

## Archived Content

Information identified as archived on the Web is for reference, research or record-keeping purposes. It has not been altered or updated after the date of archiving. Web pages that are archived on the Web are not subject to the Government of Canada Web Standards.

As per the [Communications Policy of the Government of Canada](#), you can request alternate formats on the "[Contact Us](#)" page.

## Information archivée dans le Web

Information archivée dans le Web à des fins de consultation, de recherche ou de tenue de documents. Cette dernière n'a aucunement été modifiée ni mise à jour depuis sa date de mise en archive. Les pages archivées dans le Web ne sont pas assujetties aux normes qui s'appliquent aux sites Web du gouvernement du Canada.

Conformément à la [Politique de communication du gouvernement du Canada](#), vous pouvez demander de recevoir cette information dans tout autre format de rechange à la page « [Contactez-nous](#) ».

CANADIAN FORCES COLLEGE / COLLÈGE DES FORCES  
CANADIENNES  
CSC 31 / CCEM 31

EXERCISE NEW HORIZONS

DEVELOPING A DND/CF KNOWLEDGE MANAGEMENT STRATEGY  
BY LEARNING FROM THE PUBLIC AND PRIVATE SECTOR

By /par Lieutenant Colonel J.A. Bates  
Syndicate 6/Groupe d'études 6  
29 April 2005

*This paper was written by a student attending the Canadian Forces College in fulfilment of one of the requirements of the Course of Studies. The paper is a scholastic document, and thus contains facts and opinions, which the author alone considered appropriate and correct for the subject. It does not necessarily reflect the policy or the opinion of any agency, including the Government of Canada and the Canadian Department of National Defence. This paper may not be released, quoted or copied except with the express permission of the Canadian Department of National Defence.*

*La présente étude a été rédigée par un stagiaire du Collège des Forces canadiennes pour satisfaire à l'une des exigences du cours. L'étude est un document qui se rapporte au cours et contient donc des faits et des opinions que seul l'auteur considère appropriés et convenables au sujet. Elle ne reflète pas nécessairement la politique ou l'opinion d'un organisme quelconque, y compris le gouvernement du Canada et le ministère de la Défense nationale du Canada. Il est défendu de diffuser, de citer ou de reproduire cette étude sans la permission expresse du ministère de la Défense nationale.*

## ABSTRACT

This paper argues that the Department of National Defence and the Canadian Forces (DND/CF) must develop a knowledge management (KM) strategy that builds on the KM strategy at Defence Research and Development Canada (DRDC) and benefits from the lessons learned within the private sector. KM is a relatively new business discipline that promotes knowledge sharing within an organization in order to improve performance that leads to competitive advantage. The argument finds its basis in the Defence Strategy 2020 vision statement that states the CF aims to be recognized as a “relevant knowledge-based institution” consisting of multi-skilled people who are focused upon knowledge management and innovation among other things. The private sector clearly recognizes that KM is vital to their business success and so this paper examines three leading knowledge-based companies from whom we can learn a great deal on KM. DRDC is a public sector leader in the development of a KM strategy and this paper takes a close look at their strategy. The paper concludes that the lessons learned on KM in the private sector are reflected within DRDC’s comprehensive KM strategy and as such it provides us a very good model to follow. In order to achieve the vision of being recognized as a relevant knowledge-based institution, DND/CF must first develop a KM strategy.

*“Much that once was is lost, for none now live that remember it.”*

*The Lord of the Rings*

The May 2004 issue of HRMagazine reported that ‘Fortune 500 companies lose at least \$31.5 billion a year by failing to share knowledge, according to International Data Corp.’<sup>1</sup> Human nature is the reason that knowledge is not shared because of lack of trust in the workplace, fear that ideas will be ridiculed, and simply being too busy to take on additional work and responsibility.<sup>2</sup> We will see that to create an environment that promotes knowledge sharing requires leadership that influences people and culture to view knowledge as an asset to be shared in order to gain value that leads to competitive advantage.

The sharing of knowledge in order to improve performance is the aim of the discipline called knowledge management (KM). Managing knowledge is about “managing intellectual capital” and “capturing value from knowledge”<sup>3</sup> that will be put into action to gain an advantage. “KM increases the efficiency of knowledge diffusion within organizations”<sup>4</sup> with the aim of applying that knowledge to improve performance.

---

<sup>1</sup> Pamela Babcock, “Shedding Light on Knowledge Management,” *HRMagazine*, May 2004, 46.

<sup>2</sup> Pamela Babcock, “Shedding Light on Knowledge Management,” ..., 47.

<sup>3</sup> Mie Augier and Thorbjorn Knudsen, “The architecture and design of the knowledge organization.” *Journal of Knowledge Management*. 8, no. 4 (2004): 6.

<sup>4</sup> Jean Egmon, Jean, Jim Lee, Darcy Lemons, and Wesley Vestal, American Productivity and Quality Centre (APQC), “Integrating Knowledge Management and Organizational Learning: Final Report 2004,” <http://www.apqc.org/portal/apqc/site?path=root>; Internet; accessed 25 November 2004.

Simply put, “the essence of KM is to provide strategies to get the right knowledge to the right people at the right time and in the right format.”<sup>5</sup>

The Department of National Defence and the Canadian Forces (DND/CF) are charting a course through the murky waters of KM although the waters are not entirely uncharted. Even without a KM strategy we have been doing this thing called KM for a long time as a routine part of our operations, albeit in a disjointed manner. For many years private sector companies have been investing in KM initiatives<sup>6</sup> and therefore DND/CF can learn valuable lessons from these companies. Their main lesson is that we can improve performance and gain advantage over competitors by instilling a KM discipline to create a culture whereby it is human nature to share knowledge.

