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The Underlying SccoB Processes: knowledge mapping and micro analysis

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ABSTRACT
The SccoB process is an organization knowledge creation process that governs the exploitory and exploratory processes of the firm in a manner that is balanced and complementary. The underlying SccoB processes provide a KBS development strategy and a knowledge mapping process that leads organizations to greater congruence. This entails the conduct of knowledge micro analysis and the development of the HTKB. The paper proposes that the structuring cause emits and leaves behind a wealth of knowledge that can be used to elevate the firm through better governance of its business processes and greater tact in their conduct.

KEYWORDS: Knowledge mapping, Knowledge-based systems, and Knowledge management

INTRODUCTION
At the 2012 DSI conference in San Francisco, a distinguished scholar of the decision sciences told us, when the topic turned to knowledge management, that it was dying, or something similar. In response it was stated that knowledge management was only beginning, and the distinguished scholar smiled. Sensing his curiosity an explanation was about to be delivered when dinner was served and our attention turned elsewhere, and this paper represents a more in depth reply to our beloved and esteemed scholar.

Over two decades ago research was undertaken to assess the impact of telemedicine on the medical diagnostic process, and the diagnostic process was studied at a behavioral, cognitive, and epistemological level. Beginning with Herbert Simon’s (1985) three stage model (intelligence, design, and choice), then adopting three forms of insight from cognitive psychology and three knowledge types from epistemology, the six diagnostic stages identified by the medical problem solving researchers were adapted to form the four-stage model of the medical diagnostic process. The aforementioned telemedicine research afforded us a tremendous opportunity to analyze the video recordings of teleconsultations between primary care physicians and medical specialists, and the four-stage model provided a helpful framework for analyzing these interactions. This video analysis revealed that a quick diagnosis of a complex medical problem occurred when the right combination of knowledge (the patient’s current medical condition, the patient’s medical history, and specialized medical knowledge of illness) was available.
From the aforementioned video analysis emerged the knowledge combustion and vehicle analogy and the introduction of the knowledge chemistry approach. This analogy used a well understood physical model to support understanding and communication of the role of knowledge in controlling intelligent behavior. Based on an understanding of the four stroke engine and its cycles, the 2004 knowledge combustion paper was extended in a recent paper. This recent paper (Randles, Miller, and Zhang, 2015) described a process (the SccoB process – pronounced Scoh-Bee) to integrate the exploratory and exploitory processes of a firm and is related to research being conducted in strategic management by Lavie, Stettner, and Tushman (2010).

Congruence relates to the level of agreement and consistency, and the underlying SccoB processes provide a KBS development strategy and a knowledge mapping process that lead organizations to greater congruence. This entails the conduct of knowledge micro analysis and the development of the hypothesis testing knowledge blend (HTKB). Initially, the HTKB will support the conduct of complex diagnosis. Then it will move to supporting complex but routine problem solving processes. The paper proposes that the structuring cause emits and leaves behind a wealth of knowledge that can be used to elevate the firm through better governance of its business processes and greater tact in their conduct. The paper suggests that knowledge management be viewed as a quality, human resource, project, and strategic management tool through the implementation knowledge micro analysis. Moment models, knowledge requirement fulfillment analyses, and knowledge forecasting would support quality, human resource, and project management, and, by elevating the organization to higher mapping levels, the underlying SccoB processes would also serve as a strategic management tool.

LITERATURE REVIEW

Beginning as a framework to assess the impact of telemedicine on the medical diagnostic process, the four-stage model was generalized and linked to a well understood mechanical process to improve our understanding of how knowledge enables intelligent behavior. Over many years these concepts have been extended resulting in the insights upon which this paper is based, and this stream of research is briefly described in the literature review.

