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Knowledge management modeling in public sector organizations: a case study

John P. Girard
Minot State University, Minot, North Dakota, USA, and
Susan McIntyre
Centre for Security Science, Defence R&D Canada, Ottawa, Canada

Abstract

Purpose – The purpose of this paper is to describe the successful use of a knowledge management (KM) model in a public sector organization.

Design/methodology/approach – Building on the theoretical foundation of others, this case study demonstrates the value of KM modeling in a science-based initiative in the Canadian public service.

Findings – The Inukshuk KM model, which comprises the five elements of technology, leadership, culture, measurement, and process, provides a holistic approach in public service KM.

Practical implications – The proposed model can be employed by other initiatives to facilitate KM planning and implementation.

Originality/value – This the first project to consider how KM models may be implemented in a Canadian public service environment.

Keywords Knowledge management, Public sector organizations, Modelling, Canada

Paper type Case study

Introduction

The study of knowledge management (KM) is certainly not new. In the past decade, more than 4,000 peer-reviewed journal articles were penned under the subject heading of KM[1]. Of these, more than 100 papers included the term "model" in the title and almost 700 included the term in the abstract. Clearly, a recurring theme is the need for some sort of model to help guide leaders in their quest to develop a knowledge environment. So why is it that leaders feel a need to be guided? Surely, the application of the knowledge in an organization is just a part of doing business. Perhaps, however, more and more executives wishing to fill this void desire the security of a proven model.

Several years ago, a Canadian Federal Department found themselves in such a situation. The most senior leaders recognized the value of KM as evidenced by key words in vision and mission statements; however, they were uncertain how to move from this conceptual notion to a plan of action. The culture of this organization was very structured and as a result they craved a model to guide their transformation to a knowledge-based entity.

The journey for a model commenced with a review of contemporary KM models articulated by O'Dell (1998), Stankosky (in Calabrese, 2000), Bennet and Kanter (2001), and others. Five elements were common in most models: technology, leadership, culture, measurement, and process. Together, these five recapitulate the major themes articulated in the various models (Girard, 2004). Subsequently, a quantitative research

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project of Canadian public service middle managers confirmed the importance of each of the components (Girard, 2005a). A statistical analysis of the five components concluded that leadership was significantly more important than the others. A second interesting finding was that there was no significant difference between technology and culture (Girard, 2005b). The quantitative results were interesting in that they supported the theoretical work of KM thought leaders; however, an important question remained, would these models work in the Canadian public service arena?

Although several validated models existed, including those articulated by O'Dell, Bennet and Stankosky, none of them seemed to fill the void. Initially, the opposition to the various models was attributed to resistance to change. However, further review highlighted a deeper concern – the target audience simply could not associate with the icons of the models. Ironically, it was not the content of the models, but rather, the look and feel of the models that lacked. To solve this identity crisis, a model was developed that built on the successes of the quantitative research, but was in a form that would be palatable to the organizational culture.

The selected icon was the Inuit Inukshuk, a symbol with which most Canadians would associate. The Virtual Museum of Canada describes an Inukshuk as:

> Like a person. An arrangement of stones, often resembling the shape of a human. The inukshuk is used as a navigational aid, as a marker for hunting grounds and caches of food or supplies, in hunting to lure geese and corral caribou, and as a way to mark sacred ground. These stone cairns embody strong spiritual and ancestral connections and have been erected by Inuit on the Arctic tundra for many generations.

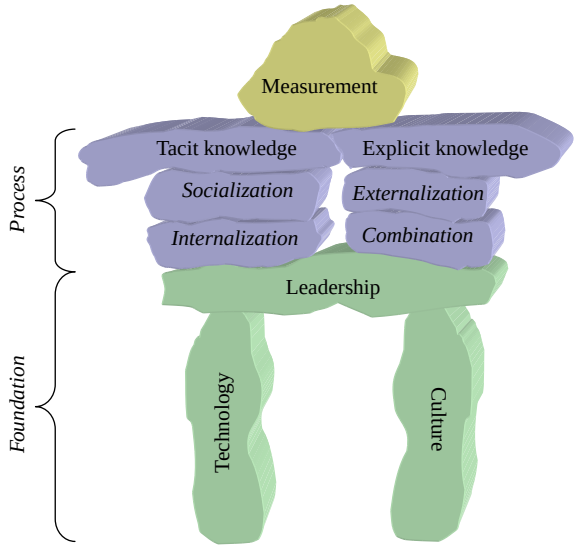
Two extremely important aspects of Inuksuit (plural of Inukshuk) are that each one is unique – much as each KM implementation is different. Equally important is how Inuksuit resemble people as this reinforces the point that KM is about connecting people with people. The model developed for and implemented in the Canadian Department of National Defence is shown in Figure 1.

