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Best Practices for Knowledge Management Within the Naval Aviation Enterprise

CAPSTONE REPORT

Gabriel V. Edwards
Lieutenant Commander
United States Navy

University of Oregon
Applied Information
Management
Program

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Academic Extension
1277 University of Oregon
Eugene, OR 97403-1277
(800) 824-2714

Approved by

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Dr. Kara McFall
Director, AIM Program

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United States Navy

Abstract

Absent a viable knowledge management strategy, organizational effectiveness declines, including within Aviation squadrons of the United States Navy. The recent declines in retention of aviation officers and the short career cycles of the squadron pilots have helped to erode the body of knowledge that should be alive within each unit. Grounded by the information industry's best practices and Navy doctrine, this research organizes and prioritizes the assets and functions of knowledge management strategies.

Keywords: *Navy, Naval, aviation, aviator, enterprise, knowledge, management, retention, military, resource, practices, planning, mission, data, risk*

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Introduction to the Annotated Bibliography

Problem Description

The United States Naval Aviation Enterprise is currently engaged in global operations, and available resources are focused on enabling forces to win their current engagements (Babb, 2010). The Enterprise faces challenges across a number of areas. Though the demand for capabilities, assets, and resources remains high overall and throughout the Department of Defense (DoD), the typical Navy squadron remains less than well suited to perform the most dynamic missions (Snodgrass, 2014). In this context, dynamic missions are defined as missions that have multiple or supporting assets or agencies, are performed in denied or hostile environments, or have other complexities. These missions are usually sensitive, high profile, or performed in high risk environments (Babb, 2010). The Enterprise must plan and program for future contingencies, requiring success in the competition for ideas, innovation, resources, talent, information, and technology ("Naval Special Warfare Knowledge Management Strategy," 2016).

Personnel issues impacting squadron readiness stem mainly from poor retention, highlighted in a 2014 white paper published by the United States Naval Institute and authored by US Navy Commander Guy Snodgrass, then the Prospective Executive Officer of Strike Fighter Squadron 195. High deployment tempo, lack of the assignment of relevant tactical missions, and a high burnout rate over the daily assignment of menial tasks irrelevant to the growth of aviation skill or specific mission knowledge were all prevalent factors in the original survey research performed that negatively impact squadron readiness (Snodgrass, 2014).

The retention of most Naval aviators is finite by design (Snodgrass, 2014). Because Naval aviators rotate frequently and are not permitted to remain in one operational squadron for longer than three years, the Enterprise does not necessarily accommodate the best practices for employee retention that are utilized by the rest of the information sector (Buss, 2013; Ferguson, Huysman, & Soekijad, 2010). High turnover and burnout rates and a high operational tempo have driven many out of the force, leaving those who remain short on mission aptitude and know-how (Snodgrass, 2014). The constant turnover of active duty squadrons in the United States Navy is not conducive to the enhancement of community expertise, mission specialization, or proper knowledge retention and management (Snodgrass, 2014).

The typical aviator arrives at the squadron from flight school, then completes initial tactical training, a deployment, post-deployment advanced mission training, and another deployment before finally leaving the squadron, all within 2.5-3 years (Snodgrass, 2014). In many cases, the pilot departs his or her initial squadron of assignment for non-flying shore duty, staff duty, or some other non-tactical application, and may return to flying in two to five years, in most cases. After completing a lateral specialty conversion, some pilots never return to flying. As a result of this typical assignment rotation, the knowledge gained by an individual pilot is not easily passed to others, and there are limited means to build a central store of knowledge that is useful for the training and continued growth of the Enterprise (Snodgrass, 2014).

The lower relative knowledge of the Naval aviators that are left after the turnover of more experienced colleagues is caused in part by inadequate transfer of knowledge (Zheng, Yang, & McLean, 2009). Ensuring that the connection of the whole mission cycle – planning, execution,

and post-execution tasks – meets with the most recent and pertinent organizational mission knowledge, will help to enhance the mission capability and therefore the relevant tasking of other aviation squadron assets, which should, in turn, serve to improve the reputation and enhance the mission applicability of the Naval Air assets that can be assigned to dynamic and complex missions ("Naval Special Warfare Knowledge Management Strategy," 2016; Zheng, Yang, & McLean, 2009).

Naval air missions are expected to remain the same in number and complexity for the foreseeable future, while squadron operational resources – specifically airframes and manpower – are anticipated to continue to lag demand (Buss, 2013). In order to prevail in these mission areas, the Enterprise must enable the warfighting aviator at the lowest echelons of the organization to effectively achieve decision superiority by connecting, educating, and sharing knowledge at every possible opportunity (" Naval Special Warfare Knowledge Management Strategy," 2016).

