CANADIAN FORCES COLLEGE - COLLÈGE DES FORCES CANADIENNES

NSSC 7 - CESN 7

Managing Knowledge in the Canadian Forces: As Easy as Googling the Generals?

By/par

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Abstract

This paper examines some of the current practices in the field of knowledge management and their applicability to the Canadian Forces. A brief review of the theory of knowledge management is undertaken along with some initiatives in the Department of National Defence. The specifics of tacit and experiential knowledge are discussed, as are the ways they relate to the Military, particularly with respect to memories, experiences and expertise of Canadian Forces members. It is postulated that this storehouse of knowledge is not currently being exploited or shared, and along with this untapped source of serving members, retiring members are also taking this knowledge with them.

To overcome this loss, and to leverage from extant knowledge, it is proposed that knowledge management techniques be employed to a greater degree. This can range from simple collaboration such as communities of practice to gathering and storing knowledge and making it accessible and searchable on-line. Several suggestions for implementation conclude the paper.

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Introduction

> *"You are not here merely to make a living. You are here in order to enable the world to live more amply, with greater vision, with a finer spirit of hope and achievement. You are here to enrich the world, and you impoverish yourself if you forget the errand."*
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> - Woodrow T. Wilson, United State's 28th president, 1856-1924
>
> *"Knowledge exists to be imparted."*
>
> - Ralph Waldo Emerson, 1803-1882

As a traditional, military hierarchy, the Canadian Forces performs at an extremely high level. With a relatively modest defence budget and size, the Canadian Forces is able to do so because of the quality, professionalism and experience of its people. It has been said that the Canadian Forces is sometimes "punching above its weight"[1], indicating that its achievements are greater than would be expected from a force of similar size and budget.

This may be true, and if so, it could be attributed to several tools or causes, such as superior technological advances and weaponry or because of some political or geo-strategic positioning. In fact, it could be because of the dedication and training of its members. It is the latter point, then, that can and should be further exploited to take up Woodrow Wilson's and Ralph Waldo Emerson's challenge, and the key, therefore, may be to leverage the abilities and experience of its members, to share and make available to all, their collective wisdom.

The management of knowledge can enable searching, sharing and understanding what has previously taken place in order to avoid repeating mistakes or in order to facilitate starting an undertaking from an advanced position, that is, forewarned and forearmed. The idea is identifying, extracting and sharing the know-how of many key actors and leveraging modern and appropriate methods for others to gain insight. It isn't necessarily a new way of war-fighting, nor a method to increase lethality or improve logistics efficiency. What it is, however, is a way to learn from others who have faced related problems or circumstances, to understand the circumstances they faced and dealt with, to appreciate their responses and to comprehend the outcome. With a complete background such as this, lessons can be learned and applied in the present.

There are rich and diverse bodies of knowledge in the Canadian Forces, resident not only in print and data, but also in the minds and memories of its members. Apart from

[1] Jane's Defence Weekly. 21 Feb 2005.

doctrine and process laid down in manuals and taught in Canadian Forces schools, there is little transfer of the type of knowledge that has been gained through experience and living. Limited amounts of this knowledge are captured in lessons learned or in memoirs, if written, but there is no widespread, established or readily available method to harvest and share the valuable asset located in the minds and memories. However, a simplified process to group related knowledge, an easy approach to capture it, and a user-friendly method to promulgate it, such as on the Canadian Forces Intranet, the Defence Wide Area Network, using modern search tools such as Google, can facilitate the management and transfer of knowledge, and enhance the Canadian Forces.

The management of knowledge is not just about developing new ideas, but about accessing old ideas that are new to another individual. Modern management literature and practices have grouped many of the initiatives to achieve this under the subject area of Knowledge Management. Knowledge management encompasses a wide variety of tools, management theory, and practices, many of which are applicable to enhance the Canadian Forces. In this paper, some of the technical definitions of knowledge and knowledge management will be presented. Following the introduction of this theme, current examples of some knowledge management practices will be examined, then a case will be put forward that argues why the Canadian Forces should more vigorously pursue successful knowledge management practices now. Finally, after a short synopsis of some more knowledge management theory and applications, a way ahead for the Canadian Forces will be proposed. It is postulated that Knowledge Management can help the Canadian Forces be more effective and relevant by leveraging in-house knowledge.

What is Knowledge?

Before we talk about knowledge management, we must define what we mean by "knowledge". In our daily lives, and at work, we perform a variety of tasks, often learned by doing or by carrying on as we have been taught. These tasks have a system of parameters, are bound by limits, and will generally produce expected outcomes. Related to these tasks are:

- *Data* about how things occur, such as speed, volume, dimensions, displacement,
- *Information* about how the task proceeds, such as when our eyes process that something moved from one state to another and interacted with its environment, and
- *Knowledge* about why the task was completed, to achieve what end and with what results[2].

There are many formal definitions of knowledge in the various texts and treatises on the subject. Presented here are just two:

[2] Many formalized definitions of "data", "information" and "knowledge" have been put forward by knowledge management practitioners, such as Davenport and Prusak, in "Working knowledge: How organizations manage what they know". The examples presented here are a synthesis of some of these definitions.

> *Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of the knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms.*[3]

Another take on the definition of knowledge is:

> *Knowledge is the residue of thinking. Knowledge comes from experience. However, it is not just raw experience. It comes from experience that we have reflected on, made sense of, tested against other's experience. It is experience that is informed by theory, facts, and understanding. It is experience we make sense of in relationship to a field or discipline.*[4]

With these two brief definitions of knowledge, a further refinement is required, namely in terms of the method in which the knowledge has been learned, stored or articulated. A pilot flying a CF-18 does so after reading manuals on aircraft performance and procedures, attending lectures on the theory of flight and the forces of lift, drag, thrust and gravity and being guided through all the steps by an experienced and qualified instructor. Generally speaking, the invariable knowledge in the lectures and manuals is explicit knowledge, and the required responses and reactions to stimuli passed on by the instructor is tacit or experiential knowledge. In *The Knowledge Creating Company*, Ikujiro Nonaka and Hirotaka Takeuchi quote Michael Polanyi's definitions of the two types of knowledge in this way:

> *Tacit knowledge is personal, context-specific, and therefore hard to formalize and communicate. Explicit or "codified" knowledge, on the other hand, refers to knowledge that is transmittable in formal, systematic language.*[5]

The Canadian Forces has long recognized the importance of explicit knowledge. The demonstrated skill and professionalism of its men and women in uniform has shown that a mature and progressive learning environment for this type of knowledge exists. Military human resource strategies to face "…the people challenges of the future" are clearly articulated:

> *The CF recognizes that the knowledge, skills and attitudes that sustain professional military performance need to be formed through a continuous*

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[3] Davenport, Thomas H and Prusak Laurence, *Working Knowledge*. Boston, Harvard Business School Press, 1998, p. 5.

[4] Canada. Department of National Defence. *The Knowledge Revolution – A Literature Review.* (Waruszynski, Barbara), DRDC HQ TR 2000-002. Ottawa: DND Canada, 2000, p. 3, quoting McDermott, R, "Why information technology inspired but cannot deliver knowledge management.". California Management Review, 41, 4, 103(1), summer, 103-117.

[5] Nonaka, Ikujiro and Takeuchi, Hirotaka, *The Knowledge Creating Company*. New York: Oxford University Press,1995, p.59.

learning experience that combines training, education, work experience and self development.

...

Formal education, either through in-service courses or at academic institutions, is an important tool in providing the professional knowledge and in developing intellectual skills…[6]

What is less well understood, perhaps, is the need for the transfer of tacit or experiential knowledge, and the means to transfer it. The experiential aspect of the knowledge adds a framework or background to the experience, and helps describe the many external influences to the outcome of an event. Knowledge management texts further elaborate on the knowledge that "develops over time" and the experience that "provides a historical perspective from which to view and understand new situations and events".[7] It is this type of knowledge that the Canadian Forces should consider as a target for understanding, capturing, codifying as necessary and transferring. It is not currently captured, yet it can provide an important element to the total knowledge piece.

What is Knowledge Management?

Regardless of the type of knowledge discussed, the term knowledge *management* takes on a specific meaning of its own. To be concise, knowledge management is not specifically about information management or information technology.

Knowledge *management* is a "…field that seeks to exploit the combined knowledge, expertise, and experience of an organization's people to improve its productivity, efficiency, innovation, effectiveness, and value."[8] The author of this quote goes on to discuss the importance of information technology as *an* important element but not *the* important element. He further adds aspects of human interaction, knowledge artefacts and uncertainty. The knowledge management system is one that takes all of these characteristics into account and presents the user with the right material at the right time. He adds that the "…goal of knowledge management is to allow members of an organization to systematically exploit the group's body of knowledge." [9]

Put more succinctly, from a knowledge management practitioners website:

"Knowledge Management is a business philosophy. It is an emerging set of principles, processes, organisational structures, and technology applications that help people share and leverage their knowledge to meet their business objectives."[10]

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[6] Canada. Department of National Defence. *Military HR Strategy 2020.* Ottawa: DND Canada, 2002.
[7] Working Knowledge, p.7.
[8] Malafsky, Geoffrey P., *Technology for Acquiring and Sharing Knowledge Assets*, a paper in *Handbook on Knowledge Management 2* , p.85.
[9] Malafsky, p. 98.
[10] The Gurteen Knowledge Website at http://www.gurteen.com/gurteen/gurteen.nsf/0/FA4FF1E80AE19EBA80256836005059EF/

Why Bother?

