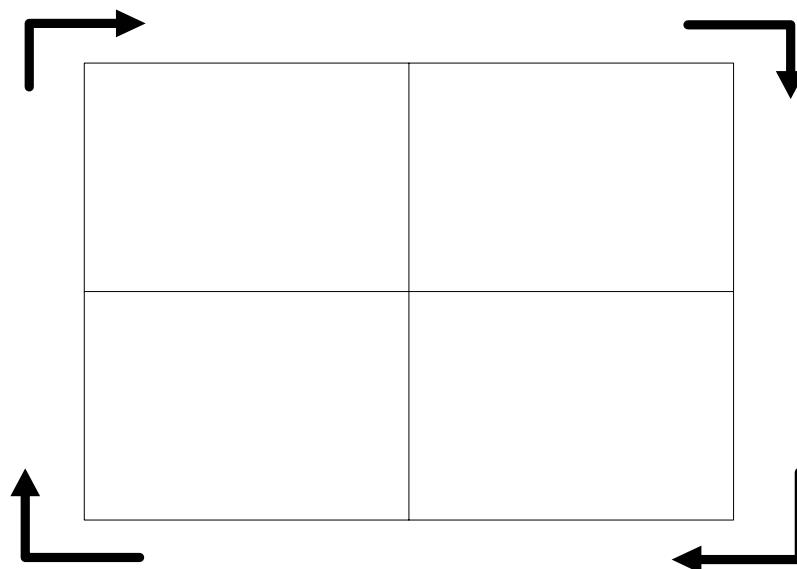

Figure 1: Knowledge conversion taxonomy by organization type

Organizational learning is encoding inferences from history into routines that guide behavior (Levitt and March, 1988) and building on past knowledge and experience (Stata, 1989). Learning histories help in transferring knowledge and in building generalizable knowledge (Kleiner and Roth, 1997). Experience is considered to be the best teacher (Kleiner and Roth, 1997). Drucker (1993) posits that we are now in a post capitalist society in which knowledge and creativity have replaced labor and capital as the source of value. And today a corporation's success depends more on its intellectual and systems capabilities than on its physical assets (Quinn et al., 1996). Knowledge is a sure source of lasting competitive advantage (Nonaka, thus understanding its creation in different organizations is important. Understanding the differences and similarities of knowledge creation in organizations helps researchers create taxonomies for knowledge creation. Learning organizations are skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights (Garvin, 1993). Scholars have defined organizational learning as the process of improving actions through better understanding (Fiol and Lyles, 1985), changing potential behavior through information processing (Huber, 1991), and a process of detecting and correcting errors (Argyris, 1977). Nonaka and Takcuchi (1995) presented a framework delineating the knowledge conversion processes in organizations. This model was later revised and presented by Nonaka and Toyama (2003), see Figure 2.

The model in Figure 2 specifies that tacit knowledge can be converted from existing tacit or explicit knowledge and explicit knowledge can be converted from existing tacit or explicit knowledge. Our research extends this theory by studying the differences and similarities of knowledge creation in organizations.
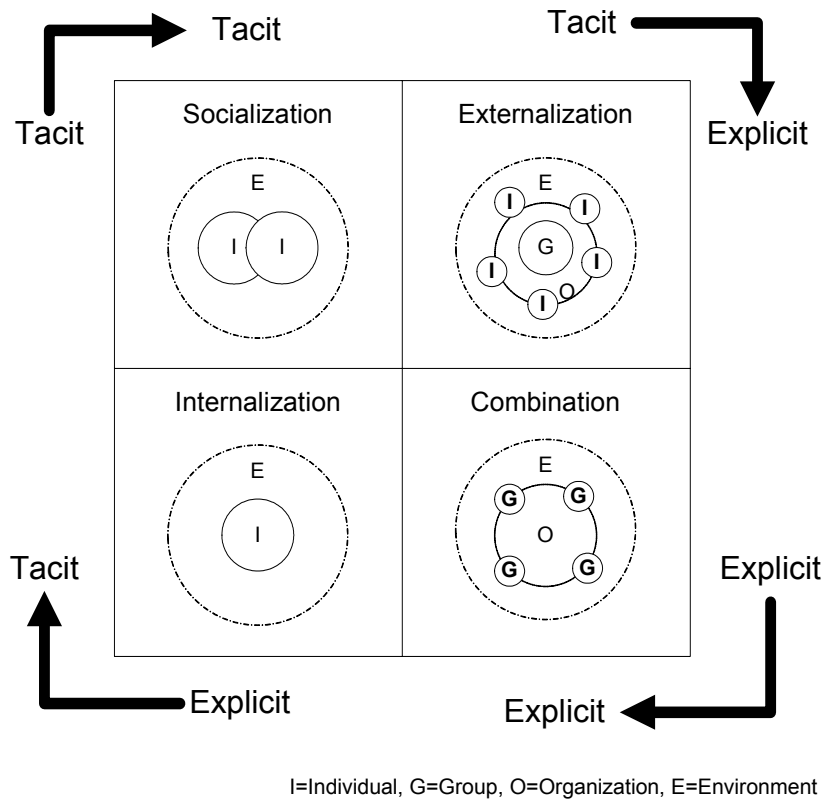
Tacit → Tacit   Tacit →