Knowledge management within the Canadian defence environment was the topic of a paper written by Barbara Waruszynski of Defence Research and Development Canada (DRDC). She put forward several key findings that are pertinent to our discussion. They are as follows:

First, DND/CF should be moving towards a KM strategy. Second, the key enablers for fostering a KM environment within DND/CF are leadership and information management /information technology. Third, the KM strategy should incorporate both the corporate and operational environments. Fourth, working within internal and external communities is essential for communicating and networking on emerging issues in defence. Fifth, tools and technologies should be developed to promote collaboration, greater communication

---

<sup>5</sup> Kostas Ergazakis, Kostas Metaxiotis and John Psarras. “Toward knowledge cities: conceptual analysis and success stories.” *Journal of Knowledge Management*. 8, no. 5 (2004): 5.

<sup>6</sup> Jean Egmon, Jean, Jim Lee, Darcy Lemons, and Wesley Vestal, American Productivity and Quality Centre (APQC), “Integrating Knowledge Management and Organizational Learning: Final Report 2004,” <http://www.apqc.org/portal/apqc/site?path=root>; Internet; accessed 25 November 2004.

and access to information. Finally, the investment in people within organizations is the most important component of knowledge leveraging.<sup>7</sup>

Waruszynski's findings led to the development of a comprehensive KM strategy at DRDC that is consistent with Defence Strategy 2020. According to the Strategy 2020 vision statement the CF aims to be recognized as a "relevant knowledge-based institution" consisting of multi-skilled people who are focused upon knowledge management and innovation among other things.<sup>8</sup> To achieve that broad aim DND/CF must develop a knowledge management strategy that builds on the strategy and lessons learned at DRDC and within the private sector.

We will begin our discussion by understanding the nature of KM and determine why it is important to DND/CF. There are many excellent examples of KM in action already within DND/CF and we will look at some. Next we will explore some KM processes, measures for success and then look at the comprehensive KM strategy that is in place at DRDC. We will see that DRDC's KM strategy is a very good model for DND/CF to follow. There are many large companies that employ KM successfully and we will look at three: The World Bank, NASA and the Jet Propulsion Laboratory, and finally 3M. From there we will compile their lessons learned and see that they are generally reflected within DRDC's strategy, which reinforces the argument that DRDC's KM strategy is a very good model for DND/CF.

---

<sup>7</sup> Barbara Waruszynski, *Knowledge Management within the Canadian Defence Environment*. Defence Research and Development Canada: file DRDC TM 2001-008, December 2001.

<sup>8</sup> Department of National Defence. "Shaping the Future of the Canadian Forces: A Strategy for 2020," [http://www.cds.forces.gc.ca/pubs/strategy2k/intro\\_e.asp](http://www.cds.forces.gc.ca/pubs/strategy2k/intro_e.asp); Internet; accessed 24 February 2005.

What is KM and why is it important to DND/CF? In defining KM, Waruszynski of DRDC presents a very practical definition: “A conscious strategy of getting the right knowledge to the right people at the right time; and helping people share and put information into action in ways that strive to improve organizational performance.”<sup>9</sup> KM is about capturing and sharing with others our lessons, stories, experiences and expertise that we hold in our minds that is of value to others. In analyzing the definition of KM it is useful to distinguish between knowledge and information. In a recent issue of the Canadian Military Journal, Lieutenant-Colonel John Girard presents a comprehensive look at KM, making reference to a cognitive theory that shows the creation of knowledge supported by information and beneath that, information supported by data.<sup>10</sup> Knowledge is “information and skills gained through experience or education”<sup>11</sup> that can be categorized as tacit or explicit knowledge. Tacit knowledge is about that which is generally understood without having to be stated and explicit knowledge is clear and detailed knowledge that can be codified.

The importance of knowledge itself is evident in the words of some great minds. The ancient philosopher Sun Tzu tells us: “Know the enemy and know yourself; in a

---

<sup>9</sup> Barbara Waruszynski, *Knowledge Management within the Canadian Defence Environment*. Defence Research and Development Canada: file DRDC TM 2001-008, December 2001.

<sup>10</sup> LCol John Girard, “Defence Knowledge Management: A Passing Fad?,” *Canadian Military Journal* 5, no. 2 (Summer 2004): 18.

<sup>11</sup> Catherine Soanes, Ed., *The Pocket Oxford English Dictionary, Ninth Edition* (Oxford: Oxford University Press, 2002), 502.

hundred battles you will never be in peril.”<sup>12</sup> Peter Drucker, referred to as the “Father of Modern Management” states; “The basic economic resource – the means of production – is no longer capital, nor natural resources, nor labour. It is and will be knowledge.”<sup>13</sup> It makes sense then that such a vital commodity must be shared to improve performance of the greatest number and ultimately the organization itself.

An important reason to manage knowledge has to do with turnover of personnel. Attrition is a natural part of any organization, however there is increased management awareness that as workers leave valuable knowledge is going with them, which is a loss unless measures have been taken to preserve that knowledge. “Knowledge needs to be captured, interpreted, and eventually transferred in such a manner that the knowledge will continue to serve the organization.”<sup>14</sup>

To achieve the Defence Strategy 2020 vision, of being recognized as a knowledge-based institution, it is necessary to create a culture whereby it is human nature to share knowledge so that we avoid learning lessons in isolation that result in organizational inefficiency. The following quote captures the essence of why knowledge management is important to any organization including DND/CF:

‘Smart’ organizations are those that design processes, practices, tools, and incentives that continuously enrich the work environment and work practice itself with more and more timely and relevant information and knowledge. However, these environments are only

---

<sup>12</sup> Sun Tzu, *The Art of War*, trans. Samuel B. Griffith (Oxford: Clarendon Press, 1963), 84.