Most of the current literature on knowledge management speaks of the value of incorporating such a system into commercial organizations. Among others incentives, corporations can gain insight into strengths and weaknesses of their competition, they can get product to market sooner, reduce product development time, innovate as standing practice and reduce costs and increase profits. These corporations have learned some of the basic tenets of knowledge management namely:

- *It's all about getting the right information to the right people at the right time*
- *If we only knew what we know, and*
- *We need to capture and codify our tacit and explicit knowledge before it walks out the door.*[11]

With the right insight, particularly with the wisdom of past actions and their outcomes, corporations become learning organizations and they develop and grow at a quickened pace. For the business world, this can translate into improvements to the bottom line, thinking outside the box, an understanding of how they themselves add value, and finally, but perhaps most importantly, a more empowered workforce. Knowledge management takes the understanding, particularly tacit knowledge, and seeks to make it available across the corporation.

Finally, knowledge management can also provide insight into how the organization works:

> *Knowledge management behaviors include three primary activities: knowledge generation – which describes the way employees improvise and organizations innovate; knowledge integration – which describes how employees transform their tacit knowledge into explicit knowledge by codifying their ideas into the systems of the organization; and knowledge sharing – which describes the socialization process through which employees share knowledge with one another.*[12]

Knowledge Management in the Military Context

The benefits of knowledge management systems are not limited to commercial organizations and their employees. Similar enhancements in performance can be enjoyed by the broad application of knowledge management in a military context. In one application, for example, the US Navy has used knowledge management and underlying technology to achieve knowledge superiority, "…sustainable competitive advantage over

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[11] McElroy, Mark W., *The New Knowledge Management*. Amsterdam: Butterworth Heinemann, 2003, p. 5.
[12] Bontis, Nick and Fitz-enz, Jac, *Intellectual Capital ROI: A Causal Map of human capital antecedents and consequents*. Journal of Intellectual Capital, 2002, Vol. 3 No. 3, p.227.

our adversaries by dramatically enhancing knowledge of the battlespace."[13] This application has a more operational focus, delivering information to on-scene commanders as well long-range planners ashore. The US Navy approach also focused heavily on the marriage of information technology and knowledge management. In its approach, it was recognized that information technology (software, hardware, connectivity) were enablers of information management (relationships, data, mapping) which itself was an enabler of knowledge management.

The US Navy example is one among many where the military has leveraged the gains possible from managing knowledge.

Knowledge Management via Lessons Learned

There are some elements of knowledge management currently practiced by the Canadian Forces, in the form of gathering and disseminating lessons learned. This practice seeks to capture background, reaction and results of events. Major crown projects are obligated to produce lessons learned on completion of their mandate. Many exercises or deployments cap their execution with the production of lessons learned. In fact, most major, non-routine, or noteworthy undertakings become the subject of lessons learned.

In recent years, the US and Canadian Army have established lessons-learned centres for capturing lessons learned. The US Center for Army Lessons Learned was established in 1985, initially to capture lessons learned during army training exercises. In the intervening years, however, and after repeating many mistakes on the actual battlefield, particularly with the increased op tempo of US forces, the centre's mandate was broadened. The centre's mission ensures it "…collects and analyzes data from a variety of current and historical sources, including Army operations and training events, and produces lessons for military commanders, staff, and students." [14] This information is available to the public for unclassified reports, and to internal US DoD audiences for restricted and classified databases. Finding the right information can be challenging, but with a bit of experimenting, and taking advantage of public and military search engines, and purpose-built thesauruses and relational hierarchies, the required publication can usually be located.

The Canadian military has a similar organization at the Canadian Army Lessons Learned Centre in Kingston. Its mission is similar, with a final goal of "…improving the overall operational capability."[15] As with the US centre, inputs to the lessons are gleaned from a mix of post operation reports, post exercise reports, visit reports, other lessons learned publications, training feedback, and observations from subject matter experts. The site, via both internal and public web access, also solicits members to download questionnaires and complete them for relevant, recent and applicable input. Since April 2003, the centre expanded its capability with $1.5 million in funding to improve the

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[13] Bennet, Alex and Porter, Dan, *The Force of Knowledge: A Case Study of KM Implementation in the Department of the Navy*, a paper in *Handbook on Knowledge Management 2* , p.469.
[14] http://call.army.mil/mission.htm.
[15] http://armyapp.dnd.ca/allc/main.asp

centre's web access capability. This initiative was recognized and was awarded a 2004 Canadian Information Productivity Award of excellence, recognizing that its Lessons Learned Knowledge Warehouse "…facilitates the timely capture and analysis of information acquired on domestic and international deployments, and enables other army units to reuse the information to literally 'learn from experience'".[16] One of the outputs of the Canadian centre is a periodical called "Dispatches". In a recent issue, for example (Vol 10, November 2004), the periodical covered lessons learned on Tactical Combat Casualty Care. Synthesizing input from experience gained in the field and on exercise, the centre published a range of information, statistics developed from actual observation, and proposed improvements to train those providing medical care in the battlefield. This output of lessons learned not only shared past experiences, but then went on to engender both professional discussion and more informal discussion on a number of web-sites. In both cases, the result of improvement of knowledge through information sharing was achieved.

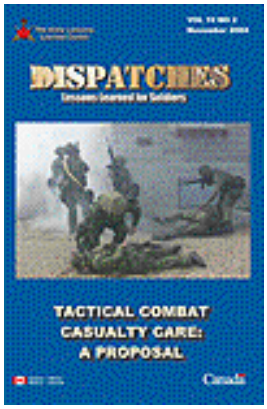

Fig. 1. Cover Page – "Dispatches". (DND Canada)

However, each of these two systems is relatively focused in its applications. They are both currently army-centric, and both concentrate on operations and missions. They do provide, nevertheless, an excellent example of recognition of the importance of gathering and sorting intelligence, awareness and insight, particularly from previous experiences, to apply to future application. What they lack, in the final stage and as seen through the filter of formal knowledge management discipline, though, is analyzing, processing, and applying judgment to what is contained in their repositories. There is a final step needed, moving from possessing data and information towards harnessing the knowledge therein. Nevertheless, this warehouse of experience can be searched for relevant experiences and stories. This leveraging of experiences and learning from the past is one of the key components in the use of modern search tools to learn from the past, perhaps to google the generals or whoever has submitted the lesson learned, to search for knowledge. It is one example of the way in which knowledge management can enhance the learning and effectiveness of the Canadian Forces.

[16] http://cipa.com/award_winners/winners_04/DNDKnowledgeMngmt

Tacit Knowledge and Intellectual Capital

It is important to come back to the issue of tacit knowledge and how it contributes to the overall value of an organization. As was briefly touched on before, a distinction exists between explicit and tacit knowledge, focusing on the type of knowledge captured and shared. Explicit knowledge is easier to recognize and assign a value, because it can often be touched and seen as with manuals, physical data and instructions and printed guidelines. On the other hand, tacit knowledge is more difficult to bracket, although there is more understanding of its contribution to overall value. As acceptance of the value of tacit knowledge, many corporations now recognize tacit knowledge as a component when accounting for *intellectual capital* in their bookkeeping and reporting of corporate assets. Intellectual capital has been proposed an important element in financial accounting of knowledge dependant firms, and is dealt with in the same way as traditional value measures of plant, inventory, and accounts receivable.

Intellectual capital can be subdivided into human, social and corporate capital. Bennet and Porter provide the following amplification of each:

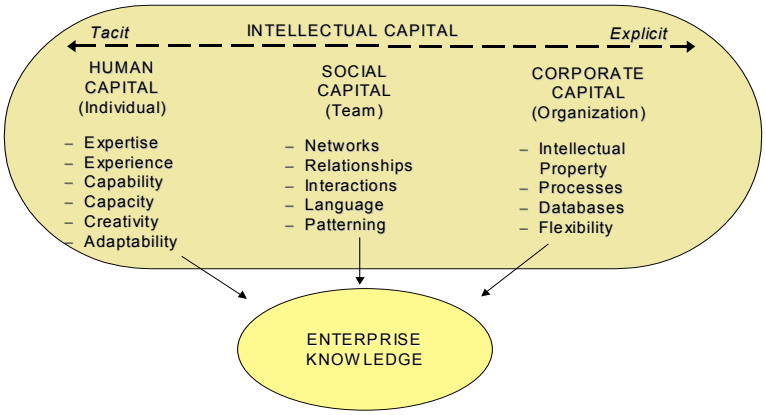

Fig. 2. Intellectual Capital. (Porter and Bennet)

While tacit knowledge is not synonymous with intellectual capital, it can be portrayed as an important component of it. In fact, it could be said that intellectual capital recognizes the need to account for value of the asset, and knowledge management recognizes a requirement to access and deal with components of it. The human capital element of intellectual capital embodies "All individual capabilities, the knowledge, skill, and experience of the company's employees…"[17]; there are many similarities here with what tacit knowledge represents. This point should be kept in mind when trying to position or establish the importance of tacit knowledge.

The United States Navy recognized the requirement to tap into this capital and developed a knowledge management approach and system to do so. This type of endeavour was

[17] Edvinsson, Leif and Malone, Michael S., *Intellectual Capital.* New York: HarperCollins, 1997, p 34.

championed from the top and incorporated into their culture. Intellectual capital has been recognized, in many cases, as *the* value of an organization.