The Four-stage Model of the Diagnostic Process

Building upon Simon’s (1985) three phase “intelligence-design-choice” decision making sequence, Randles and Thachenkary (2002) provided a four-stage model of the medical diagnostic process. Based on their understanding of the diagnostic milestones, forms of insight, and types of knowledge, the aforementioned authors proposed that medical diagnosis was a four-stage process with each stage relying on a different type of knowledge, attaining a different form of insight, and achieving a different diagnostic milestone. The foundation of the four-stage model was Dretske’s definition of knowledge. Dretske (1988) stated that behavior is a causal chain governed by three types of knowledge, with each knowledge type having a different role. The triggering cause is a summary form of knowledge signaling the presence of an external event. The role of the structuring cause is to motivate action by explaining the relationship between a signal and an external event. The third type of knowledge is described as a map, attached to a belief that guides one’s actions (Dretske, 1988).

The contribution of the four-stage model is that it described the role of different knowledge types and forms of insight in the achievement of various diagnostic milestones (framing, formulation,
testing, and confirmation), relating epistemological, cognitive, and behavioural aspects of the diagnostic process. Problem framing is the first diagnostic stage of the four-stage model. The problem framing stage relies on Dretske’s triggering cause and attains Sternberg’s (1987) selective encoding form of insight which identifies relevant information from a large amount of mostly irrelevant information. The second diagnostic stage, problem formulation is introspective, and a problem space map is generated. The hypothesis testing stage, which is the third stage of the four-stage model, requires traversing the problem space in order to select a diagnosis. This is done by comparing the diagnostic information collected to an expected pattern of facts. From this comparison, a judgment is rendered, and this corresponds to Sternberg’s (1987) selective comparison form of insight which relates information that is current to information acquired in the past. The fourth stage of the four-stage model is the confirmation stage, in which other illnesses that might not be readily apparent from the diagnostic evidence are considered. Confirmation requires Sternberg’s (1987) selective combination form of insight in which the relationship between seemingly unrelated things is determined. This requires the processing of a vast amount of textbook knowledge, which is embedded in the structuring cause (Randles and Thachenkary, 2002).

To test the validity of the four-stage model, Randles and Thachenkary (2002) studied the video recordings of teleconsultations and conducted telephone interviews with the consulting physicians. Their empirical evidence indicated that these stages have different information processing and knowledge requirements. Telephone interviews with the primary care physicians revealed that their average change in diagnostic confidence was 40% for teleconsultations conducted to make diagnoses and 18% for teleconsultations conducted to confirm diagnoses. This indicated that diagnostic confidence was inversely related to the size of the knowledge gap and that the successful processing of information and provision of explanations increased diagnostic confidence. The understanding of knowledge requirements and knowledge gaps, which was gained from this research, provided the basis of the knowledge combustion and vehicle analogy which is discussed next.

The Knowledge Combustion and Vehicle Analogy

Using descriptions of such engine components as the carburetor and piston, Randles and Fadlalla’s (2004) physical model analogy extended the four-stage model by linking cognition to a solid physical science. In their knowledge combustion and vehicle analogy, Randles and Fadlalla (2004) proposed that different knowledge types were required to extract value from information and to generate systematic action. Furthermore, their second proposition of knowledge chemistry stated that four different forms of knowledge combustion are conducted in different orders to permit the solution of myriad problems.

According to the knowledge combustion analogy, the cognitive equivalent of gasoline is a knowledge blend and Dretske’s three knowledge types are used in different proportions to create four knowledge blends. Generalizing the four stage model, Randles and Fadlalla (2004) stated that the four forms of knowledge combustion are common to all decision making. One form of knowledge combustion, formulation does not correspond to any form of insight but represents the planning processes that precede insight and action. The framing form of knowledge combustion corresponds to selective encoding, hypothesis testing corresponds to selective comparison, and profound explanation corresponds to the selective combination form of insight. Hence, each form of knowledge combustion requires a different knowledge blend, and the creation of these different knowledge blends required the development of a new approach which was called knowledge chemistry (Randles and Fadlalla, 2004).
According to the knowledge combustion analogy, action is controlled by two sets of cognitive processes that precede two emotions concerning knowledge and risk. These processes establish an action threshold and determine a decision maker’s confidence concerning the ability to make the correct decision. These control mechanisms do not contribute any cognitive force. However, in concert, they regulate action. Just as gasoline will not explode until its temperature reaches its ignition point, only when diagnostic confidence is above the action threshold will an action be performed voluntarily (Randles and Fadlalla, 2004).