<sup>13</sup> Peter F Drucker, *A Post-Capitalist Society* (New York: HarperCollins, 1993), 19.

<sup>14</sup> Alan D. Smith, “Knowledge management strategies: a multi-case study,” *Journal of Knowledge Management* 8, no. 3 (2004): 6.



as good as the users within them who create, share, store, use, and re-use the knowledge, in the midst of real practice, to continuously improve their capability and their contributions to the organization's value chain. Therefore, smart organizations are those that help people use their environments to become smarter and better at what they do.<sup>15</sup>

Looking at the KM landscape within DND/CF we find many examples of KM in action. The military Mess, a long-standing institution that exists to foster esprit de corps and comradeship is the setting for knowledge sharing through story telling. This is KM in action. The Air Force's flight safety program has instilled a culture of trust and openness amongst air force personnel by rewarding them for coming forward to share both positive and negative experiences with the aim of creating a safe operating environment and preventing accidents. The Army has established a Lessons Learned Centre with a portal for easy user access in order to organize its vast amount of knowledge and to facilitate sharing. It is standard procedure to complete post exercise reports and after-action reports upon termination of an exercise in order to collect the lessons learned with the aim of improving operational performance. These lessons learned are used to improve the many operational plans that exist across the CF, which is an example of codified knowledge. Examples of KM in the Navy include port reports that are updated after each port visit and a classified gateway portal called the Maritime Command Operations Information Network (MCOIN) that offers users access to extensive resources.

---

<sup>15</sup> Jean Egmon, Jean, Jim Lee, Darcy Lemons, and Wesley Vestal, American Productivity and Quality Centre (APQC), "Integrating Knowledge Management and Organizational Learning: Final Report 2004," <http://www.apqc.org/portal/apqc/site?path=root>; Internet; accessed 25 November 2004.

KM in action is evident at the warfare centres that are responsible to develop and disseminate doctrine, among other things. “Doctrine is an accumulation of knowledge gained primarily from the study and analysis of experience, which may include actual combat or contingency operations as well as equipment tests or exercises.”<sup>16</sup> Another excellent example of KM in action is within the world of Joint Operations. The Canadian Forces Experimentation Centre (CFEC) collaborates with many different defence communities including the C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance) community and the scientific community at DRDC to explore emerging concepts and capabilities that support transformation.<sup>17</sup> These operational communities of practice<sup>18</sup> enable the capturing and sharing of knowledge within the CF.

Within the corporate side of DND there are many examples of active KM. There are many communities of practice coming together to shape the future of DND/CF. For example the MOSART (Military Occupational Structure Analysis, Redesign and Tailoring) community is shaping the future of all CF occupations. The MA&S (Material

---

<sup>16</sup> United States, United States Air Forces, *Air Force Basic Doctrine* (Washington, D.C.: U.S. Government Printing Office, November 17, 2003), 3.

<sup>17</sup> Department of National Defence, “Canadian Forces Experimentation Centre Mission Statement,” [http://www.ops.forces.gc.ca/units/cfec/default\\_e.asp](http://www.ops.forces.gc.ca/units/cfec/default_e.asp); Internet; accessed 24 February 2005.

<sup>18</sup> Training and Development Community Centre, <http://www.tcm.com/trdev/cops.htm>; Internet; accessed 10 April 2005. “Communities of Practice - What are CoPs? At the simplest level, they are a small group of people who have worked together over a period of time. Not a team, not a task force, probably not even an authorized or identified group. People in CoPs can perform the same job (tech reps) or collaborate on a shared task (software developers) or work together on a product (engineers, marketers, and manufacturing specialists). They are peers in the execution of "real work." What holds them together is a common sense of purpose and a real need to know what each other knows. There are many communities of practice within a single company, and most people belong to more than one of them.”

Acquisition & Support) community is changing the way we procure equipment and support the CF through the development of MASIS (Materiel Acquisition and Support Information System). MASIS evolved through the benefits driven procurement strategy that “incorporated the lessons learned and best management processes from past IT projects within both industry and the public sector.”<sup>19</sup> To promote individual and organizational learning, the Distant Learning Network is making training available online to DND/CF personnel. These are all superb examples of KM in action.

As can be seen, there exists a patchwork of successful KM examples throughout DND/CF. The common thread is the emphasis on sharing knowledge by bringing people together as Waruszynski points out, investment in our people is the most important component of knowledge leveraging.

What are some KM processes and measures for success? Alan D. Smith, professor at Robert Morris University in Pittsburgh USA, in his article “Knowledge management strategies: a multi-case study,” recommends an approach to KM strategy development based on the KM practices of three organizations that he researched. In developing a strategy, he recommends that upper management capitalize on “human skills, expertise and relationships,” which he states are “the most valuable resources

---

<sup>19</sup> Department of National Defence, “Benefits Driven Procurement,” [http://www.forces.gc.ca/admmat/masis/bdp\\_e.asp](http://www.forces.gc.ca/admmat/masis/bdp_e.asp); Internet; accessed 24 February 2005.

available to any organization”.<sup>20</sup> Smith’s recommendation strikes a familiar chord with the military way of thinking in recognizing the value of people.