Very quickly the Inukshuk was accepted as the department's guide toward the knowledge environment. However, the next question to be answered was: does this work in practice or is this just another academic theory that does not work in the real world? To answer this important question, a case study was initiated to examine a knowledge empowered Canadian public sector organization.

Case review

Following the horrific events of September 2001 and the subsequent anthrax attacks in the USA, the Canadian Federal Government recognized the threats to North American security and acted immediately. With the Public Security and Anti-Terrorism budget in December of the same year, it took measures to enhance national security through increased spending in precisely targeted areas. Of particular concern was the capability and capacity to respond to chemical, biological, radiological, or nuclear (CBRN) terrorist attacks. The federal science and technology (S&T) community responded by joining together to propose a novel cross-sector model that would address this issue.

Recognizing the need for a fresh approach to S&T management, one that would break down traditional stovepipes and transcend boundaries, senior science, and national security leaders launched the CBRN Research and Technology Initiative (CRTI) in May 2002. Its mission was to strengthen Canada's preparedness, prevention and response to CBRN terrorist attacks through investments in S&T. This would be



Source: Girard (2005)

Figure 1.
The Inukshuk, a Canadian model for KM

accomplished through a framework based upon principles and components inherent to KM, as well as science management. The CRTI framework embodies the five KM enablers of the Inukshuk model as shown in Figure 1. Each enabler will be described briefly below to illustrate the elements of the model.

Culture

As a brand new initiative, CRTI had some latitude to develop a culture that would encourage knowledge sharing and creation. The framework was designed to facilitate the creation of communities comprised of members from various, previously unrelated entities. With membership that grew to include 19 federal government departments and agencies, the governance structure required the active involvement of a diverse group of senior S&T managers as members of the Steering Committee; as research and development project champions; and as leaders for new visions of CBRN S&T in Canada. Additionally, four laboratory clusters (chemical, biological, radiological/nuclear, and forensics) pulled together members from over 40 government labs and operational communities to work together in community to enhance Canadian scientific capacity in their respective domains.

The CRTI main thrust has been a competitive research and technology development process in which S&T projects must have cross-disciplinary and cross-organizational collaboration, bringing together non-traditional partners from all national S&T sectors for common purposes. Projects are selected for funding when they can demonstrate relevance, innovative solutions and partnerships during the application process. CRTI provides 66 percent of the funding with the remaining coming from the project teams in direct investments or in-kind contributions. Some project categories require non-traditional partners from first responder or industrial sectors. Others require at least

two federal science-based departments or agencies to work together, often a rarity in the past.

Technology

Technology is a particularly important piece of the puzzle when a community is dispersed across a vast geographical area such as Canada. CRTI, through a needs assessment by members of the laboratory clusters, identified the requirement for a technological knowledge portal to collect, share, and create new information related to their work in CBRN. In addition to the "InfoPort," there has been initiative from the clusters to develop a Laboratory Information Management System to collect and exchange data during CBRN events. The need for secure and assured processing between multiple, dispersed partners has led to studies for information security solutions.

Technology is a particularly important tool for communication among the participants of the CRTI as well as with the many and varied stakeholder groups, up to and including the Canadian public. Since programmatic information must be accessible to partners across the country, many of whom never meet in person, technological solutions for the sharing and transmitting of this data is very important. On the scientific information side, a technological platform to exchange validated, quality knowledge has been valuable for scientific staff but also for colleagues in the first responder community.

Leadership

The CRTI framework established the important role of leadership by initially recognizing that the expertise for CBRN S&T resided within the federal government science community and then, assigning senior influential scientists to key positions within the laboratory clusters and as project champions. Within the framework, however, there has been plenty of room for emergent leaders, those individuals who recognize the importance and opportunities in the CRTI mission and take it upon themselves to assume leadership roles. A horizontal initiative has many occasions for these emergent leaders to play a pivotal role in advancing the CRTI goals and vision.

If, as Bennis (1999) has written, there are truly four primary attributes of a successful leader, these have been demonstrated by the leaders of the CRTI since its inception:

(1) The early conceptual leaders provided a sense of purpose to those they led, instilling the importance of CBRN S&T preparedness to the safety and well-being of the Canadian public.

(2) Within the laboratory clusters specifically, and the CRTI generally, the cluster leaders and other senior scientists have planned exercises and other events that have permitted the membership to get to know one another, thereby generating and sustaining trust.

(3) Fostering hope and optimism has been an underlying current in the initiative, encouraging participants to work toward excellence in S&T and often is the contribution of informal leaders.

(4) Above all, the leadership has been results-oriented; from the initial insistency that the focus be on technology for the end-users to the project management approach, the CRTI is focused on results.