**Hypothesis Testing Knowledge Blend (HTKB)**

From an understanding of knowledge based on the previously discussed research, specifically an understanding of the hypothesis testing task, a process was proposed which required: 1) the development of pragmatic rules that indicate what to say when, 2) the development of problem space and sub-state maps of medical diagnoses, 3) the development of a set of explanations that motivate physicians to adhere to the sub-state maps, and 4) the development of a system that provides the sub-state maps and communicates the explanations of specialists in a timely manner. These explanations would be captured from the video recordings of teleconsultations, and a process to transform the artifacts of the medical diagnostic process into valuable medical specialty knowledge was proposed (Randles, Blades, and Fadlalla, 2008).

The hypothesis testing task is information rather than knowledge-intensive, and the ability to collect and analyze this information (the procedural knowledge requirement) is great. However, procedural knowledge is required to combust the knowledge blend. It is not a component of the knowledge blend, and the creation of the HTKB avoids this stringent knowledge requirement. Furthermore, because hypothesis testing is structured and routine, the role of the structuring cause is limited. Only the appropriate explanation from a set of existing explanations must be presented, and, because of these factors, the HTKB is easily implemented (Randles, Blades, and Fadlalla, 2008).

**The Knowledge Spectrum and the Conceptualization of Cognitive Force**

The knowledge combustion and vehicle analogy explained how myriad decisions are made using three forms of insight, or knowledge combustion, and seven knowledge types (declarative knowledge, rules, signals, maps, technical knowledge, semantic knowledge, and structuring causes). As depicted in figure 1, these knowledge types and forms of insight form the basis for the knowledge spectrum and are placed on a continuum according to their: 1) explicitness (ability to be communicated), 2) technical feasibility, and 3) ability to generate cognitive force (Randles, Blades, and Fadlalla, 2012).

Like the table of elements in chemistry, the knowledge spectrum provides a great deal of information about knowledge. Although the knowledge spectrum provides a static view of knowledge, its underlying premises suggest that intelligent behavior requires the interaction of a number of knowledge types. To represent the dynamic nature of knowledge (the ability to generate cognitive force), the knowledge spectrum has been divided into sectors, based on the three forms of insight previously described. Hence, every location on the knowledge spectrum represents a specific combination of knowledge type, form of insight, and cognitive force based
on the function it performs. Furthermore, to provide a better description of technical knowledge, the human/machine and body/mind dichotomies were presented; the relation between knowledge types, technical feasibility, and cognitive force were discussed, and it was explained that it is the level of control and semantics that determines what is low, moderate, or exceptional regarding the intellectual (of the mind) aspect of a technical skill (Randles, Blades, and Fadlalla, 2012).

Regarding cognitive force, knowledge micro analysis focuses on knowledge interactions that occur in a moment’s time, and an objective of knowledge micro analysis is to show how cognitive force is generated. To accomplish this objective, the links between various knowledge types, representing the seven components of cognitive force, must be analyzed. The first three components: cohesion, coherence, and synergy form a summary measure. The other four components: complement, initiate, promote, and strengthen provide detail and permit a more in depth description of how cognitive force is generated. In addition to modeling knowledge interactions and measuring cognitive force, knowledge micro analysis has several other objectives which are to catalog the firm’s knowledge resources, determine business process knowledge requirements, develop benchmark measures of cognitive force, perform knowledge forecasts, and conduct knowledge requirement fulfillment analyses. Just as data flow and activity diagrams support efforts to improve information flow within an enterprise; the graphical and mathematical techniques of knowledge micro analysis should provide organizations with a closer look at their critical knowledge intensive business processes (Randles, Miller, and Blades, 2014).
The SccoB Process

In developing the SccoB process, narrow definitions of exploitory and exploratory were adopted from Lavie, Stettner, and Tushman (2010) with exploitation involving the use and development of things that are known and exploration involving the pursuit of new knowledge. The SccoB process extends the engine/vehicle analogy of Randles and Fadlalla (2004) integrating the cycles of the four-stroke engine (intake, compression, combustion, and exhaust) and the four stages of the diagnostic process (framing, formulation, hypothesis testing, and confirmation). This integrated model serves as the basis of the SccoB process which integrates the exploitory and exploratory processes of the firm in a complementary way. Furthermore, six desirable knowledge qualities are derived from this integrated model and are implemented by the SccoB process. These qualities are: 1) compartmentalization, 2) order, 3) balance, 4) completeness, 5) complement, and 6) relevance, and these desirable knowledge qualities are described by Randles, Miller, and Zhang (2015).