> *"A corporation's success today lies more in its intellectual and systems capabilities than in its physical assets. Managing human intellect – and converting it into useful products and services – is fast becoming the critical executive skill of the age."*[18]

For a military organization like the Canadian Forces, weapons systems and doctrine for their employment are obviously important, but behind their employment, development of future fighting systems, and organizational strength, lies this intellectual capital, embodied mainly in the tacit knowledge. Currently there are few systems in the Canadian Forces to measure the institutional value of this capital. Human capital comprises "…the combined knowledge, skill, innovativeness, and ability of the company's individual employment to meet the task at hand. It also includes the company's values, culture, and philosophy."[19] Without recognition or measurement systems in place, several problems arise. Firstly, the old adage says that what cannot be measured cannot be managed. Without an understanding of where this expertise exists, is in decline or is under threat, it is difficult to formulate plans to address shortcomings. This lack of recognition also hinders attempts to capture and render accessible the shared intellect.

In DND's Military HR Strategy 2020, it is recognized that "…People really are at the heart…" of the department, "…the top priority…" and are "…of fundamental importance…in fulfilling our Defence mission."[20] However, the strategy goes on to address elements of a more explicit nature such as numbers of recruits and retention strategies, alignment with Canadian values, and Chaplaincy. Unfortunately there is little recognition of the true value of what needs to be measured and managed. Adding to the problem is the fact that, of equal importance to understanding and measuring the intellectual capital, is the way in which centres of knowledge interact, the manner in which tacit knowledge is shared and developed and the method by which this transfer and growth is enhanced. Because intellectual capital is not currently measured and accounted for, it is probably not being managed as a tangible asset. However, intellectual capital, and subsequently, tacit knowledge, are as important to the Canadian Forces as they are to any corporation that has more human capital than structural capital.

To overcome similar short-sightedness in industry, much has been written on the subject. Among the many ways to manage the problems, is one proposed in *Intellectual Capital.* This plan delineates the various stages from recognizing to capitalizing on this knowledge. They are:

- *Missionary – identify the problem and convince of the need*

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[18] Quinn, James Brian, et al, *Managing Professional Intellect.* Harvard Business Review. Mar/Apr 96, Vol. 74, Iss 2, p. 81.
[19] Edvinsson and Malone. P. 11.
[20] *Military HR Strategy 2020*, p. i-ii.

- *Measurement – develop metrics and taxonomy*
- *Leadership – act on the insights*
- *Technology – to increase visibility and packaging of the knowledge*
- *Capitalizing – captures both the knowledge and the tools to access it, and*
- *Futurizing – nurture innovation, continuous development as a core competence.*[21]

Obviously, despite the problems with the Canadian Forces Human Resource strategy highlighted earlier, there are some aspects of all of these steps that are being dealt with today. The main emphasis, though, is on explicit vice tacit knowledge, and the more intangible element still remains in the background. Even with recognition of the problem, measurement will be difficult. In corporate settings, progress can be made and measured in terms of customer satisfaction, sales, market share, and expense-to-profit ratios. In the Canadian Forces, aspects of Human Resource progress can be measured, but absolute scales of effectiveness will be difficult to measure. This is not to conclude that an effort to identify, capture, catalogue and disseminate tacit knowledge need not be undertaken.

Current management literature is full of articles describing the importance of intellectual capital and consequently of one of its components, tacit knowledge, to modern organizations. One study took a highly quantitative approach to the valuation of managing intellectual capital, mapping out nodes of positive and negative influence on a corporation and incorporating scores for such items as training, retention, employee satisfaction and percentage of supervisors and professionals. The net result, apart from the value of managing intellectual capital, was the reinforcement of the importance of senior management recognition and buy-in. "Managerial leadership is the foremost antecedent construct in human capital management."[22] The study further emphasized that this leadership would serve as "…a spark for organizational knowledge sharing…".

While a lot of the literature focuses on corporate structures, there is applicability to military organizations. Some of the articles highlight the need to break down hierarchies or invert organizations to make knowledge sharing and leveraging of intellectual capital possible. While this is not easily achieved, nor desirable in the military context, there are many other approaches or views on intellectual capital that are applicable. The strictly defined corporate structure seeks to increase learning to maximize profit, while the military structure will seek to increase learning to maximize effectiveness and to facilitate and enhance the learning process itself. Applicable to the military is the view that intellectual resources could be "…framed as an intangible asset…", "…an ongoing, emergent process", or "…as a socially constructed and shared resource…".[23] In all cases, it pays to *evaluate the intangible assets* of the organization, *analyzing* how they

[21] Edvinsson and Malone, p. 57.
[22] Bontis and Fitz-Enz, p. 241.
[23] Pöyhönen, Aino and Smedlund, Anssi, *Assessing Intellectual Capital Creation in Regional Clusters,* Journal of Intellectual Capital. 2004, Vol. 5, Iss.3, p. 351.

were created and what structural or procedural constructs contributed to the *intellectual capital creation*[24], and how it can continue to be created and shared.

Within the Canadian Forces, following recognition of the value of identifying and understanding tacit knowledge, it will be essential, perhaps, to reflect on ways to better create and share. There will be hurdles because of decades of relying on hard skills, and on learning lessons and gaining experience through time and through doing, but recognition of the value of sharing and dissemination will soon win converts. In an article on Intellectual Capital in the US Army, it is recognized that "...while training programs stress highly structured decision –making processes and countless lists of principles and rules…", experience is an important element. The basic tenet of capturing and sharing tacit knowledge, however, accelerates the experience, and helps leaders "…develop a sense for how seemingly unrelated forces and events interact and how they can shape their environment…"[25], learning through the successes, failures and time-in, of others.

The Value of Tacit Knowledge to the Canadian Forces – Tribal Memories

An important part of knowledge management, and perhaps *the* most important aspect, certainly as far as the original idea of this paper is concerned, is knowledge harvesting. For knowledge management to be effective, the knowledge has to have been created, it has to have been stored, and it has to be accessible in a coherent manner. While the latter points will be addressed later, some emphasis on the implicit step between creation and storing needs to be investigated.

One of the main contentions of this paper is that there is a tremendous wealth of tacit knowledge, experience or intellectual capital in the minds of the officers and non-commissioned members of the Canadian Forces. The more experienced that an individual is, the greater the amount of knowledge and value there will be. This is not to imply that junior members do not themselves possess valuable knowledge. Theirs may be, however, more focused in smaller areas. In both cases, some of this knowledge may have been captured through a member's contribution to lessons learned and doctrinal development. Throughout a career, Canadian Forces members participate in tiger teams, policy review boards, brainstorming, or even the daily give and take of professional discussions. Throughout these fora, the members impart the collective wisdom they themselves have gained through training, structured approaches to learning, and a vast range of experiential living. Finally, a member would have, at one time or another, talked to junior colleagues or peers, and recounted a story of a recent or past event, and through storytelling, shared with them a personal perspective on some event. This story telling often contains many aspects of the collective known as knowledge, namely *what* happened, *why* it happened, *how* events unfolded, *where* the event took place and what preceded the event *when* it happened.

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[24] Ibid.

[25] Stebbins, Steven A., *Building Our Intellectual Capital: The need for adaptive leaders in Today's Army*. Field Artillery. Sep/Oct 2000, Iss. 5, p. 6.

The Canadian Forces publishes a magazine entitled Flight Comment. The magazine is produced by the Director of Flight Safety and is touted as their flight safety magazine, published four times annually. The magazine is primarily aimed at members of the Air Force and each quarter, it provides stories on topics such as developments in aircraft, updates on personnel movements and news in their community. One of the most widely read sections, however, is called "I Learned About Flying from That". In this section, pilots and other aircrew provide stories of near misses that they suffered, and survived. (Where the aircrew did not survive, the stories are only available through Board of Inquiry and often lack the true context of the accident.) The near miss stories contain the rich tapestry of detail that is so necessary to situate the reader as close as possible in the frame of the writer and enable the reader to both understand the event and learn from it. The intent, obviously, is that faced with a similar situation, the reader will not suffer the same fate, having benefited from the wisdom of others.

The importance of this point has apparently not be lost on the editor of Flight Comment, and since the Spring 2004 edition, the location of the various experiential tales contained in the magazine are now formally located under a new section entitled "Lessons Learned". The importance of a system of near miss reporting has long been recognized in other branches of the service. For example, near miss reports among submarine navies are widely circulated in that community. They are, however, often classified and harder to access. [26]

What about the successes? What often separates a near miss from a success can be a great deal of factors, or simply a better judgment call. Again, it is the judgment made at the time, under the circumstances, and weighed against wisdom or experience, that could make the difference. In all cases, however, success, failure or routine event, there are lessons to be learned, captured and shared, and there is knowledge to be shared.

Because change must come from the top, and their warehouse of experience is larger, there is a greater responsibility on senior leaders to share. It could be axiomatic that the longer they serve, and the higher positions they hold, both as senior officers and senior non-commissioned officers, the more valuable are the lessons. However, it is equally self evident that the higher the position, the less time there is pass on these experiences in a formal manner. Occasionally, this knowledge is captured and shared through memoirs. The shortcomings here are several. The author will have an imperfect recollection of events through the years, the timeliness of the lesson learned is decreased, and senior Canadian military officers rarely write memoirs.

In a December 04, 2004 article in *The Kingston Whig-Standard,* award-winning author Major-General Roméo Dallaire (Ret'd) talked about the lack of Canadian military memoirs, citing the pace of "*day-to-day"* bureaucracy that keeps leaders too busy to write. He went on to add how important it is for them to contribute to knowledge sharing, and how they should ensure that they have "…passed on their hard-earned lessons of battle and leadership to their juniors*."* Dallaire further added the importance

[26] It needs to be noted that such sharing in the lessons learned format is fostered through a culture that puts its members sufficiently at ease to expose and discuss shortcomings.

of timeliness for capture and dissemination of this knowledge and experience because with the passage of time, "The farther you get from those who actually did the action, the more diffused it gets and the less credible it gets".[27]

"How about this, Mr. I.R.S. agent: Busy important people forget stuff."