Process

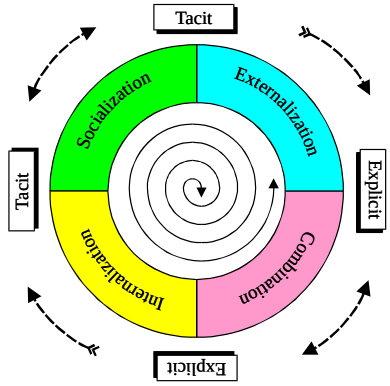
The process of knowledge generation in CRTI is extremely dynamic and best described using the SECI model of Nonaka and Takeuchi (1995), within the context of socialization, externalization, combination, and internalization as shown in Figure 2.

The tacit-to-tacit knowledge conversion or socialization process has been best observed in the laboratory clusters during their first year of existence when they met in face-to-face environments, in meetings, workshops, and symposia. As a means of defining their capabilities and preparedness levels, they have undertaken both tabletop and live exercises to work together on collective responses to possible CBRN terrorist events. For example, in an exercise labelled "Follow on," the radiological/nuclear cluster brought teams from six different organizations together in February 2005. This was an opportunity to build trust, credibility, and reliability through the knowledge process of socialization. This exercise, the second in a series of four increasingly complex events demonstrated significant advancements in the cluster's shared experience and cohesiveness since the first exercise in October 2003.

During externalization, the tacit to explicit knowledge conversion, S&T projects and clusters are bringing their collective scientific knowledge into new technology products and paradigms. One way in which this has occurred is through capturing both the results of discussions and problem-solving workshops into documents for the use of community members. Similarly, it has occurred by capturing "lessons learned" from exercises in a very intentional way. As standard practice, after exercises are completed, all participants meet for a after action review in which a rapporteur captures the proceedings. The discussions and events receive additional analysis and are turned into action plans for the future.

In the process of combination, the explicit knowledge or information, is converted through analysis or repackaging into another version of explicit conversion. For CRTI, this has started to occur by formalizing standards and protocols, streaming CBRN information into various communications formats for various stakeholders, and building the knowledge database. For example, lessons learned from exercises and workshops are reformulated into protocols for future exercises or events.

Internalization is the knowledge process where explicit knowledge becomes internalized through actually performing tasks or assimilating the knowledge. As an



Source: Adapted from nonaka and takeuchi (1995)

Figure 2.
Process based on the SECI model

example, specialized laboratory training on how to identify CBRN agents is provided annually by cluster experts to their colleagues who previously have not had this training. In other cases, cluster members have internalized new skills by employing them in other non-CBRN disaster responses. For the participants of exercise follow on, they had an opportunity in March 2006 to in exercise maritime response to apply what they had learned through the first two exercises, the lessons learned and the creation of new protocols.

Measurement

Measurement is the final enabler in the Inukshuk model. It is the one element that will allow stakeholders to determine if KM activities have contributed to the strategic goals of the organization. As a Canadian Federal Government initiative, CRTI is accountable for the results it produces. Within a results-based management and accountability framework, outputs and immediate, intermediate, and final outcomes have been identified. Within this framework, measures have been identified for KM, linking specifically desired outcomes with KM activities. Measurement of the various enablers in the Inukshuk has taken different forms.

Research undertaken for CRTI by McGill University (Dalkir *et al.*, 2007) in 2006 reviewed KM initiatives to determine the impact on CRTI outcomes. The survey results and analysis indicated that activities aimed at facilitating collaboration and knowledge sharing were highly successful in increasing both cooperation and learning. Technology initiatives were less successful and required adjustments for improved communications. Additional research on leadership (MacGillivray, 2006) has shown that within a complex environment such as that found within the CRTI, successful leaders must possess a different set of attributes than those found in traditional hierarchical structures most often associated with public service structures. On-going social network analysis should also provide insights into the efficacy of the KM model.

Conclusion

KM will be one way that leaders of the future may conquer the many challenges confronting their organizations. However, to ensure the best return on their knowledge investment one must understand and apply the enablers of KM. The Inukshuk knowledge model, which includes the enablers of technology, leadership, culture, process, and measurement, may go some way in ensuring organizations derive maximum benefit.

A case review of a knowledge empowered organization indicated that it is on target for achieving its intended outcomes, although evaluations of the impact of KM have yet to be ascertained. Observations do indicate, however, that the five knowledge enablers have contributed in positive ways to the ability of the organization to accomplish its mandate. By comparing this knowledge initiative with the Inukshuk model, it can be determined that a viable knowledge program contains the five enablers. There were no evident exceptions, imbalances or voids during the application of the model. The results of a quantitative research project corroborate these findings, suggesting the Inukshuk model captures the essence of knowledge enablers.

Note

1. Based on search Academic Search Premier; Business Source Premier for DE "knowledge management" and scholarly (peer reviewed) journals; published 1995-2005.

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Corresponding author

John P. Girard can be contacted at: john@johngirard.net