Tacit   Explicit

Socialization	Externalization
E	E
I I	I G I
Internalization	Combination
E	E
I	G G O G G

Tacit   Explicit

Tacit ← Explicit   Explicit ← Explicit

I=Individual, G=Group, O=Organization, E=Environment

Figure 2: Theory of Knowledge Creation by Nonaka and Toyama (2003)

Methodology

Initial study: We begin by studying two information-based organizations. The results of the initial inquiry will be used to document how each organization creates knowledge. Instrument development: The results of the initial study will be used to develop an instrument to test the similarities and differences of knowledge creation in organizations. Follow-up study: In the follow-up study additional organizations will be identified, we will study the process of knowledge creation in each organization. Instrument validation: based on the follow-up study we will validate the instrument. The resulting instrument will be used to document an initial taxonomy of knowledge creation by organization type. Full study: The validated instrument will be used to gather information from a larger sample of organizations. The results of the full-study may lead to the development of the proposed knowledge creation taxonomy by organization type, see Figure 1.

Initial Study

Knowledge based organizations create explicit knowledge by linking disparate information. Organizations often do not have a documented process for how their organizations create knowledge. To document the knowledge creation process in organizations, to provide a basis for a larger study, and to begin the process of developing taxonomy for effective organizational knowledge creation, this study begins by investigating the knowledge creation process of two knowledge-based organizations: TIPS and City Police. Both organizations acquire disparate information from citizens/informants and develop a profile to identify perpetrators. Pseudo names are used in this paper to protect the identity of participating organizations.

Three consecutive studies and instrument development steps will be used as described in the methodology section. TIPS uses 1-800 number to collect anonymous crime tips from citizens. Informants from the 50 states of the United States call the 1-800 number and provide tips. The headquarters of TIPS is located near a metropolitan area with access to over 10 million people within 40-mile radius. City Police provides services for 200,000 day residents in its city. It uses telephones, mail-ins, and walk-ins to collect service request for crime and city infrastructure maintenance. City Police is located near a metropolitan

area with over 5 million people within 40-mile radius. Some of the characteristics for the two organizations are shown in Table 1.

Table 1: Similarities and differences of participating organizations

	City Police	**TIPS**
Organization Type	Information-based	Information-based
Reach	Regional	National
Technology	Has established advanced technology	Only basic technologies
Collaboration	Collaborative community	Silos of agencies
Socialization	Established mentoring program	No formal socialization program
Externalization	Has semi-structured externalization process	No formal externalization program
Combination	Robust information system	Basic databases, no pattern recognition
Internalization	Semi-structured internalization process	Semi-structured internalization process

TIPS receives over 25,000 tips annually and has a database with over 394,000 tips. These tips have resulted in 15,000 solved cases and nearly 8,000 convicted criminals. TIPS has also helped in recovering $314 million dollars in drug seizures, $7 million in cash seizures, and $17 million worth in stolen property. TIPS has collected over 2,800 crime tips committed against financial institutions. These tips have assisted in solving more than120 bank robberies, in one case a tip resulted in $40,000 reward to the informant.

New officers at City Police are assigned a mentor, a senior officer with expertise, for at least six weeks. The senior officer uses observation and evaluation to assess the new officer's progress. The mentoring period ends with a written examination to confirm that the new officer has acquired the tacit knowledge needed for the job; the new officer then begins her/his individual assignment. Once on the job, police officers use information systems to log their daily findings. City Police processes varied information types to prevent crime and to protect citizen's safety. The information system used by City Police is a collaborative effort by five adjoining communities expanding the visibility for police investigations. A local university manages City Police's information system.

Anticipated results

Organizations need to have processes in place to validate the knowledge they discover, else they will risk operating under miss-guided knowledge. This research will conduct a series of studies to understand if the knowledge creation process is influenced by organization type; since we hypothesize that organization type may guide the knowledge creation process.

The study also seeks to understand the role that information technologies play in the knowledge creation process. Understanding the knowledge creation taxonomy may help organizations in their selection of information technologies. Information technologies have become a critical factor of organizational knowledge creation (Nobeoka and Baba, 2001). Pattern recognition applications (e.g. data mining) help individuals to combine seemingly disparate pieces of explicit knowledge into a new whole (Nonaka, 1991). Technology helps in expressing the human oriented knowledge into a systematic-rationality-oriented model (Nobeoka and Baba, 2001). Technology can provide visualization, seeing the entire form of the component; it also helps in communication and coordination that determines the effectiveness of its participants (Nobeoka and Baba, 2001). Technologies help to generate a unified explanation from unstructured set of alternatives (Nobeoka and Baba, 2001) and create new knowledge by linking disparate information.

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