The SccoB process is an overarching process that is compartmentalized into a dozen challenging but manageable tasks. Each compartmentalized task requires different types of knowledge and expertise, and the SccoB process provides two perspectives. The internal perspective (the internal sub process) focuses on operational information and the identification and explanation of operational anomalies. The external perspective (the external sub process) constructs theories regarding critical events, develops search and response maps for plausible hypotheses, and conducts hypothesis testing in order to detect emerging critical events. With respect to the knowledge quality, balance, intake and combustion require an upward motion of the piston while exhaust and compression require a downward one, and the functions of the combustion process are balanced. The same is true for the SccoB process. The deep, focused analysis of the internal sub process is balanced by the environmental scanning of the external sub process (Randles, Miller, and Zhang, 2015).

The four stroke engine requires a mechanism to link the pistons vertically and horizontally, allowing the combusting piston to power the other three. Similarly, well-designed cognitive processes establish cognitive links between compartmentalized cognitive functions, and these links enable one cognitive function to power other cognitive functions. The SccoB process has links that represent the balance which is established between: 1) thought and action, 2) inductive and deductive processes, 3) intuitive and rational processes, and 4) broad and focused analyses. There are also links representing the four cognitive qualities (compartmentalization, order, completeness, and complement), which are implemented by the SccoB process. In addition to fostering the creation of an organization knowledge creation process, it is believed that understanding and establishing these links is critical to designing effective knowledge intensive organization processes (Randles, Miller, and Zhang (2015).

EXTENDING THE SCCO-B PROCESS

With respect to the SccoB process, the firm’s exploitory processes generate the information which is required to identify anomalies. However, to identify anomalies, knowledge of what is expected is also required. Establishing these expectations is the role of management, which defines expected outcomes over time, as well as for varied conditions, and this level of mapping is called codification. Expectations are established; their performance is evaluated, and based on these evaluations procedures are implemented.
The development of procedures manuals, standard operating procedures, best practices, and training programs to prepare and support agents of the firm in the conduct of business processes represent another mapping level called the procedural mapping level. These mapping levels (codification and procedural) represent existing (exploitory) mapping processes. Congruence relates to the level of agreement and consistency, and the underlying SccoB processes lead organizations to greater congruence by elevating the organization to higher mapping levels. To achieve these higher mapping levels, the underlying SccoB processes provide a knowledge mapping process and a knowledge-based system (KBS) development strategy that also serve as strategic management tools.

**SccoB as a KBS development strategy.**

An understanding of the four-stage model, the knowledge combustion and vehicle analogy, and the knowledge spectrum can provide many insights regarding the development of knowledge-based systems. In viewing the knowledge spectrum (figure 1), it is readily observed that the rules and maps of the HTKB are low level knowledge types. Furthermore, it can be readily observed that complex technical skills span a third of the spectrum (from its midpoint toward the structuring cause). We propose that knowledge-based systems development should move incrementally across the knowledge spectrum. At the beginning of the 21st century, the focus should be on developing maps of diagnostic problem spaces and sub-states, and the underlying SccoB processes implement a KBS development strategy to create the HTKB.

Because the problem space and sub-state maps of the HTKB are critical to the conduct of complex technical skills, the development of the HTKB should serve as a stepping-stone toward the replication of these complex skills. According to the composition property of knowledge, the knowledge spectrum’s higher order knowledge types are composed of lower order ones. For example, a map is composed of declarative knowledge, rules, and signals (Randles, Miller, and Blades, 2014). Consequently, in addition to implementing a continuous process of knowledge creation, the SccoB process implements a KBS development strategy that should lead to the development of systems that replicate progressively more complex knowledge types.