(Harvard Business Review, 2002)

In *Leadership is an Art*, Max DePree highlights the obligation of leadership and "…leaders to communicate, to educate…"[28] via processes that ensure the passing of tacit knowledge from one to the other. He recognizes that teaching doesn't just involve rote skills and procedures laid out in manuals, but touch and feel as well. It is incumbent upon leaders to "…teach not only the skill of the job but the art of it as well." [29] Finally DePree calls these leaders the tribal storytellers, and it is through this process that they pass on and imbue in their employees "…one's historical context, one's binding values."[30] Quite clearly, the passing of tacit and experiential knowledge branches out from mere corporate performance or military proficiency into equally important arenas of ethos, sense of being, and raison d'être.

[27] Ward, John, *Romeo Dallaire back from the edge. Kingston Whig-Standard.* Dec 4, 2004, p.17.
[28] DePree, Max. *Leadership is an Art*. New York: Dell Publishing, p. 40.
[29] Ibid, p. 54.
[30] Ibid, p.82.

Why Now?

Are there outside influences that are driving the need to explore tacit knowledge capture and sharing at this time, or are discussions merely another leap on a business paradigm bandwagon? With a view to demographics, the aging workforce and industry experience, the former seems to be the case. Canadian Forces Military Human Resources Strategy 2020 forecasts a drop of five percent in the projected recruitable cohort in the next 20 years, with an attendant loss of current skills through attrition. The 2001 Canadian Census predicts that "…about 15% of the workforce was within 10 years of retirement…" with "…a fifth of baby-boomers in Canada at least 61"[31] by 2011, well beyond current standards for military employment. The impact that this has is that with the loss of the personnel, there will be an incredible loss of knowledge.

In the US defence and aerospace industry, "…companies are launching knowledge management programs in an effort to mitigate what some are calling a national disaster – the tremendous loss of expertise caused by a decade of budget cuts, downsizing and an aging workforce."[32] There are numerous other industry periodicals arguing the case, couching their points under headlines such as "They can take it with them", "Harvesting the Knowledge of Retirees", and "Harvest employees' collective Wisdom". Regardless of the headline, the story remains the same. There has always been a loss of knowledge through retirement, job changes and attrition, and the rate of loss may be increasing. The time to act to capture tacit and experiential knowledge is now, so that those that remain or join the Canadian Forces can benefit from previous wisdom.

Of course, the case for knowledge management action now could be made even if there were not an increase in attrition. Serving officers and non-commissioned members carry with them knowledge that could be applied right now, to aid in an understanding of why the Canadian Forces has arrived at its particular structure, and what the near-term future may hold. The Canadian Forces Leadership Institute has commissioned a series of reports to debrief serving and past leaders to understand the circumstances that existed when strategic decisions were made. In one such report, The Decade of Darkness, the aim was "…to get an understanding of the nuances within the institution at the strategic level…"[33] during the 1990's from the perspective of senior Level 1 advisors. The report concludes that the leaders of the time performed remarkably well under a set of hard-to-understand circumstances. It adds, however, that today's leaders could benefit from this storytelling, taking advantage to "…learn from these experiences and to use them to guide their own professional development."

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[31] http://canadaonline.about.com/cs/statistics/a/workforcestats

[32] Scott, William B., *Industry's Loss of Expertise Spurs Counterattack.* Aviation Week and Space Technology. March 13, 2000, Vol. 152, Iss. 11, 60.

[33] Sharpe, BGen (Ret'd) G.E. and English, Dr. Allan. *CFLI Project Paper – The Decade of Darkness.* Canadian Forces Learning Institute. Undated.

Barriers to Implementation

Clearly, there will be hurdles in introducing and implementing knowledge management initiatives. However, it has been recognized that the Department of National Defence must leverage its knowledge resources. The Department of National Defence Human Resources Accountability Model Framework document, published in 2001, cites this frequently. A Director General Learning and Professional Development was introduced to foster success, with a mandate "to provide the necessary impetus for the establishment of a broader structure in order to respond to current and future professional needs and to foster a corporate and future life-long learning capability within DND".[34] Some of the key tools to be leveraged in achieving this aim include one that "…embraces the gaining of knowledge…", and perhaps more to the point, "…the exchange of knowledge and ideas among people working together in teams and networks…to expand our intellectual capacity."[35]

However, there remain structural hindrances to adapt such an approach that would prevent, at this time, widespread application and integration in the Canadian Forces. They could include, among others "…ignorance, no absorptive capacity, the lack of pre-existing relationships and lack of motivation.*"*[36] According to DND's HR Accountability document, further risks include lack of buy-in, skills and people shortage, funding, workload, and finally, the need for a culture shift.

The Canadian Forces as a Learning Organization

The greater application of knowledge management to the Canadian Forces will not simply be a case of acquiring a commercial knowledge management software package, nor a case of a directed implementation. Firstly, senior management needs to be convinced of its value, then users need to be convinced of its value, then tools need to be provided and supported, and finally, cultural changes will emerge that are fundamental to successful application of knowledge management.

The Canadian Forces, by nature of its business, is a hierarchical organization. Command in the field, direction of troops, and ultimate responsibility for the actions of an individual unit dictate the philosophy of unity of command and hierarchy. In the purely traditional military setting, therefore, there may not be much change possible. However, in support organizations, the headquarters, schools and many administrative units, changing approaches to traditional hierarchical relations may facilitate new approaches to problems.

The traditional hierarchy tends to push the requirement for big picture information and a strategic grasp of knowledge upward. He or she who is at the top must know the most. By the time the bottom of the unit is reached, an individual may only know a little about

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[34] Canada. Department of National Defence. *HR Accountability Model Framework.* Ottawa: DND Canada, 2001.
[35] Ibid.
[36] O'Dell, Carla, *If Only We Knew What We Knew*. New York: The Free Press, p. 17.

a specific action. In networked organizations, away from the front lines of the battlefield, knowledge can be shared freely, enabling all elements to learn from and contribute to the innovation or development of the organization. This is particularly true where the aim of the learning organization is to increase its "intelligence" through the learning of its individual members. This is the basic tenet underlying the Canadian Forces Human Resources strategy.

The obvious needs and benefits of this are widely recognized. An Assistant Deputy Minister (Human Resources Military) publication, entitled "Strategic Planning Process – Uncertainty, Mitigation, Preparedness", noted the following, in addressing the need for the Canadian Forces to "…sustain itself, transform adaptively, and emphasize proactive preparedness…

> *Concepts such as knowledge management, network society, net-centric operations and many more have become standard terms in leadership lexicons. The next decade will see the organizational structure and culture challenges intensify. One profound challenge will be the increasing salience of sustaining professional development within a context of rapid change, where time may be the most critical scarce resource."*[37]

The document goes on to discuss the needs to share knowledge, to encourage leaders to "…share even the rudiments of a common perspective on the future…"[38], and to achieve organizational learning so that "…the richness of multiple perspectives is opened up, resulting in a deeper, broader perspective of the business and operational environment and possible strategies."[39]

The need for this direction to initially come from the top is reinforced in many business publications. The similar notion of direction from the top for organizational learning and change in the Canadian Forces is reinforced in a study commissioned by the Canadian Forces Leadership Institute. Therein, it is noted that the Canadian Forces needs to "…stimulate learning that involves challenging and questioning the current frameworks and mental models in place. Leadership will play an important part in providing a vision for the future and supporting members in developing skills and creating and sharing knowledge that benefits the entire organization."[40]

Theory on Knowledge Transfer

A closer examination of the type of knowledge transfer postulated for the Canadian Forces in this paper demands a brief explanation of the way in which tacit knowledge is captured and transferred.

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[37] Canada. Department of National Defence. *Strategic Planning Process – Uncertainty, Mitigation, Preparedness*. Ottawa: DND Canada, 2003.
[38] Ibid. p.10.
[39] Ibid. p.10.
[40] Lucas, Colleen M, *Organizational Learning: Towards a Model for the Canadian Forces.* Canadian Forces Leadership Institute, May 2003.

This paper argues that there is a fundamental and important body of knowledge residing in the Canadian Forces, which is not being accessed to its potential, and is in fact, atrophying. To further understand how tacit and experiential knowledge can be shared in the Canadian Forces, there must first be an examination of the differences in capturing and transferring this type of knowledge. The distinction between the two types of knowledge was made earlier, and likewise, there are differences in the way the knowledge is transferred.

A widely accepted model embodying the two types of knowledge and how they interact was developed by Ikujuro Nonaka and Hirotaka Takeuchi in their book, The Knowledge Creating Company. Their model, adapted here by Dr. John P. Girard, demonstrates the interaction between the types of knowledge and the process by which one type becomes another. The use of a spiral is germane because "…all four of these patterns exist in dynamic interaction."[41]

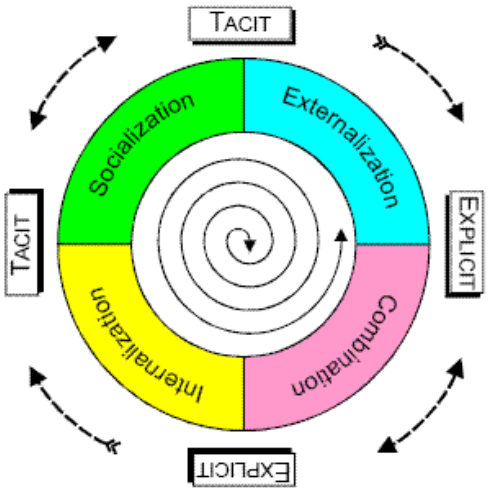

Fig.3. Knowledge Spiral. (Nonaka adopted by Girard)

In general, conversion between the types of knowledge occurs in the following manner:

Tacit to tacit	Socialization. Through social interactions, narrative and storytelling, sharing.
Tacit to explicit	Externalization. Through the articulation and explicit codification of tacit knowledge.
Explicit to explicit	Combination. Once explicitly represented, the process can be automated or performed by Intelligent systems.
Explicit to tacit	Internalization. Gaining knowledge by hands-on Experience. New skills develop and are integrated into Tacit knowledge.[42]

[41] Nonaka, Ikujiro, *The Knowledge Creating Company. Harvard Business Review.* Nov-Dec 1991, 96-104.
[42] Waltz, Edward, *Knowledge Management in the Intelligence Enterprise*. Boston: Artech House, 2003, p.7.