Smith suggests that there are two strategies for managing knowledge: the “codification strategy” and the “personalization strategy,”<sup>21</sup> and he emphasizes the point that “a company’s KM strategy should reflect its competitive strategy.”<sup>22</sup> The CF has no competitive strategy per se, so the defence strategy serves as the reference point for DND/CF KM strategy development. According to Strategy 2020, the Canadian defence strategy “is to position the force structure of the CF to provide Canada with modern, task-tailored, and globally deployable combat-capable forces that can respond quickly to crises at home and abroad, in joint or combined operations.”<sup>23</sup> In short, CF personnel rely on explicit and tacit knowledge to solve problems related to the defence of Canada and its interests abroad. Regarding explicit knowledge, Smith suggests using a codified approach and for tacit knowledge, he suggests using a personalized approach.<sup>24</sup> In all instances, leadership is essential to determine the appropriate strategy.

---

<sup>20</sup> Alan D. Smith, “Knowledge management strategies: a multi-case study,” *Journal of Knowledge Management* 8, no. 3 (2004): 6.

<sup>21</sup> Alan D. Smith, “Knowledge management strategies: a multi-case study”, ..., 7. Codification strategy is where knowledge is carefully codified and stored in databases, where it can be accessed and used easily by anyone in the company. Personalization strategy is where knowledge is closely tied to the person who developed it and is shared mainly through direct person-to-person contacts.

<sup>22</sup> *Ibid.*, 7.

<sup>23</sup> Department of National Defence. “Shaping the Future of the Canadian Forces: A Strategy for 2020,” [http://www.cds.forces.gc.ca/pubs/strategy2k/intro\\_e.asp](http://www.cds.forces.gc.ca/pubs/strategy2k/intro_e.asp); Internet; accessed 24 February 2005.

<sup>24</sup> Alan D. Smith, “Knowledge management strategies: a multi-case study”, ..., 7.

Smith's research revealed three major themes when it comes to KM strategy development. First is to "create and nurture a knowledge-sharing culture, [create] human processes that are centred around knowledge and the ability to learn from others, and [develop] a sense of business ethics that (sic) allow for guiding principles by upper management for the interaction of people, processes, technology and content activities."<sup>25</sup> He stresses that upper management creates the conditions for success of a KM strategy.

An organization that has done an excellent job of developing and explaining its KM strategy is DRDC. Their KM strategy supports its vision of "becoming the best in defence R&D."<sup>26</sup> Similar to Smith's observations from his own research, DRDC's approach to KM is based on the idea that "knowledge is the domain of people and resides in the communities and social relationships of these people."<sup>27</sup> Some key principles of their KM strategy include empowering employees with the information and knowledge they need to facilitate innovation, to foster connections amongst people, and to create the conditions to permit the organization's experts within various fields to be available to other employees in order to facilitate and enhance knowledge sharing.<sup>28</sup>

DRDC's strategic KM objectives focus on creating an organizational culture that rewards employees for innovative approaches toward knowledge sharing and also enables

---

<sup>25</sup> Alan D. Smith, "Knowledge management strategies: a multi-case study", ..., 9.

<sup>26</sup> Department of National Defence, *Defence Research and Development Canada: Knowledge Management Strategy and Framework*, (Ottawa: DRDC TN 2003-002, 22 April 2003), ii/iii.

<sup>27</sup> Department of National Defence, *Defence Research and Development Canada: Knowledge Management Strategy and Framework*, ..., 9.

<sup>28</sup> *Ibid.*, 9.

them with the information management (IM) tools they need to do the job.<sup>29</sup> The framework for the DRDC KM strategy has four components that are described as follows:

1) establishing and nurturing a workplace environment that is conducive to knowledge sharing and creation, i.e., the ‘knowledge environment’; 2) tools and systems to access and share information and knowledge; 3) establishing and nurturing relationships for the creation and exchange of knowledge; and 4) the ability to develop the skills and expertise of employees through learning strategies.<sup>30</sup>

The KM strategy includes a comprehensive action plan and of particular note, it also includes the critical success factors. In terms of measuring progress, these success factors are vital and it is worthwhile listing them directly from the DRDC document.

They are as follows:

Willingness and time of managers and employees to participate;  
 Dedicated staff for content maintenance and KM guidance;  
 Effective communications strategy;  
 Senior management support;  
 Available funding sources;  
 Integration with internal Information Technology (IT) standards and the Information Management (IM) model;  
 Creation of cross-boundary teams on KM initiatives;  
 Acceptance and encouragement of grassroots KM development;  
 Acceptance of current cultural norms; and  
 Adequate and appropriate training for users.<sup>31</sup>

The DRDC KM strategy conforms to Smith’s three major strategy themes referenced earlier (culture, human process, and business ethics). The KM strategy focuses

---

<sup>29</sup> Ibid., 10.

<sup>30</sup> Ibid., ii/iii.

<sup>31</sup> Ibid., 14.

on developing communities of knowledge centred on social relationships that fit the people-centric approach of the defence strategy vision statement. For these reasons the DRDC KM strategy offers a very good starting point for the DND/CF KM strategy. The next step is to see what we can learn from the private sector.

Having looked at the KM processes and strategy in place at DRDC, it is helpful to look at some practical examples of KM in action within the private sector with the aim of learning from their experience in order to enhance the DND/CF KM strategy. APQC (American Productivity and Quality Centre) is an excellent source of information on this topic. APQC is a think tank that includes leaders from Fortune 1000 companies, union leaders, and former senior government officials whose mission it is to promote increased productivity in organizations worldwide. “APQC works with its member organizations to identify best practices, discover effective methods of improvement, and broadly disseminate findings.”<sup>32</sup> APQC has profiled many private companies that have advanced in the area of KM and this author has selected three that stand out as leaders in the field including: The World Bank, NASA and the Jet Propulsion Laboratory, and 3M. These are very large and complex organizations with operations worldwide and in many ways are similar to DND/CF. As such their successes and lessons learned are of interest to us.