One potential solution for the Naval Aviation Enterprise to protect operational relevance and mission effectiveness is to implement practices to effectively and efficiently capture and redistribute existing tacit, explicit, and implicit knowledge at every opportunity (Zheng, Yang, & McLean, 2009). Knowledge management has been an effective means of knowledge capture and transfer for both private and public organizations (Zheng, Yang, & McLean, 2009). For the purposes of this study, the official definition of knowledge management from the United States Navy is used: a concept that "systematically brings together people and processes, enabled by technology, to affect the exchange of operationally relevant information and expertise to increase organizational performance" (Knox, 2012, p. 1).

The proper capture, organization, and exchange of knowledge across organizations, generations, and locations is a human activity, requires a culture of connectedness, and is the responsibility of all personnel assigned to a particular unit (King & Marks Jr., 2008). For the military, streamlining critical knowledge management processes maximizes efficiencies in force generation and provides opportunities to increase operational resources (Zheng, Yang, & McLean, 2009). The ability to quickly and reliably leverage organizational knowledge can create sustainable competitive advantage for squadrons in the Navy specifically (Zheng, Yang, & McLean, 2009).

Although doctrine suggests that there is a need for centralized information distribution and knowledge management in the Naval Aviation Enterprise, there are no permanent centralized solutions, either proposed or mandated, that explain design-specific solutions to be realized across the Enterprise (Halvorsen, 2014). At present, there are no directives that institutionalize knowledge management operations, assign roles and responsibilities related to knowledge management implementation and maintenance, or direct knowledge management operations across the Naval Aviation Enterprise to enhance decision support, collaboration, information sharing, or synchronization (Halvorsen, 2014).

While a standard centralized solution for knowledge management does not currently exist in the Navy, the number and complexity of available knowledge sharing tools and technologies are increasing, as generational digital natives become more ingrained in the Naval Aviation organization (Halvorsen, 2014). Operational aviators require the best in industry capabilities to accommodate increasing demand for information integration, which in this context applies to the fusion of cognitive models and the analysis of multiple determinants of cognitive processes through concept, decision, and

action (Anderson, 2014). The same requirements also drive real demand for Naval Aviation decision-support related systems (Halvorsen, 2014). To fill these needs, the Enterprise requires transformation from information-centric mission planning models to knowledge-centric, whole-mission models and the ability to innovate solutions, especially in the case of complex contingency operations (Peck, Kemmet, McGowan, Hodgin, & Peintner, 2012). Without research on the use of modern systems and methods to capture and retain knowledge, the Naval Aviation Enterprise cannot be expected to grow more diverse while retaining organizational knowledge and mission expertise in the most fiscally prudent and effective way (Halvorsen, 2014; Snodgrass, 2014).

This Capstone research project focuses on the issues caused by the lack of institutionalized knowledge capture and retention across the Naval Aviation Enterprise. The research provides descriptions of the current challenges posed by the lack of centralized knowledge management in complex and globally distributed enterprises, as well as best practices in the field of knowledge management and how they are applied across similar enterprises. The study considers best practices in management operations and roles and responsibilities related to knowledge management implementation and maintenance, with a focus on knowledge management best practices for complex and globally distributed organizations.

Research Question

Main question. What are best practices for successful implementation of specific knowledge management strategies that can be applied to aviation squadrons in the United States Navy?

Sub-question. How can knowledge management be used to promote effective knowledge capture and dissemination in aviation squadrons in the United States Navy?

Audience Description

The audience for this study consists of upper-level management personnel who have the authority to allocate the resources required to implement and maintain knowledge management systems and processes. In this specific organization (Naval Aviation Enterprise), people with the ability to make decisions on proposals like those that will likely stem from this study are the Squadron Commanders (O-5 Level), Type Wing Commodores (O-6 Level), and the Commander of Naval Air Forces (O-8/O-9, two- or three-star Admiral level). These organizational decision makers are the key stakeholders to whom the research and any resulting proposals are targeted. Gaining consensus between these stakeholders in the interest of furthering the relevant mission employment of Naval aircraft and their associated resources is the ultimate goal of the study.

Search Report

Search strategy. Knowledge management resources are rather easy to find on the UO Library website, and can also be found easily through Google Scholar searches. Searching for knowledge management resources returns an extremely large number of hits. Using quotation marks to ensure that both words are included in the same order as a

text string in the results returned is an important limitation. Adding other terms in the process helps to limit the search results returned. The exact phrase *knowledge management* is used, and when used in conjunction with any of the words *navy, military, defense,* or *government,* yields improved results.