The methods of interest to this paper, therefore, are those that involve tacit knowledge, namely socialization, externalization and internalization. Socialization normally involves contact between individuals, such as learning by apprenticeship. Externalization and internalization are effected when knowledge is transferred by means of concepts, stories, and ideas put on paper. Although the emphasis here is on the latter two, it is generally recognized that a continuous cycle of all four methods of knowledge transfer are required for optimum organizational learning. However, the target is still that tacit knowledge which must be articulated, stored and accessible in order for it to become the rich source of knowledge.

The model presented above, often referred to as the SECI model for the four manners in which knowledge is transferred, has been adopted and expanded upon by other Knowledge Management experts. In the literature, and among knowledge management practitioners, there is another view that this definition or description of pre-existing knowledge is first generation Knowledge Management and we are now in the realm of second generation Knowledge Management.

What distinguishes the two is an advancement in the understanding, or explanation of the way in which knowledge is created. In the New Knowledge Management, McElroy refers to "the knowledge cycle", and details issues of knowledge production, knowledge integration and experiential feedback in the business processing environment. The clear lines between tacit and explicit, and the SECI processes of Nonaka are viewed slightly differently.

Other experts have picked up on this point, and some refer to the end of the second and beginning of the third generation. David Snowden, in Complex Acts of Knowing, states:

> *The third generation requires the clear separation of context, narrative and content management and challenges the orthodoxy of scientific management. Complex adaptive systems theory is used to create a sense-making model that utilizes self-organising capabilities of the informal communities and identifies a natural flow model of knowledge creation, disruption and utilization.*[43]

Several key elements are important. In this model, "knowledge is not a 'thing', or a system, but an ephemeral, active process of relating". Knowledge is later described, in some ways, as both a thing and a flow. The key is to capture that which is ephemeral and render it accessible. In doing so, Snowden further adds several challenges to this activity:

- *Knowledge can only be volunteered; it cannot be conscripted*
- *We can always know more than we can tell, and we will always tell more than we can write down*
- *We only know what we know when we need to know it, human knowledge is deeply contextual.*

[43] Snowden, Dave. *Complex Acts of Knowing: Paradox and Descriptive Self-Awareness*. Special Edition *Journal of Knowledge Management.* Vol 6, No. 2 (May 2002).

Snowden provides a presentation and description of the Cynefin model, which gives a graphic to explain the domains of knowledge.

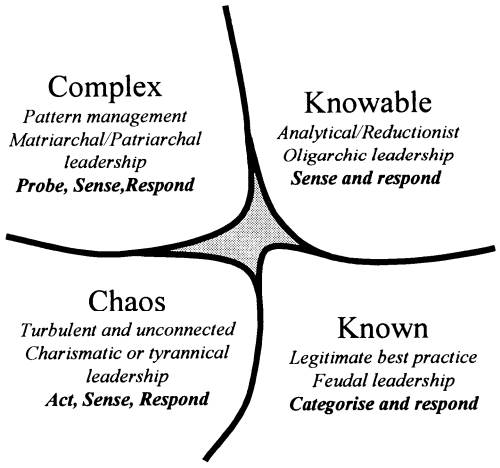

Fig. 4. Cynefin Model. (Snowden)

Simply explained, this model looks at where and how the knowledge was created and the ease or difficulty with which the knowledge would be transferred. For example, in what is to be taken as the upper left quadrant, the space is known as *Informal Interdependent,* where decision making is *Complex.* The lower right quadrant is *Bureaucratic Structured,* where decision making is *Known.*

In the Cynefin model, knowledge can't be touched, it exists only in the brain, and is accessible only through human interaction. To properly extract it requires trained practitioners to frame the questions in order to properly situate the responses. Additionally, knowledge is best dealt with as it comes, and not converted into other storable forms, mainly because the context is fundamental to the value of knowledge itself. The Cynefin model resists concrete models and looks at the larger "…human organizational complexity in its many manifestations…"[44]

A final point needs to be made here on the contextual aspects of knowledge. As we move from the SECI model to the Cynefin model, context becomes more important. In the March/April 1996 edition of the Harvard Business Journal, James Quinn refers to a hierarchy of knowledge ranging from know-how, know-why, know-what through to care-why. Care-why, at the "highest level of intellect" [45], brings in the external aspects of context such as wider systems impact, motivation and creativity. Capturing this context adds a greater degree of difficulty, which will be discussed later.

[44] Ibid. p.1.

[45] Quinn, James Brian, et al, *Managing Professional Intellect. Harvard Business Review.* Mar/Apr 96, Vol. 74, Iss 2, p. 71.

This is only a very cursory overview of several theories of knowledge storage, creation, processing, and so on. What it does speak to, though, is that in an organization as complex as the Canadian Forces, there will be many combinations of all aspects of knowledge management. It is essential, however, to reduce this theory to a practical application that can, by whatever means, put in the minds of others, the experiences of those who have gone before.

Knowledge management texts and articles are full of methodologies for handling, leveraging and profiting from every form of knowledge imaginable. There are artificial intelligence systems, forums, knowledge maps[46], theories and entire fields of study on the subject. But the basics of tacit knowledge sharing can be expressed as capturing and sharing in a common space "…tips, tricks, insights, experiences, and observations…"[47] Once in this space, the knowledge becomes accessible.

Overview of Several Current Products and Practice

To continue to develop as a learning organization, to leverage current practices and knowledge, to benefit from a profound resource of human intellect across the Canadian Forces and to maximize benefit and output, the Canadian Forces can profit from application of selected knowledge management practices. Industry has adopted knowledge management practices to improve innovativeness, strengthen customer relations and increase profitability. Beyond these basic outcomes, however, the benefits are more far reaching in strengthening the organization's underpinnings.

In a similar manner, the Canadian Forces can adopt or chose from among leading knowledge management practices. Several of these will be discussed, including e-mail parsing, communities of practice, narrative capture and competitive intelligence.

Parsing means dividing up a sequential string into smaller units based on a pre-defined set of rules. A sentence, for example, could be parsed into words. A conversation could be parsed into groups, guided by punctuation such as quotation marks. Modern software can parse e-mail messages according to frequency of key words in the text.

Email has become one of the most common methods for communication within the Canadian Forces. Apart from operational exchange of information, which often requires transmission through non-public methods, and application of security classification, common email software on both the Intranet and Internet provides the medium for transmission of ideas. Defense regulations and those governing maintenance of records have ensured that there is a huge, diverse, and information/data rich repository of a written record of communication. Apart from the inefficient waste of personal e-mails, this method of communication is used to exchange ideas, transmit administrative orders, broadcast information to large distribution lists or to problem solve on an interactive and

[46] A knowledge map is a graphical representation of the relationship between elements of knowledge, sections in an organization in which the knowledge is held or used, elements which contribute to the knowledge and how the knowledge is processed.
[47] Davenport and Prusak, p. 147.

iterative basis. E-mail is neither geographically dependent nor reliant on particular time zones, and is therefore an ideal medium for 24 hour a day/7 day a week communications across the Canadian Forces, regardless of a unit's location.

Inherent in the record keeping and storage principles of email handling, the servers contain vast amounts of data that are currently shared in one of several limited ways. The sender and recipient of the email are aware of its content, the email can be forwarded to a third party or printed and passed on, or the email can be discussed face-to-face. What is a lost opportunity, however, is cataloguing and then general access or wide availability of the business discussed in the e-mail across the Canadian Forces.

Commercial vendors sell a range of software that can search e-mail server warehouses, and depending on the field chosen, can search for text strings or subject areas. The resulting searches are then stored in a database for future use. Let's say, for example, that two project officers are exchanging mail on preparing a report to Treasury Board on capital project progress. Over the span of several e-mails, they may discuss deadlines, format, compulsory information and addressees. The tracking software would follow the E-mail chain, and note subject, number of e-mails exchanged, and originator and recipient of the e-mails. Software could also be configured to search the text itself to pull out and weigh key words. Following on with the example, in another project office in another city, staff may have some queries about the same subject for a Treasury Board report for their own project. A search on this database could then highlight who has most recently discussed the issue, and what their e-mail addresses are. In lieu of this direct approach, the second project office would have to rely on a time consuming phone directory search or a crawl through regulations and guidelines to get more information on the reports.

This e-mail tracking and subject compilation would work in any situation where knowledge, information or data exists in stovepipes or isolated repositories. The parsing and storing algorithm opens up to all the availability of contact information for a de facto expert, or, at the very least, someone who has recently had experience with an issue. While the parsing and searching of e-mails is an information technology procedure, the result is a pointer to experts or expertise that can then be utilized for content and knowledge creation.