With a workforce of approximately 9,300 spread across 160 countries, “the World Bank is the [worlds] largest provider of development assistance and commits about \$20

---

<sup>32</sup> American Productivity and Quality Centre (APQC), “About APQC,” [http://www.apqc.org/portal/apqc/site/generic?path=/site/about\\_apqc/about\\_apqc.jhtml](http://www.apqc.org/portal/apqc/site/generic?path=/site/about_apqc/about_apqc.jhtml); Internet; accessed 25 February 2005.

billion in new loans each year to help developing countries follow a path of stable, sustainable, and equitable growth.”<sup>33</sup> The World Bank’s mission is to “fight poverty and improve the living standards of people in the developing world. It is a development Bank which provides loans, policy advice, technical assistance and knowledge sharing services to low and middle income countries to reduce poverty.”<sup>34</sup>

The sharing of knowledge is vital to the success of the World Bank’s major initiatives that include “helping people make decisions that impact the economy, strengthening government, protecting the environment, and supporting private business development.”<sup>35</sup> Some of their KM activities include mentoring and coaching programs, orientation, debriefings, thematic groups, and advisory services. The World Bank has also established a learning network and development gateway that support the sharing of knowledge with clients to enhance their capacity. They have found that KM has stimulated innovation based on two developments: upper management support which led to greater resources for KM efforts, and “the absence of an organizational blueprint or strategy on how to implement KM” has contributed to “a more open and flexible environment of experimentation, original thinking and innovative ideas.”<sup>36</sup> This author

---

<sup>33</sup> American Productivity and Quality Centre (APQC), “The World Bank: Using KM to Drive Innovation 2003,” <http://www.apqc.org/portal/apqc/site?path=root>; Internet; accessed 25 November 2004, 168.

<sup>34</sup> The World Bank, <http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/0,,pagePK:50004410~piPK:36602~theSitePK:29708,00.html>; Internet; accessed 24 February 2005.

<sup>35</sup> American Productivity and Quality Centre (APQC), “The World Bank: Using KM to Drive Innovation 2003,” ..., 168.



would argue that this bottom-up approach to KM is a strategy in itself, an open and flexible KM strategy.

It is interesting that the organizational barriers to knowledge sharing and innovation at the World Bank appear similar to those at DND/CF. They include its large size and bureaucratic nature, engaging and maintaining participation in the communities, inflexible mindset of many staff, downsizing pressure, and low trust levels among middle management.<sup>37</sup> The World Bank uses the following actions to address these barriers:

- Articulate and disseminate a clear knowledge strategy.
- Get organized for knowledge management.
- Provide support to communities of practice.
- Provide resources for knowledge-sharing activities.
- Change the personnel evaluation system.
- Provide suitable technology.
- Establish metrics to track what is happening.<sup>38</sup>

Taking a closer look at some KM practices at The World Bank, we begin with the development gateway. The gateway is a portal that “offers users access to development information, resources, and tools and provides a space to contribute knowledge and share experiences.”<sup>39</sup> The gateway empowers virtual communities of learning and discussion groups to address key development issues guided by advisors and experts on particular topics. Registered users can receive e-mail alerts to let them know about new content available on a specific topic of interest.

---

<sup>36</sup> Ibid., 170.

<sup>37</sup> Ibid., 170.

<sup>38</sup> Ibid., 170.

<sup>39</sup> Ibid., 171.

Similar to the development gateway is the development forum. The forum is a virtual discussion group dealing with key issues and challenges facing the development community with emphasis on learning from the experience of those who face the challenges daily. Other features, including a “speaker’s corner,” that provoke discussion and debate on development issues, complement these dialogues.<sup>40</sup> The forum organizers work to mobilize active participation in the dialogues that include diverse groups such as research institutions, think tanks, universities, NGOs, and other stakeholders.

Thematic groups also called “communities of practice, are groups of people who are passionate about a common subject.”<sup>41</sup> Membership in any group is voluntary and open to all staff and external partners. These groups collect knowledge such as best practices and statistical information, they outreach to partners in the field providing support and assistance to projects, and they raise funds for specific programs. These groups provide some of the greatest innovations because of their fervour for the issue at hand and their close interaction with the partners and individuals who are dealing directly with developmental issues.<sup>42</sup>

“The World Bank uses formal and informal incentives to foster and support knowledge sharing within its organization.”<sup>43</sup> One incentive is the “President’s Award

---

<sup>40</sup> Ibid., 172.

<sup>41</sup> Ibid., 173.

<sup>42</sup> Ibid., 173.

for Excellence” program for teams who have excelled in knowledge sharing. Annual performance reviews include knowledge sharing and learning as assessment factors. “The organization has learned the importance of embedding the organizational culture with the idea that knowledge and innovation is a competency and a highly desired activity.”<sup>44</sup>

To mention a few other KM activities, there are knowledge fairs, “which are learning events to communicate about and encourage the spreading of knowledge.”<sup>45</sup> It involves a worldwide competition to develop new ways to fight poverty. In 2002 there were 2,400 entries with 204 finalists, and more than 40 of the suggested programs were funded. There is the knowledge intern program that supports graduate studies in KM amongst bank employees. And finally success stories are important. “Story telling has long been a vehicle for conveying success in the World Bank, to the extent that it is firmly embedded in its culture.”<sup>46</sup>

Leadership is an important aspect of knowledge sharing and is worth mentioning here. Knowledge sharing at the World Bank is decentralized and does not have a central pool of resources. It is a matrix structure with regions and networks that hold the resources and each vice president office has a person to coordinate KM resources. Each region has a knowledge coordinator and advisory services such as a help desk or call

---

<sup>43</sup> Ibid., 173.