Since Google's advanced search interface is more feature-rich than that of the University of Oregon Library website, it is beneficial to use the Google Scholar search engine to quickly mine articles, read abstracts, and find related sources. Once sources are located, it is relatively uncomplicated to enter them in the University of Oregon Library search engine to find the full text of the article. The Virtual Private Network (VPN) provided by the University is a key component that makes this plan executable.

Documentation method. Documentation of the searches, terms, resources, and local file locations is maintained in a working Microsoft Word document. The document is updated each time search terms are entered or modified, sources are located and downloaded, and databases return results of promise. Local hyperlinks are updated for the locations of the documents on the research computer used for the study, and the sources are uploaded to Dropbox for later access.

Keywords. The alphabetical list of search terms (used in a great number of combinations) follows:

- *Air*
- *Army*
- *Asset*
- *Aviation*
- *CIO*
- *Defense*
- *DoD*
- *DoN*
- *Flight*
- *Government*
- *KM*
- *Knowledge*

- *Management*
- *Military*
- *Naval*
- *Navy*
- *Pilot*
- *Resource*
- *Squadron*
- *States*
- *United*

Search engines and databases. Starting with the addition of the search term *navy*, a number of relevant results are returned immediately from the following repositories:

- University of Oregon Library Holdings
- Academic Search Premier
- Proquest
- EBSCOHost
- Emerald A-Z Current Journals
- Ebrary Academic Complete
- Literature Resource Center
- JSTOR
- Elsevier BV

Search engines. The two search engines used are:

- University of Oregon Library
- Google Scholar

Reference Evaluation Criteria

The reference evaluation criteria provided by the University of Florida Center for Public Issues Education are used to evaluate potential reference sources for this study. The five key criteria used in the evaluation of sources are *authority, lack of bias, quality,*

timeliness, and *relevancy* (University of Florida Center for Public Issues Education, 2014). Each of these criteria contains multiple facets to guide in the evaluation of research sources.

Authority. Scholarly sources are attributable to an author, set of authors, or an editorial staff. Credentials are examined briefly for published works, but more deliberately in the case of white papers or other less formal research performed on the Naval Aviation Enterprise. Reputations are weighed more heavily in the case of research published by authors within the Naval Aviation community, and less so in articles appearing in a scholarly journal, as articles in peer-reviewed journals will have gone through rigorous editing processes.

Lack of bias. Sources cited are reviewed for objectivity on the whole of the article. Persuasive writing is avoided, as are white papers from vendors selling a product or service. For this study, the most questionable sources come from the United States Navy Recruiting Command's website. The Recruiting Command clearly has bias, and in effect, has a product to sell – a career in the United States Navy. This source is valuable for its comparison to the real-world survey research performed in 2014 with members of the Naval Aviation Enterprise, since it illuminates the stark differences in how the Navy presents the aviation community and how the community perceives itself.

Quality. The overall quality of the writing style is an important consideration when evaluating potential sources. The research author must grasp the topic clearly, present the information in a clear and structured manner, use proper punctuation and grammar, and cite sources before drawing conclusions.

Timeliness. Knowledge management is a burgeoning field, and the currency of sources in the subject area is of key importance. Because modern knowledge management is a relatively new concept, articles are limited to a publishing date within the past 10 years to maintain relevance. It is also important to consider that the references list from articles published from 2006-2008 may or may not contain any other usable sources published after 2006. Certain search attempts contributing to this research are limited to only the past 5 years, so that the reference list provides a more viable set of potential resources.

Relevancy. Evaluation the relevancy of sources is accomplished by the use of specific keywords when searching, and judicious use of Boolean search operators. This approach helps to ensure that the keywords either appear, do not appear in cases where the Boolean search operation excludes them, or appear in specific combinations either in the title or the body of the source. Scanning the full article text for the popularity of certain key search terms and phrases helps to determine the benefit of reading the full text and eventually whether the article supports the research questions and should be cited as a source.

Annotated Bibliography

The bibliographic references below are broken into categories. Reference Group 1 contains sources and directives that provide and amplify background information on the Enterprise of Naval Aviation and provide community definitions. Reference Group 2 contains sources on knowledge management unique to military and government organizations. Reference Group 3 contains other sources on knowledge management that are applied to civilian organizations, or are otherwise non-governmental in nature.