Communities of practice are an institutional response to experts or those with a shared interest who wish to work together or collaborate on an informal basis. A lunchtime learning seminar on Theatre Missile Defence or a workshop on becoming a better leader might bring together such a group. Communities of Practice are "…distributed groups of people who share a concern, set of problems, mandate or sense of purpose. As (often) informal groups of experts, Communities of Practice serve to reconnect individuals with each other in self-organizing, boundary-spanning communities."[48]

The collaboration can take a number of forms from actual to virtual. In the actual communities of practice, members meet on an informal basis, in the same geographical

[48] Tomye – Communities of Practice web page. http://www.tomoye.com/whatwedo/whatarecops.htm.

area or face-to-face via video teleconferencing. In the virtual communities, collaboration is undertaken via shared cyber space, using whiteboards, chat rooms, bulletin boards and data bases. Regardless of the method, however, several basic principles apply, including:

> *learning is fundamentally a social phenomenon; knowledge is integrated in the life of communities that share values, beliefs, languages, and ways of doing things; the process of learning and membership in a community of practice are inseparable;* and *empowerment, or the ability to contribute to a community, creates the potential for learning.*[49]

In a January 2000 Harvard Business Review article on Communities of Practice, the author recognized the then new concept emerging informally in businesses and government organizations. Even at that early stage, communities of practice were recognized for improving "…organizational performance at companies as diverse as an international bank, a major car manufacturer and a US government agency."[50] The redeeming feature then, as now, was that "Communities of practice can drive strategy, generate new lines of business, solve problems, promote the spread of best practices, develop people's professional skills, and help companies recruit and retain talent."[51]

Five years later, the concept has gained strength and is employed in a growing number of organizations. With the improvements and advances in cyber-technology, search engines and processing power, communities of practice are now greatly aided by technology. The US Department of Defence intends to utilize enterprise software applications for community of practice collaboration "as the core component of its Battle Command Knowledge System (BCKS), which will address the information gathering and sharing needs of soldiers throughout the service."[52] The US Army Corps of Engineers plans to use the same software for its knowledge management environment. In every case, both software facilitated and face-to-face, the communities of practice create a secure and trusted environment to get folks together to share knowledge.

As discussed at the outset, narrative capture is another way to extract knowledge from an individual, and present it in some form for sharing. The capture, however, resists attempts to be automated because of the importance of context to the story or narrative. One such element that impacts on the context, for example, is culture. While it may be clear in the individual's mind that possesses the knowledge, the background or situational elements may be left out of the narrative that actually gets put down on paper. For this reason, narrative capture often necessitates the use of skilled facilitators to bring out the whole detail of the narrative. The goal is to get the individual to communicate knowledge, and to often rely more than they intended, or thought that they possessed. In some cases, a trained interviewer can also reduce the reluctance, for whatever reason, to

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[49] http://www.funderstanding.com/communities_of_practice.cfm quoting the Institute for Research on Learning, at the Xerox Corporation, Palo Alto, CA.
[50] Wenger, Etienne. *Communities of Practice: The Organizational Frontier.* Harvard Business Review, Jan-Feb 2000. p. 140.
[51] Ibid. p. 140.
[52] Tomoye press release. http://www.tomoye.com/ourcompany/news/tomoye_groove

share all the details of a narrative. It is these details, however, that properly frame the story to serve as maximum benefit.

The narrative capture process is also benefiting from a plethora of commercial products that can capture and store the story in digital, video, written and hyper-text formats. The key is to capture the best information, however, not to merely capture a series of anecdotes. The first step, therefore, remains to chose those Canadian Forces members, probably with the most experience, who "…may have knowledge so valuable that it should be available to others…", who are "…recognized by ….managers and peers as being the only expert about something of high importance…" and "…who possess valuable undocumented knowledge…".[53] This first step is not that difficult, as the go-to individual in most units or organizations is often well known.

Competitive intelligence, in the commercial sector, is not that different from military intelligence. It is about assessing all that is known within an organization, and adding to it that which is gleaned from competitors, conversations at trade shows, press releases and general economic trends. In the case of business, the goal is to be more competitive, first to market or otherwise differentiated. In the Canadian Forces context, competitive and business intelligence practices can be harnessed. Various experts have quoted that between eighty and ninety percent of the information that an organization needs to develop and adapt already exists within that organization. The challenge is to locate it and synthesize it.

As in the commercial field, the Canadian Forces could benefit from modern software applications that bring these elements together, and present the information in a tailored manner. One such product, ACIS (Acquisition and Competitor Intelligence System), from the Halifax company, Coemergence, focuses on the gathering of hard and soft data from a variety of sources, facilitating "…the capture and contextualization of key internal and external information to create a clear and continually updated picture of the business landscape".[54] While this software is tailored for activities in the resource sector, such software could be developed or adapted for a wide variety of data gathering in the Canadian Forces. Once held, the data and information can be used to increase the knowledge of its users.

Recommendation for application to the Canadian Forces

Given the imperatives for knowledge management articulated in this paper, the current state of play in the Canadian Forces needs to be base-lined and a way ahead established. As previously mentioned, the Department of National Defence and the Canadian Forces are not starting from scratch. Throughout the late 1980's and early 1990's, business practices of reengineering, Total Quality Management and balanced scorecard enabled the Canadian Forces to find better ways of doing business. The management of knowledge in achieving these initiatives was serendipitous.

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[53] Electric Power Research Institute report. http://www.epri.com/orderableitemDesc.asp?productid=1002876.

[54] Coemergence marketing literature. http://www.Coemergence.com

> *Knowledge management is nothing new for the DND/CF. However, the requirements of the changing world has led us to find new and better ways to create and transfer our collective knowledge and experience…In the 21st century, being more open to – and better at – sharing knowledge just makes good sense.*[55]

In September 2002, the Department of National Defence/Canadian Forces held a two day Knowledge Management Symposium and Workshop, sponsored by the Assistant Deputy Minister(Information Management), Deputy Chief of the Defence Staff, and the Assistant Deputy Minister(Science & Technology). Throughout this symposium, a number of speakers and workshops addressed the current state of the Knowledge Management world and the Department of National Defence/Canadian Forces' place within it. Generally characterized as positive in its outlook, it surveyed best practices both in allied militaries and in business, enabled current practitioners to express their views, and provided a common data point to the over 450 participants. Rather than provide a synopsis of the symposium, it is arguably more valuable to quote from a number of the speakers and participants, and the published summary of the proceedings. An extended number of quotes is presented here to demonstrate that across a wide spectrum, the importance of knowledge management to the Canadian Forces was recognized. In no order of priority, they noted the following:

> *KM is about people exchanging knowledge…Knowledge sharing was described as a key behaviour, key tool, goal and benefit…Ultimately, KM was recognized as a methodology, point of view, strategy, or philosophy that promotes organizational effectiveness by leveraging the individual and collective talents, knowledge, growth and well-being of people. (summary)*

> *Capturing and transferring knowledge is not easy – we need to find and leverage scarce and unique knowledge, we need to reward sharing of knowledge, do succession planning to retain key skills for job delivery and ensure we have the right people with the right skills for now – and for the future. (Margaret Bloodworth, DND, who identified herself as a KM champion)*

> *KM is just another way of solving the bank's business problems…KM solves business problems – not KM problems. (Richard Livesley, Bank of Montreal)*

> *Tacit knowledge…requires video clips, context, community dialogues and storytelling in order to be captured and shared. (Alex Bennet, former CKO US Navy)*

> *The desired end state will be a Defence intranet where shared data resides in a knowledge base…(*but)*…do we know what we have? Do we know what we don't have? Are we ready to share? (Air Commodore David Rennison, UK MoD)*

[55] http://www.vcds.forces.gc.ca/dgsc/pubs/knowledge/article_e.asp

50-85% of the workforce will be retiring within the next 8 years and there are not enough bodies to replace them. This means a talent war over knowledge that is literally walking out the door and that collaborative mechanisms must be put into place in the Federal government to mitigate against the consequences of this phenomenon. (Paul McDowall, Treasury Board Canada)

KM can only be put to work if we first create a culture that is based on trust where knowledge-sharing occurs in a learning-friendly environment. (Conny Sharfe, Head KM, Winterthur Insurance)

The challenge of KM in the military is to reshape the military organization to be more flexible, to shorten the long acquisition and capability cycles, to understand concepts such as empowerment, buy-in and flexible work environments and to avoid "ordering" people to use KM! (Anthony Newton, KM Division, NATO)

We need to convince the staff that KM is a tool to help them get their work done better, faster and that it will ultimately contribute to a better quality of work life…Although the military system is well designed to pass on knowledge, a balance does not currently exist: too much information overwhelms and too little means not enough has been shared…The value added of knowledge transfer for organizational renewal will be in the form of better and faster decisions, greater interdependence and a shared common intent. (Workshop results)

As mentioned earlier, the results of the Department of National Defence/Canadian Forces' Knowledge Management symposium were quoted at some length for good reason. Firstly, they are directly applicable to our needs, arising from participation of our experts and those invited to address our needs. Secondly, they portray a broad understanding of the fundamentals of knowledge management, a recognition of where the Department of National Defence/Canadian Forces currently is in its application and the need to move forward with further initiatives. Finally, they support many of the arguments put forward in this paper that following a comprehension of what knowledge management is and how important it is, it must be pursued vigorously to aid the Department of National Defence/Canadian Forces in achievement of its mandate.