Another important insight about the development of KBS emerged through an analysis of over one hundred video recordings of teleconsultations between primary care physicians and specialists. The explanations of the specialists provide the most explicit aspect of the structuring cause – **which is the most powerful knowledge type**. It is this component of the HTKB that should enable it to generate a large cognitive force. This is because the power of explanations in the conduct of complex diagnoses is significant. While just simple words when extracted from a video recording, when placed in the appropriate context, these explanations become quite powerful and should improve diagnostic practices significantly.

For many years, knowledge acquisition has been a significant hurdle for knowledge-based systems developers, and the aforementioned telemedicine research suggests that organizations should provide specialist support via teleconferencing and use the video recordings of these teleconsultations to create the HTKB. Although video analysis has long been considered an excellent knowledge acquisition tool, it is considered intrusive. When providing support, it is not. This is a simple but important idea that should enable organizations to move to greater levels of congruence through the implementation of the HTKB.
**SccoB as a mapping process**

The SccoB process can be considered *just a way of thinking*. However, it is also a mapping process. In order to increase the firm’s agility, the SccoB process develops response maps which guide organization response to future critical events. Furthermore, the SccoB process is charged with the implementation of the aforementioned KBS development strategy and the development of HTKB problem space and sub-state maps. Finally, based on the explanation of anomalies, the mapping operations of the SccoB process will refine existing business process maps, moving the organization from the codification and procedural mapping levels to the governance level of mapping.

To enhance the knowledge mapping processes of the firm, the SccoB process will implement several tools of knowledge micro analysis which were proposed by Randles, Miller, and Blades (2014). For example, moment models would be used to depict the interactions of different knowledge types at a specific moment in time. These interactions would be described using ring links, links between similar knowledge type nodes (SKT links), and links between different knowledge type nodes (DKT links). According to Randles, Miller, and Blades (2014), the aforementioned nomenclature is succinct and should allow the representation and calculation of cognitive force for the firm’s critical, knowledge intensive processes.

Additionally, knowledge micro analysis would support the definition of business process knowledge requirements and the conduct of knowledge requirement fulfillment analyses, which were described by Randles, Miller, and Blades (2011). These analyses should reveal that errors in the conduct of business processes often stem from a failure to satisfy knowledge requirements. Consequently, the objective of knowledge requirement fulfillment analysis is to detect potential knowledge gaps and reduce their chance of occurrence. Hence, the SccoB process will serve as a knowledge management tool that supports the management of organization risk and quality. Furthermore, knowledge requirement fulfillment analysis would also be used to identify situations where the fulfillment of knowledge requirements is done by over qualified agents. Hence, these analyses will also support human resource and project management and will foster improvements in the firm’s knowledge resource usage, as resources are better aligned to requirements.

With ownership of and allegiance to their ideas, agents of SccoB’s internal and external sub processes will initiate and oversee the completion of mapping requests. Thus, the SccoB process provides the impetus and momentum required to complete these requests and move the firm to higher mapping levels. The SccoB process also governs these mapping processes. For example, preliminary (skeletal) response maps would only be developed for theories of anticipated critical events that have been selected for exploration by a large group of organization experts. Furthermore, only when empirical support is obtained would a skeletal response map be completed. Hence, the development of response maps is governed by the subjective assessments of organization experts and the empirical rigors of science.

Furthermore, working with the agents who construct the selected theories of future critical events, agents of the SccoB mapping subsystem would develop specifications (search maps) for implementation by the existing data mining department. The intent is to conduct as many exploratory searches as possible with the funds allocated. Consequently, a well-conceived idea would not be easily forgotten by the SccoB process. After its expected arrival date had passed,
its search scope would be reduced but the search would be continued using data that was available or inexpensive to obtain.