<sup>44</sup> Ibid., 174.

<sup>45</sup> Ibid., 174.

<sup>46</sup> Ibid., 174.

desk. “Thematic group leaders or heads of communities of practice spend about 10 to 25 percent of their time on knowledge sharing functions.”<sup>47</sup> Of particular note is that one of the most supportive champions of KM at the World Bank is its president who clearly articulated his vision for a knowledge bank in 1996.<sup>48</sup> This author believes that this one factor more than anything else has contributed to the success of knowledge sharing at the World Bank.

The World Bank presents seven main lessons learned regarding knowledge sharing and it is beneficial to directly quote them because the lessons give us the essence of what a KM strategy should be all about.

Leadership – It is essential to have a top executive as a sponsor for knowledge sharing activities and programs.

Organization – Communities are the heart and soul of knowledge sharing at the World Bank.

Culture – It is important to combine formal and informal incentives for knowledge sharing.

Measurement – It is important to demonstrate the value of knowledge sharing to the front lines to ensure the continued participation in and success of those activities and programs.

Communication – It should be relentless and inspiring and stimulate awareness and learning.

embraced knowledge sharing as a way to preserve its “innovative spirit” and KM has become a cornerstone of NASA-JPL’s success as it is now embedded in its culture.<sup>50</sup> “Though [KM] started as a grassroots movement, its success has gained the attention of top management.”<sup>51</sup> KM became critical for two reasons: to effectively manage risk and to deal with an aging workforce that represented a significant amount of corporate knowledge.<sup>52</sup> Management realized that there was an urgent need to capture and share that knowledge before it was gone.

In 1998, NASA-JPL conducted an extensive study into KM. Their research revealed successful outcomes in those organizations that recognized and rewarded people for sharing knowledge and those that captured knowledge by empowering communities of practice.<sup>53</sup> Of all the factors considered, culture was the most important, specifically, “rewarding and acknowledging the importance of knowledge sharing throughout the organization.”<sup>54</sup>

Rewards and recognition are a big part of NASA-JPL’s KM strategy. Of all the organizations researched for this paper, NASA-JPL is the only one that offers monetary

---

<sup>50</sup> American Productivity and Quality Centre (APQC), “NASA and the Jet Propulsion Laboratory: Using KM to Drive Innovation 2003,” <http://www.apqc.org/portal/apqc/site?path=root>; Internet; accessed 25 November 2004, 143.

<sup>51</sup> American Productivity and Quality Centre (APQC), “NASA and the Jet Propulsion Laboratory: Using KM to Drive Innovation 2003,” ..., 143.

<sup>52</sup> *Ibid.*, 144.

<sup>53</sup> *Ibid.*, 144.

<sup>54</sup> *Ibid.*, 144.

rewards to employees for their technical reports that form part of the organization's codified knowledge base. Most awards are worth several hundred dollars to employees although some are worth as much as one hundred thousand dollars for knowledge creation and innovation in the area of software development.<sup>55</sup>

Collaboration is another component of the KM strategy to facilitate knowledge creation, sharing and innovation. "Examples of collaboration include hosting story telling sessions, lessons learned meetings, instructional meetings, and other activities across projects and centres."<sup>56</sup> Due to the complex nature of their business in planning for space missions, NASA-JPL have found that bringing people together in informal face-to-face settings for the purpose of sharing information to be an effective KM strategy. To help employees develop a sense of organizational identity, story telling is used to foster that cultural connection. In a more formal setting at the NASA's Academy of Program and Project Leadership, story telling in the form of project success stories are used to train potential leaders.<sup>57</sup>

IM tools are another essential element of the KM strategy. "Document management, electronic archiving, product data management, enterprise portals, taxonomies, metadata standards, experts' directories, Q&A technical databases"<sup>58</sup> are some of the tools available at NASA-JPL. To demonstrate the value of one of these tools,

---

<sup>55</sup> Ibid., 145.

<sup>56</sup> Ibid., 146.

<sup>57</sup> Ibid., 147.

<sup>58</sup> Ibid., 146.

the technical questions database “features the best questions asked at technical reviews and helps create a virtual presence when key people are not available. The database includes more than 700 questions in 42 subject areas.”<sup>59</sup> During key project milestone reviews, employees are better prepared because they have access to the typical questions to be asked and as such reviews run more smoothly. Time is better spent on dealing with mission issues rather than standard concerns.<sup>60</sup>

Regarding KM leadership, the chief information officer, chief engineer and senior human resources administrator are the champions of the KM activities.<sup>61</sup> The KM team is made up of 55 members from across the agency and their goal is to “find and implement good solutions, fill in gaps, and build an amalgamation of resources to support its missions and research communities.”<sup>62</sup>

The third company, 3M is a highly diversified technology company operating in health care, electronics, telecommunications and office markets. 3M has a work force that compares in size to the CF with 65,000 employees in 60 countries. Compared to the World Bank and NASA-JPL, 3M is the most recent convert to the benefits of KM having begun its program in 2001.<sup>63</sup> “3M defines [KM] as a central competency that enables

---

<sup>59</sup> Ibid., 147.

<sup>60</sup> Ibid., 147.

<sup>61</sup> Ibid., 148.

<sup>62</sup> Ibid., 148.