The 2002 Knowledge Management Symposium laid an excellent foundation for advancing knowledge management in the Department of National Defence/Canadian Forces. In April of 2003, a draft of *Knowledge Management Concepts* was prepared by the Director General Knowledge Management Innovation. Its purpose was:

…to permit a broader exchange of critical thought to promote the progress of Knowledge Management and the development of its strategy within DND/CF.

It integrates the content of the KM Concept Paper, feedback from key stakeholders, and valuable knowledge captured during the Canadian Defence KM Symposium and Workshop…[56]

In November of 2003, the Directorate of Knowledge Management was moved from Assistant Deputy Minister(Information Management) to the Vice Chief of the Defence Staff group. Under the Director General of Strategic Change, the Director of Knowledge Management was instructed to lead the Defence department in the application of knowledge management. The specific mandate called for charting "…a course towards a Defence Knowledge Environment (an environment that facilitates k-discovery, creation and innovation, and which fosters the development of a learning organization)."[57] To achieve this, the Director of Knowledge Management has responsibilities such as development of knowledge vision, enterprise-wide strategy, and a knowledge framework.

Unfortunately, even with the output of the seminar, drafting of the knowledge management concepts paper and repositioning of the Knowledge Management Directorate as the *starting point* of wholesale knowledge management adaptation, there is not a lot yet to identify as *progress.* The American Productivity and Quality Centre identifies five stages to implement knowledge management in an organization. They are Get Started, Develop Strategy, Design and Launch KM Initiatives, Expand and Support and, finally, Institutionalize KM.[58]

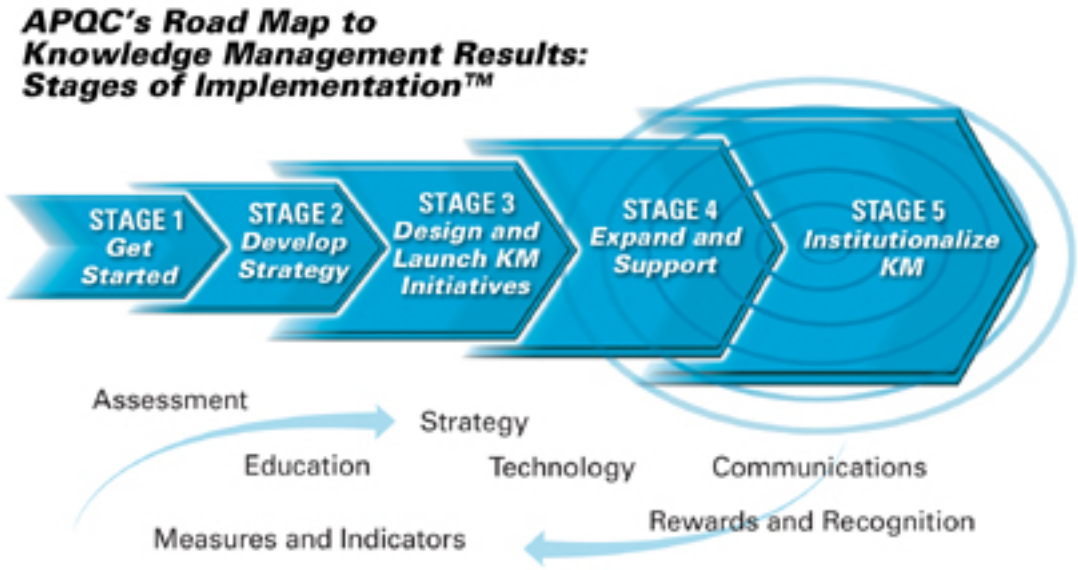

Fig. 5. Roadmap to Knowledge Management. (APQC)

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[56] *Draft Knowledge Management Concepts*, foreward, p. ii, Director General Knowledge Management Innovations. Ottawa: DND Canada, 2003.
[57] Canada. Department of National Defence.Vice Chief of the Defence Staff/Director of Knowledge Management mandate – reference location unknown.
[58] O'Dell, Carla. *The Executive's Role in Knowledge Management*. Houston: APQC, 2004, p. 17.

The Department of National Defence/Canadian Forces are currently in stages 2 and 3. What it will take to move forward is a revitalization of the initiative, a review of its strategy, unencumbered leadership, vision and support from the Deputy Minister and Chief of the Defence Staff, staffing and funding for specific and numerous knowledge management billets, and then successes to be identified, articulated and emulated.

Within that context, the following steps are required:

- Commitment from the top – Arguably, there is a lot going on at the Department of National Defence/Canadian Forces right now. Budgets, Defence and Foreign Policy reviews, transformation and an unrelenting demand on Canadian Forces resources make it difficult to focus on another initiative that demands a commitment. However, it is also exactly the reason why knowledge management is so important. Once championed and launched, knowledge management implementation holds out the promise of relieving pressure and making the organization more effective, thus freeing up assets for other initiatives.

- Identification of where gains can be achieved and then demonstrated – Nothing succeeds like success. Theory, seminars and strategies can go only so far in carrying an initiative. In order to achieve better results, however, actual real world successes need to be achieved. As stated earlier, there is already a growing body of success, such as with the Army lessons learned, Flight Comment and a number of other smaller Department of National Defence/Canadian Forces initiatives. The key to success will be to expand on these, apply them in other venues, and then demonstrate how they have helped and how others can adopt them. Again, this needs to be done and captured within the Department of National Defence/Canadian Forces overall strategy.

- Execution of several initiatives – Discussion and planning is one thing. Crossing the activation threshold and actually doing something is another. Therefore, it will be incumbent upon local knowledge management champions to initiate practices, to demonstrate and advertise their successes, and to readily expand (share knowledge) their practices. In this way, knowledge management can spread by word of mouth, and future practitioners will be able to view, understand, and select those activities that will be of greatest value to their specific requirements. For example, a Base Commander in Winnipeg may find that a particular application of Communities of Practice in Ottawa or narrative capture on the West Coast would best help with one of his particular problems. By understanding and emulating successes, with broad similarity to his own applications, implementation will be easier.

- Plan-Do-Check-Act – The Plan-Do-Check-Act model, utilized in the implementation of many new ideas, gets an organization off top-dead

- Advertise – Like the principles themselves that knowledge management espouses, the successes achieved, challenges faced and overcome, and critical success factors of all initiatives need to be widely promulgated and shared, available to all. This could be done in a manner of ways, tailored to the particular application and success. For example, just as Human Resources and Official Languages have an insert in the Canadian Forces' Maple Leaf publication, knowledge management could distribute a monthly summary of what was going on in the field. This grassroots level of promulgation would ensure wide exposure to the constituency that could most effect change.

The foregoing steps provide a rather generic roadmap for knowledge management implementation. Within this framework are a number of specific initiatives. Some of them have already been started or tried in a part of the Department of National Defence/Canadian Forces and some of them have not been rolled out, but should be explored for pay back or likelihood of an easy win. The following comprise three areas that could be evaluated.

The Army Lessons-Learned Centre in Kingston was described in some detail. It has a current framework, methodology, and underlying IT infrastructure. It is producing quantifiable results, and is supported by its users and intended constituency. Such a centre could easily be rolled out in other Department of National Defence/Canadian Forces areas. For example, the Navy could take advantage of it for the Halifax Class Frigates. Lessons learned in operations, maintenance and employment could be captured from one ship, and disseminated across the class. This is one area in which lessons learned would have substantial pay back. From ship to ship in a class, the employment, equipment and training are relatively standardized. What is unique, however, are the experiences lived and actions taken in different exigencies. This type of knowledge is valuable, and easily transferred from ship to ship. Application of a structured lessons learned methodology would provide quantifiable and productive results.

As stated throughout current knowledge management literature, demographic and changing market conditions are resulting in a lot of tacit knowledge walking out the door. In limited applications, this is being overcome by rehiring of talent as reservists, consultants or senior mentors. This practice, however, only scratches the surface of stemming the loss. Available knowledge harvest practices, software and applications, can provide a method for addressing this problem immediately. As well as widespread application to a great number of retirees, current knowledge harvest methodologies then permit near universal search and access of this knowledge and tacit experience. Subsequently, modern search engines permit googling the Generals to understand historic

context, rationale, and response. This application, of course, can also apply to mid-level officer and non-commissioned member retirees, and upon successful application, perhaps to anyone who is posted from one job for another. This practice then would formalize the turn-over procedure, and produce a permanent record for the benefit of a wider audience.

Communities of practice can serve to connect geographically disparate but contextually similar individuals. In the era of transformation, change and application of disciplines such as modern human resources, comptrollership, project management, and tactical development are widespread. At the same time, however, by nature of the size of the Department of National Defence/Canadian Forces and geographical dispersion, there may be limited sharing of ideas. These facts readily support the introduction of numerous communities of practice to support participants. Initiation and growth of communities of practice really needs to come from the grassroots, the users themselves. But at the institutional level, the underlying support, guidelines, and technical instruments need to be provided and supported. As well, with the initiation, implementation and advertisement of several successes, there will more likely be a groundswell of support and interest from a wider community of communities.

As with any, or all of the above ideas, Information Technology is a necessary but not sufficient ingredient. The application of the above ideas needs a modicum of structure, policy, control and hardware infrastructure, but only insofar as the knowledge management activity requires. There must be great caution to not simply automate or institutionalize a current bad practice. Knowledge management initiatives must first start with the soft idea, then with the support of a community, and only then, although fairly rapidly, with the information technology tools required, such as commercial community of practice software, tacit knowledge data base search engines, and other applied packages.

Conclusion

This paper set out to describe knowledge, knowledge management and how elements therein could be applied to the Canadian Forces. Following a description of the definition and a review of the theory, it was argued that a large body of experiential or tacit knowledge is going untapped. There are some practices that address this shortcoming, such as storehouses of lessons learned and limited capturing of the narrative and recollections of retired generals, but by and large, not enough is being done.