Reference Group 1: Background Information on Naval Aviation and Definitions

Babb, C., Ed. (2010, January). *Naval aviation vision*. Retrieved from http://www.public.navy.mil/airfor/Documents/Vision%20Document.pdf

Abstract. Approaching the 2011 centennial review and examination of the United States Naval Air Forces, the Commander of the Naval Air Forces published a look ahead at the aircraft, weapon, and mission systems transitions and the way forward for Naval Aviation until the year 2032. This substantive 125-page document lays out in great detail not only the requirements and programs of record within the Navy, but the need for new innovation in the near future. This spans all facets of all sub-communities and platforms, to include forward sea-basing and ship capabilities that are currently under development or which do not yet have answers.

Summary. This document is a trusted resource within the Naval Aviation Enterprise that provides an exhaustive plan for the future of the Enterprise. The broad definition of mission capabilities for the future is important for this study, as it clearly aligns policy guidance for members of the Enterprise with the priorities of

top-level leadership. The resource provides platform and technology transition plans for support activities and weapon systems alike. Since knowledge management is not directly confronted in the exhaustive 125-page document, its absence can be used within the context of this research study to establish the lack of community investment in proper knowledge management activities and practices. Additionally, the massive temporal scope of this resource, which provides a planning horizon of 22 years forward from its publishing date and 15 years forward from the date of this research study, makes it valuable in establishing the long-term priorities of the Enterprise leadership.

Buss, D. (2013, April). *The Naval Aviation Enterprise Air Plan* (#30). Retrieved from http://www.public.navy.mil/airfor/nae/Air%20Plan/Apr13%20Air%20Plan.pdf

Abstract. The document is a single page and lays out broad policy initiatives. The policy initiatives come from the office of the Commander of the United States Naval Air Forces. Some links to other policy-related documents are presented on the page for further reading. This document is useful in making the necessary comparison between the Commander's strategies and the current shortfalls in the community with respect to knowledge management. *Written by Gabriel Edwards.*

Summary. The Enterprise Air Plan is an abbreviated document that conveys and explains short-term priorities of Enterprise leadership and can be considered, within the context of this research study, as a nominal example of Naval Aviation leadership guidance. Since the document comes from the top-tier leadership within the organization, namely the Commander of the Naval Air Forces, it is reasonable to

grant it an authoritative basis as a research source. By military policy, there are no lower-level resources that are permitted to realign or supersede the strategies outlined in the document, either in the Naval Aviation or Marine Corps Aviation communities. Within the context of this research study, this resource is used to link the great, continuing demand for Naval Air missions, the decline in resource availability, and the absence of knowledge management planning or prioritization information to establish a pattern of deviation from the industry best practices of knowledge management. This document does not provide background information or cite any references, but is a generally bulleted list of leadership priorities.

Fegan, L. M. (2016). *Review of Knowledge Management Strategy, Mission, Functions, and Tasks*. Little Creek, VA.

Abstract. This document is a critical review of the policy put forth in the 2016 document *Naval Special Warfare Knowledge Management Strategy, Mission, Functions, and Tasks.* A number of assets of the policy are reviewed for attainability, practicality and background. Several change recommendations are made for the main document by a Knowledge Manager of the Naval Special Warfare community. This is an unclassified proprietary document. *Written by Gabriel Edwards.*

Summary. This resource is a memo authored by a trusted Naval community agent – the Knowledge Manager of Naval Special Warfare Group Four. He analyzes the strategies, missions, functions and tasks outlined and employed by the document governing Naval Special Warfare knowledge management, and provides recommendations for improvement. Mr. Fegan is a civil service government

employee who has been the sole Knowledge Manager of Naval Special Warfare Group Four since 2006, and had previously managed knowledge as an Officer on active duty in the information professional community of the United States Navy. His expertise is bounded by his professional experiences and opinions within the Naval Special Warfare community, and while current and expansive, may not necessarily be indicative of the practices that may be employed by members of the Naval Aviation Enterprise. His feedback guidance on the knowledge management policies employed by the Naval Special Warfare community writ large however, are used within the context of this research study to qualify the findings on best practices – especially as they may pertain to public-sector and military applications.

Halvorsen, T. (2014, March 7). Department of navy chief information officer - policy: DON KM strategy. Retrieved November 2016, from http://www.doncio.navy.mil/ContentView.aspx?id=4980

Abstract. The purpose of this memo from the Chief Information Officer of the United States Navy is to update and reissue the knowledge management (KM) strategy for the Department of the Navy. This strategy identifies goals and objectives for continued KM implementation in the DON. Though KM is driven by the specific mission requirements and needs of individual commands, it is important to continue to share KM know-how and lessons learned across the Department. In the current fiscally challenging environment, commands should recognize the benefits of KM as an enabler to facilitate mission accomplishment.