<sup>63</sup> American Productivity and Quality Centre (APQC), “3M: Using KM to Drive Innovation 2003,” <http://www.apqc.org/portal/apqc/site?path=root>; Internet; accessed 25 November 2004, 111.

every corporate initiative, business process, and individual employee to maximize customer satisfaction, sustainable profitability, and growth.”<sup>64</sup> At 3M, “innovation is the key to growth” and innovation is defined as “the transformation of knowledge into money.”<sup>65</sup>

The way in which 3M promotes knowledge creation, sharing and innovation is by fostering collaboration, offering a reward and recognition program, and making resources available to enable the leveraging of internal knowledge. 3M uses stories to celebrate its successes in product innovation and embedded in its culture is the freedom to explore individual initiatives that may become a possible business for 3M.<sup>66</sup>

3M’s reward and recognition program recognizes the “whole team” for successful product launches. The program is non-monetary and is intended to dismantle the organization barriers that do not promote knowledge sharing. Knowledge sharing is an expectation of its employees and one of 3M’s criteria for promotion<sup>67</sup>

In terms of collaboration, at 3M there are approximately 40 Tech Forums that are “communities that focus on technologies, skills, and interests across the company.”<sup>68</sup>

---

<sup>64</sup> American Productivity and Quality Centre (APQC), “3M: Using KM to Drive Innovation 2003,” ...,100.

<sup>65</sup> Ibid., 100.

<sup>66</sup> Ibid., 102.

<sup>67</sup> Ibid., 104.



Participation in these communities is voluntary although encouraged and looked upon favourably on performance evaluations. They are considered an excellent way to network and share ideas across the company. “All forum meetings are filmed, indexed, and archived.”<sup>69</sup> Each forum is assigned a “senator” and there is also a technical council to support the forums by providing oversight and direction.<sup>70</sup>

The Internet and 3M’s Intranet is well used as a key resource for employees seeking information on the company’s technology platforms. 3M’s Technology Resource Centre and its library and information services are vital to support R&D, education and learning activities. 3M uses Lotus Notes databases to support project teams with knowledge sharing activities and IM. Lotus Notes databases are commonly used by universities as the main support tool for online interactive graduate studies. Other internally developed knowledge repositories and systems include “a technical skills database, technical reports, technical notebooks, records of invention corporate archive, chemical registry, 3M patents, 3M published papers and presentations, and a Lab Forum.”<sup>71</sup> One of 3M’s recognized weaknesses in KM is the lack of a rigorous information and document management system across the organization.<sup>72</sup>

---

<sup>68</sup> Ibid., 105.

<sup>69</sup> Ibid., 105.

<sup>70</sup> Ibid., 105.

<sup>71</sup> Ibid., 108.

<sup>72</sup> Ibid., 112.

On the subject of leadership, awareness of KM as a discipline at 3M began in 2001 when the vice president human resources (HR) launched a research effort to determine the best way ahead. Two full-time KM specialists, based in HR, led the “Knowledge Transformation Project Office.”<sup>73</sup> Today 3M has a KM steering team composed of representatives from various areas throughout the company. Together they have developed six strategies for KM as follows:

- Foster awareness and understanding of KM in the organization.
- Promote high value KM initiatives.
- Leverage existing technology.
- Develop KM methodology and processes.
- Benchmark.
- Maintain sustainability.<sup>74</sup>

3M acknowledges that it “continues to wrestle with how to effectively position its KM effort in the midst of [its] corporate initiatives.”<sup>75</sup> In this regard, 3M has much in common with the DND/CF.

What can DND/CF learn from these case studies? This section will thread together the main lessons from the previous sections and form the basis for a recommendation on the way ahead for a DND/CF KM strategy.

Vital to their business success, we have demonstrated the importance of KM to the private sector in the cases we have examined. A complex subject, KM is more easily

---

<sup>73</sup> Ibid., 111.

<sup>74</sup> Ibid., 111.

<sup>75</sup> Ibid., 116.

understood when expressed in terms of practical examples. Profiling three companies has provided us good practical examples of KM in action and DND/CF can learn from these examples. We see that the lessons learned in the private sector cases are generally reflected within DRDC's strategy, so profiling the companies has also served to reinforce our position that DND/CF should follow DRDC's example.

The common themes throughout the KM strategies seen are the focus on people, the importance of collaboration, the need for a reward and recognition system, the requirement for information management tools, and most importantly, the need for leadership from the top. In all cases examined, KM began as a grassroots effort and in the case of the World Bank they initially attributed their "open and flexible environment of experimentation, original thinking, and innovative ideas"<sup>76</sup> to the lack of an organizational strategy. This shows that a KM strategy should not stifle current KM activities and initiatives rather it should support, encourage and openly promote them.

Collaboration through formal and informal gatherings is common to all three companies and it serves as the backbone to knowledge sharing. Like NASA-JPL, DND/CF must also effectively manage risk and deal with an aging workforce that represents a significant amount of corporate knowledge. Greater emphasis and effort must be put into knowledge creation and sharing through collaborative efforts, guided by a KM strategy.

---

<sup>76</sup> American Productivity and Quality Centre (APQC), "The World Bank: Using KM to Drive Innovation 2003," ..., 170.

Without the proper tools any task including KM is difficult to accomplish. A robust IM and document management system is essential to codify and support knowledge sharing and 3M acknowledges that the lack of such a system across their organization is a weakness of their KM strategy. Similarly, a big challenge to an effective KM strategy within DND/CF, according to this author, is the lack of an enterprise IM system. DND/CF sits atop a junkyard of information and codified knowledge that must be organized in order for an effective KM strategy to take root.

Regarding leadership, KM is most successful in those companies that have their highest level of management engaged. Of the three examples given, the World Bank appears the most successful with its KM strategy and, not surprising, the president of the company has been the leading champion of KM. A DND/CF KM strategy must also be led from the top.