Over time, a library of maps (problem space, sub-state, and response), moment models, cognitive force assessments, definitions of business process knowledge requirements, and a catalogue of organization knowledge resources would be generated and studied by the mapping operations of the SccoB process. As experience is gained, the mapping operations would become more refined and efficient gaining the firm significant competitive advantage by continuously creating new organization knowledge, providing greater organization agility, and increasing organization congruence.

**SccoB as a strategic management tool**

As a KBS development strategy, the SccoB process uses an explicit aspect of the structuring cause (the explanations of specialists from the video recordings of teleconsultations) to develop knowledge based systems. However, there are other explicit aspects of the structuring cause that can be used to improve organization performance. For example, deep within the structuring cause stir emotions which are difficult to explain and often ignored but organizations can benefit by better understanding and managing these signals. Furthermore, there are other aspects of the structuring cause that might be used by organizations. For example, the management of the action threshold and the control of the illocutionary and elocutionary forces that are generated through the appropriate wording of a message and by the way the message is said (elocution), relate to the structuring cause - the most powerful knowledge type. By recognizing that the explanations and feelings of organization experts, which are artifacts of the structuring cause, are a valuable resource, the organization might benefit from them. An alternate title for this paper: “milking the structuring cause - a valuable knowledge cow” was strongly considered.

According to the knowledge combustion and vehicle analogy, action is controlled by two sets of cognitive processes that precede two emotions (risk and confidence). Based on an assessment of an action’s consequences (risk), the action threshold is established by the structuring cause. Like risk, confidence is an emotion determined deep within the structuring cause, and, just before an action is performed, the action threshold and the actor’s confidence are compared. Only if confidence surpasses the action threshold, will an action be performed voluntarily. Consequently, the deepest, most tacit of Dretske’s three knowledge types - the structuring cause - has the final say concerning risky intelligent actions.

In medicine, the action threshold is managed by ordering the diagnostic tasks so that they move from reliance on readily obtained information to reliance on information that is more costly but more conclusive. However, for riskier actions the role of the structuring cause becomes paramount. For example, upon recognizing a salient pattern of facts (high temperature, continual headache, and aching neck), the problem is framed. Because the risks of the next action are minimal, the action threshold is low, and diagnostic confidence is moved above this low threshold using readily obtained information. Consequently, the next action is performed, and samples are obtained for testing by the lab. The results of the aforementioned lab tests increase the patient’s risk. This is because they indicate that an invasive diagnostic procedure is required. However, the more costly but conclusive lab results have moved the physician’s diagnostic confidence above the higher action threshold, and the invasive diagnostic procedure is conducted. If the results of this procedure indicate a severe blood disease, this finding would raise diagnostic confidence above the elevated action threshold, and its stringent treatment
protocol would be implemented. Initially, the medical diagnostic process is information intense moving from readily obtained information to information that is more costly to obtain but more conclusive. However, for riskier actions the role of the structuring cause increases greatly. For example, if the previous case involved a further complication, such as a serious heart condition, prescribing a treatment strategy would depend greatly on the insights and explanations produced by the structuring cause. The structuring cause becomes paramount, and medical diagnostic practices are designed to effectively manage the action threshold by moving from low level knowledge types to the most powerful knowledge type – the structuring cause.

Previous telemedicine research has indicated that explanations can raise diagnostic confidence (Randles and Thachenkary, 2002). Based on this understanding, the completeness principle was presented by Randles, Miller, and Zhang (2015). This principle proposed that maps are incomplete without explanations, and the HTKB maps would also provide explanations designed to motivate its users to adhere to the prescribed actions. These explanations are viewed as information, and to better manage the action threshold, the diagnostic confidence of less expert diagnosticians would be increased using system provided maps and explanations rather than additional diagnostic tests or the direct involvement of more expert diagnosticians. This should enable less expert diagnosticians to do the appropriate thing and conduct complex diagnoses in a manner similar to the expert diagnostician, improving the organization’s governance of its complex diagnoses.