The Canadian Forces continues to face daunting challenges of transforming itself while meeting operational commitments. In the meantime, the workforce continues to age, and although recruiting is still able to bring sufficient numbers through the doors, training and developing an experienced officer and non-commissioned member corps takes time. The Canadian Forces cannot afford to lose the knowledge it has developed, nor repeat costly or time consuming errors.

To face this challenge, several modern knowledge management practices were suggested. More importantly, it was argued that a culture where the value of tacit and experiential

knowledge is recognized, as a first step, needed to be developed. From this starting point, the Canadian Forces could then capture, share and continue to build upon its vast capital of knowledge and experience. Civilian industry, and the American military is showing the way with best practices in knowledge management.

Knowledge Management can be used as a tool to improve the Canadian Forces. It won't, however, be as easy as googling the generals. Before knowledge can be accessed, it has to be identified and put in a format that can be searched. Barriers that may inhibit sharing knowledge have to be overcome, and resources need to be directed. In the final analysis, simplified search engines will only be one piece of the total solution.

Change won't come easily, but the expertise that the Canadian Forces should seek to assist in sustaining, transforming and growing should not be allowed to disappear. Those that possess it now have just left, or are still among us. It is therefore incumbent upon senior management to react now and preserve this knowledge capital.

Bibliography

Books

Anderson, Neil et al, *Handbook of Industrial, Work and Organizational Psychology, Volume 1*. London: Sage Publications, 2001.

Beerli, Alfred J. et al, *Knowledge Management and Networked Environments.* New York: AMACOM, 2003.

Davenport, Thomas H. and Prusak, Laurence, *Working Knowledge.* Boston: Harvard Business School Press, 1998.

DePree, Max, *Leadership is an Art*. New York: Dell Publishing, 1990.

Edvinsson, Leif and Malone, Michael S., *Intellectual Capital.* New York: HarperCollins, 1997.

Gladwell, Malcom, *The Tipping Point.* New York: Back Bay Books, 2002.

Harvard Business School, *Harvard Business Review on Knowledge Management.* Boston: Harvard Business School Press, 1998.

Haytmanek, Alice, *Capturing Knowledge From A Shifting Workforce.* Houston: American Productivity & Qulaity Center, 2003.

Holsapple, Clyde W., *Handbook on Knowledge Management 2*, Berlin: Springer-Verlag, 2003.

McElroy, Mark W., *The New Knowledge Management.* Amsterdam: Butterworth Heinemann, 2003.

Nonaka, Ikujiro and Takeuchi, Hirotaka, *The Knowledge Creating Company.* New York: Oxford University Press,1995.

O'Dell, Carla and Grayson, C. Jackson, Jr, *If Only We Knew What We Know.* New York: The Free Press, 1998.

O'Dell, Carla, *The Executive's Role in Knowledge Management.* Houston: American Productivity & Quality Center, 2004.

Senge, Peter M, *The Fifth Discipline.* New York: Currency Doubleday, 1990.

Topping, Peter A., *Managerial Leadership.* New York: McGraw-Hill, 2002.

Waltz, Edward, *Knowledge Management in the Intelligence Enterprise.* Boston: Artech House, 2003.

Published Reports

Lucas, Colleen M, *Organizational Learning: Towards a Model for the Canadian Forces.* Canadian Forces Leadership Institute, May 2003.

Canada. Department of National Defence. *HR Accountability Model Framework.* Ottawa: DND Canada, 2001.

Canada. Department of National Defence. *Military HR Strategy 2020.* Ottawa: DND Canada, 2002.

Canada. Department of National Defence. *The 4th Meeting of the ADM(HR-Mil) Human Resources Advisory Board.* Ottawa: DND Canada, 2003.

Canada. Department of National Defence. *Strategic Planning Process – Uncertainty, Mitigation, Preparedness.* Ottawa: DND Canada, 2003.

Canada. Department of National Defence. *Defence Information Strategy 2020.* Ottawa: DND Canada, 2003.

Canada. Department of National Defence. *The Knowledge Revolution – A Literature Review.* (Waruszynski, Barbara), DRDC HQ TR 2000-002. Ottawa: DND Canada, 2000.

Canada. Department of National Defence. *Working Towards a Knowledge Management Strategy.* (Waruszynski, Barbara), DRDC HQ TM 2000-003. Ottawa: DND Canada, 2000.

Canada. Department of National Defence. *Knowledge Management Within the Canadian Defence Environment.* (Waruszynski, Barbara), DRDC HQ TM 2001-008. Ottawa: DND Canada, 2002.

Journal Articles

Bednar, Chris, *Effective Ways to Capture Knowledge.* Knowledge Management Review, March/April 1999, Iss. 7, 26-29.

Bontis, Nick and Fitz-enz, Jac, *Intellectual Capital ROI: A Causal Map of human capital antecedents and consequents*. Journal of Intellectual Capital, 2002, Vol. 3 No. 3.

Canada. Department of National Defence. *Tactical Combat Casualty Care.* Dispatches. The Army Lessons Learned Centre, Vol. 10, No. 2. Ottawa: DND Canada, 2004.

Gilmour, David, *How to Fix Knowledge Management.* Harvard Business Review, October 2003, 16-17.

Girard, LCol John, *Defence Knowledge Management: A Passing Fad?* Canadian Military Journal, 2004, Vol. 5, No. 2.

Grace, Audrey and Butler, Tom, *Beyond Knowledge Management: Introducing Learning Management Systems.* Journal of Cases on Information Technology. Jan-Mar 2005, Vol. 7, Iss. 1, 53-71.

Himmelsbach, Vawn, *Army Puts Lessons Learned into Knowledge Database.* Technology in Government. Dec 2004, Vol. 11, Iss. 9, 20-21.

Kiyonaga, Nancy B., *Today is the Tomorrow You Worried About Yesterday.* Public Personnel Management. Winter 2004, Vol. 33, Iss. 4, 357-361.

Kurtz, C.F. and Snowden, D.J, *The New Dynamics of Strategy.* IBM Systems Journal, Vol. 42, No. 3, 2003, 462-483.

Lackey, Scott W., *Putting Knowledge Reachback Into Practice.* Military Review. Mar-Apr 2003, 12-23.

Marwick, A.D., *Knowledge Management Technology.* IBM Systems Journal. Vol. 40, No. 4, 2001, 814-830.

McIntyre, S.G. et al, *Knowledge Management in the Military Context.* Canadian Military Journal, 2003, Vol. 4, No. 1.

Michelman, Paul, *What Leaders Allow Themselves to Know.* Harvard Management Update, Feb. 2004.

Nonaka, Ikujiro, *The Knowledge Creating Company.* Harvard Business Review. Nov-Dec 1991, 96-104.

Papmehl, Anne, *Accounting for Knowledge.* CMA Management. Mar 2004, Vol. 78, Iss. 1, 26-29.

Patton, Susannah and Low, Lafe, *Putting the Pieces Together.* Darwin. Feb 2002, Vol. 2, Iss. 2, 34 – 40.

Pöyhönen, Aino and Smedlund, Anssi, *Assessing Intellectual Capital Creation in Regional Clusters,* Journal of Intellectual Capital. 2004, Vol. 5, Iss.3,. 351-366.

Quinn, James Brian, et al, *Managing Professional Intellect.* Harvard Business Review. Mar/Apr 96, Vol. 74, Iss 2, 71-81.

Scott, William B., *Industry's Loss of Expertise Spurs Counterattack.* Aviation Week and Space Technology. March 13, 2000, Vol. 152, Iss. 11, 60.

Snowden, Dave. *Complex Acts of Knowing: Paradox and Descriptive Self-Awareness*. Special Edition Journal of Knowledge Management. Vol 6, No. 2 (May).

Stebbins, Steven A., *Building Our Intellectual Capital: The need for adaptive leaders in Today's Army.* Field Artillery. Sep/Oct 2000, Iss. 5, 6-10.

Tobin, Tom, *The Top 5 Reasons You Need KM-Today.* KM World. Nov/Dec 2004, Vol. 13, Iss. 10, S11.

Wenger, Etienne C. and Snyder, William M. *Communities of Practice: The Organizational Frontier.* Harvard Business Review. Jan-Feb 2000.

Newspaper Articles

Ward, John, *Romeo Dallaire back from the edge.* Kingston Whig-Standard. Dec 4, 2004, 17.

Wilkie, Helen, *Harvest Employee's Collective Wisdom.* The Globe and Mail. Nov 19, 2004, C1.

Miscellaneous

Canadian Information Productivity Awards, 2004 announcement, http://www.cipa.com/award_winners/award_winner.html, accessed Jan. 2005.

Canadian Workforce Statistics. www.Canadaonline.about.com/cs/statistics/a/workforcestats.htm, accessed 31/01/05.

Carla Carter & Associates, *Knowledge Management Whitepaper,* accessed via www.changeexcellence.com, Jan. 2005.

Coemergence Corporate Brochure. www.coemergence.com/index.html, accessed 01/26/05.

Jane's Foreign Review. *Canada struggles to define military role – Is it 'punching above its weight'.* Posted Feb 12, 2005.

Sharpe, BGen (Ret'd) G.E. and English, Dr. Allan. *CFLI Project Paper – The Decade of Darkness.* Canadian Forces Learning Institute. Undated.

Tomoye Communities of Practice. Corporate Brochure. www.Tomoye.com/Whatwedo/whatwearecops.htm, accessed 07/02/05.