In conclusion, according to the Strategy 2020 vision statement the CF aims to be recognized as a “relevant knowledge-based institution” consisting of multi-skilled people who are focused upon knowledge management and innovation among other things. We understand KM to be about getting the right knowledge to the right people at the right time to improve organizational performance. As we saw, smart organizations continuously enrich the work environment with more timely and relevant information and knowledge to gain the competitive advantage. For these reasons DND/CF must develop its own KM strategy to achieve its vision.

KM has been very much a grassroots bottom up initiative for most organizations, DND/CF being no exception, and we have seen many very good examples of KM in action within DND/CF. We looked at KM strategies and some practical KM applications used to drive innovation at the World Bank, NASA and the Jet Propulsion Laboratory, and 3M, and saw that KM has been vital to their business success. The common themes throughout their KM strategies were a focus on people, the importance of formal and informal collaboration, the need for a reward and recognition system, the requirement for enterprise information management tools, and the need for leadership from the top. We also looked at DRDC's KM strategy that reflects all these themes and as such DND/CF should build on DRDC's strategy and the lessons learned from the private sector.

Having demonstrated the importance of KM to the private sector and having considered their lessons learned as well as the KM strategy at DRDC, we see that DND/CF must develop its own KM strategy that reflects these excellent sources of knowledge.

## BIBLIOGRAPHY

- American Productivity and Quality Centre (APQC). "About APQC." [http://www.apqc.org/portal/apqc/site/generic?path=/site/about\\_apqc/about\\_apqc.jhtml](http://www.apqc.org/portal/apqc/site/generic?path=/site/about_apqc/about_apqc.jhtml); Internet; accessed 25 February 2005.
- American Productivity and Quality Centre (APQC). "3M: Using KM to Drive Innovation 2003." <http://www.apqc.org/portal/apqc/site?path=root>; Internet; accessed 25 November 2004.
- American Productivity and Quality Centre (APQC). "NASA and the Jet Propulsion Laboratory: Using KM to Drive Innovation 2003." <http://www.apqc.org/portal/apqc/site?path=root>; Internet; accessed 25 November 2004.
- American Productivity and Quality Centre (APQC). "The World Bank: Using KM to Drive Innovation 2003." <http://www.apqc.org/portal/apqc/site?path=root>; Internet; accessed 25 November 2004.
- Augier, Mie and Thorbjorn Knudsen. "The architecture and design of the knowledge organization." *Journal of Knowledge Management*. 8, no. 4 (2004): 6-20.
- Babcock, Pamela. "Shedding Light on Knowledge Management," *HRMagazine*, May 2004, 46-50.
- Barbara Waruszynski, "Knowledge Management within the Canadian Defence Environment," Defence R&D Canada, 2001.
- Canada. Department of National Defence. *Defence Research and Development Canada: Knowledge Management Strategy and Framework*. Ottawa: DRDC TN 2003-002, 22 April 2003.
- Department of National Defence. "Benefits Driven Procurement." [http://www.forces.gc.ca/admmat/masis/bdp\\_e.asp](http://www.forces.gc.ca/admmat/masis/bdp_e.asp); Internet; accessed 24 February 2005.
- Department of National Defence. "Canadian Forces Experimentation Centre Mission Statement." [http://www.ops.forces.gc.ca/units/cfec/default\\_e.asp](http://www.ops.forces.gc.ca/units/cfec/default_e.asp); Internet; accessed 24 February 2005.
- Department of National Defence. "Shaping the Future of the Canadian Forces: A Strategy for 2020." [http://www.cds.forces.gc.ca/pubs/strategy2k/intro\\_e.asp](http://www.cds.forces.gc.ca/pubs/strategy2k/intro_e.asp); Internet; accessed 24 February 2005.
- Drucker, Peter F. *A Post-Capitalist Society*. New York: HarperCollins, 1993.

Egmon, Jean, Jim Lee, Darcy Lemons, and Wesley Vestal, American Productivity and Quality Centre (APQC), "Integrating Knowledge Management and Organizational Learning: Final Report 2004," <http://www.apqc.org/portal/apqc/site?path=root>; Internet; accessed 25 November 2004.

Ergazakis, Kostas, Kostas Metaxiotis and John Psarras. "Toward knowledge cities: conceptual analysis and success stories." *Journal of Knowledge Management*. 8, no. 5 (2004): 5-15.

Girard, LCol John . "Defence Knowledge Management: A Passing Fad?" *Canadian Military Journal* 5, no. 2 (Summer 2004): 17-27.

Smith, Alan D. "Knowledge management strategies: a multi-case study." *Journal of Knowledge Management* 8, no. 3 (2004): 6-16.

Soanes, Catherine, Ed., *The Pocket Oxford English Dictionary, Ninth Edition*. Oxford: Oxford University Press, 2002.

The World Bank.

<http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/0,,pagePK:50004410~piPK:36602~theSitePK:29708,00.html>; Internet; accessed 24 February 2005.

Training and Development Community Centre. <http://www.tcm.com/trdev/cops.htm>; Internet; accessed 10 April 2005.

Tzu, Sun. *The Art of War*. Translated and with an introduction by Samuel B. Griffith. Oxford: Clarendon Press, 1963.

United States. United States Air Forces. *Air Force Basic Doctrine*. Washington, D.C.: U.S. Government Printing Office, November 17, 2003.

Waruszynski, Barbara. *Knowledge Management within the Canadian Defence Environment*. Defence Research and Development Canada: file DRDC TM 2001-008, December 2001.