Being tactful (the next higher mapping level after governance) requires doing the appropriate thing in a delicate situation and requires a competent risk analysis. Consequently, the mapping operations of the SccoB process would be supported by the firm’s risk managers. As SccoB process response maps are developed for anticipated critical events, or existing maps are refined based on the explanation of operational anomalies, each action would be considered, its risk analyzed, and its action threshold established by the firm’s risk managers. In return for the support of the risk managers, the mapping operations of the SccoB process would communicate the aforementioned risk assessments to the appropriate agents, at the appropriate time. Hence, the SccoB process would balance two emotions concerning risk and confidence through its mapping processes by providing explanations to motivate agents to perform prescribed actions as well as providing explanations concerning the risk of the action. Hence the SccoB process moves the firm beyond governance to the tact mapping level with its maps and explanations also serving as a risk management tool.

People do not just utter propositions; they perform illocutionary acts such as stating, requesting, and commanding. Every speech act consists of the illocutionary force F applied to a proposition P, and this is known as the F(P) hypothesis (Covington, 1998). The Bach and Harnish classification system would be used to classify the explanations provided by specialists. This classification system makes many distinctions and is better for enumerating the whole range of human speech (Covington, 1998). Using rules of illocution to classify words, the hypothesis testing knowledge blend would vary the wording of explanations to control their illocutionary force. For example, the illocutionary force of a message could be increased in an urgent situation or decreased in a situation requiring caution.

Our video analysis of diagnostic teleconsultations revealed that during teleconsultations the specialists had to gain the trust of the remote physicians and patients. A deep-voiced neurologist gained the immediate respect of a disoriented elderly patient. The patient became calmer and readily accepted the neurologist’s prescribed treatment, demonstrating the
importance of elocution (how something is said). Using rules of elocution, the HTKB would control voice production in its provision of directions and explanations. Furthermore, information such as agents' assessments regarding their confidence in performing specific business tasks would be collected and analyzed, and this information would be used to refine the firm's task assignments and training programs. This information would also be used to customize the manner of illocution and elocution for specific diagnosticians. Furthermore, providing guidance for complex diagnoses is only the beginning. From supporting complex diagnoses the implementation of the HTKB by the SccoB process would move to supporting the conduct of other complex problem solving processes that are routinely conducted by the firm.

As previously stated, deep within the structuring cause stir emotions that are often ignored, and it is the intent of the SccoB process to gather, depersonalize, aggregate, and report these signals about critical events on a timely basis. This reporting mechanism will adapt techniques that have already been adopted by many organizations. These techniques are based on collecting agent input concerning the relevance of information about a number of topics and will be adapted to generate agent specific guidelines concerning the broadcast of the aforementioned signals to relevant agents of the firm. This information should be easily collected. The SccoB process would develop a query schedule and selected agents of the firm would be queried about how they feel about critical issues by one of their coworkers. Hence, the SccoB process would implement a program entitled – thank you for asking, and by better balancing two emotions concerning risk and confidence, the SccoB process would move the firm to the tact mapping level.

CLOSING REMARKS

By increasing organization congruence, the SccoB process is a strategic management tool, as well a knowledge creation process. The SccoB process is not involved in product or market research. Instead it complements existing business processes. However, this knowledge creation/mapping process will compete for resources with existing planning and administrative functions. Because its operations, except for its mapping operations, are supported by existing organization processes, the SccoB process would start small at only 3% of the planning, management, and administrative services budget. Through its ability to create organization knowledge and to complement existing business processes, its budgetary allocation should increase to 10% of the planning and administrative services budget. Furthermore, by adding value to existing organization planning and administrative functions, the overall budget allocation for these functions should increase over the long term.

Developing the aforementioned tools of knowledge micro analysis and measures of cognitive force are the focus of our future research. We suggest that knowledge management be viewed as a quality management tool, a human resource management tool, a project management tool, and a strategic management tool that fosters organization knowledge creation, learning, and agility as well as improving the allocation of knowledge resources. It is hoped that subsequent research will increase the adoption of knowledge management by knowledge intensive organizations and lead to an expansion of its functions. It is early in the emergence of the science of knowledge management. It is only beginning to transition from an information systems perspective, which is one of its foundation sciences, to a knowledge perspective. There is much work to be done. However, we are excited about the 21st century and the science of knowledge management and hope to silence its death knell.
REFERENCES