Summary. This reference defines, in general terms, the knowledge management

strategies and priorities for the entire Department of the United States Navy. By policy, subordinate agencies are required to formally consider the official guidance, but since there are no official prescriptions for systems or processes, and no fiscal authorizations or methods, it is only pertinent to this study as appropriate professional guidance. This reference is important to this study in its ability to link a Naval organization with an officially sanctioned knowledge management program (Naval Special Warfare, and by extension, Naval Special Warfare Group Four) to other Naval organizations (specifically active duty aviation squadrons) which do not wholly adhere to the guidance of the official policy, promulgated by the Department of the Navy's Chief Information Officer. This source represents official policy, and cites no scholarly references; it is important to this research study only as it serves to explain the priorities of the top tiers of Naval leadership. The fact that there are no specific processes or funding instruments provided in the policy illuminates the lack of leadership investment in knowledge management that exists department-wide.

Naval Special Warfare Knowledge Management Strategy, Mission, Functions, and Tasks, § (2016).

Abstract. The document is 12 pages and lays out KM policy initiatives in the community of Naval Special Warfare. The policy initiatives come from the office of the Commander of the United States Naval Special Warfare Command. Some references to other policy-related documents are presented on the first page for further reading. This is an unclassified proprietary document. *Written by Gabriel Edwards.*

Summary. This unclassified program document comes from the staff of Naval Special Warfare Command, headed by the Commander, Rear Admiral (Upper Half) Timothy Szymanski. The official program instruction is useful to this study in the assessment of its plan for knowledge management, and how it differs from programs and processes that exist among the operational tiers of the Naval Aviation Enterprise. Although this document outlines the knowledge management practices of a separate Naval enterprise, it grants depth to this study on Naval Aviation, and is used to provide a notable and applicable example of a functioning knowledge management plan in the public sector, specifically within the United States Navy. This policy is a good example of implementation of the program guidance provided by the US Navy Chief Information Officer.

Navy Recruiting Command. (2016). Working, roles, & life in a navy squadron: Navy.com. Retrieved November 13, 2016, from Navy.com, https://www.navy.com/navy-life/life-in-a-squadron.html

Description. This source sheds light on the typical life of not only the military member assigned to a squadron in the United States Navy, but as a family member of either a member of the enlisted or officer community. This document is produced and maintained by the *.com*, or the commercial recruiting branch of the United States Navy Recruiting Command. The document is not attributable to a single author, or editorial staff, but rather represents the public presentation as approved by the recruiting arm of the United States Navy. *Written by Gabriel Edwards*

Summary. The information contained on this website is furnished by the United

States Navy's Recruiting Command and is in three categories: *role of a squadron*, *working in a squadron*, and *squadron life*. Each of these functional tabs presents information available for public consumption on most of the facets of the operations of a naval flight squadron. There are no sources cited in this product, which is an obvious tool for recruitment. The website only highlights the most positive elements of Naval Aviation. This resource is valuable to this study in how it compares to the 2014 retention study and associated white paper authored by Commander Snodgrass, published by the United States Naval Institute. This page of the website hosted by the Navy Recruiting Command touts a wholly unrealistic perspective on Navy squadron life, especially when compared to the 2014 retention study. This contrast is used within the context of this study to shed light on an existing personnel retention problem, and how that retention problem may further the existing informational and knowledge management inconsistencies and deficiencies across the Naval Aviation Enterprise.

Snodgrass, G. (2014, March 20). Keep a weather eye on the horizon: A navy officer retention study. Retrieved November 2, 2016, from United States Naval Institute.

Abstract. The U.S. Navy is about to face its most challenging officer retention problem in more than two decades. Pivotal factors include continued high operational tempo after a decade of unusually long deployments, loss of "combat" mentality, plummeting morale and esprit de corps, significantly improved economic trend lines, perception that operational command is not valued, outflow of Boomers from workflow and influx of Millennials, and erosion of trust in senior leadership. This study takes an in-depth look at factors significantly impacting officer retention,

compares them with historic retention downturns, evaluates Fortune 500 approaches for retaining talent, and provides actionable recommendations to enable us to outrun the approaching storm.

Summary. This professional research study published by the United States Naval Institute is a valuable resource in explaining the key elements behind an officer retention problem that is peculiar to the Naval Aviation Enterprise. Commander Guy Snodgrass authors the paper in his official capacity as the prospective Commanding Officer of Strike Fighter Squadron 195, a United States Navy squadron of F/A-18 Hornet aircraft, aircrew and support staff. Commander Snodgrass is granted access to the highest echelons of Naval Aviation leadership for his clearance to conduct the study. He uses a formal survey-based research methodology, which includes participation by a majority of the members of the Enterprise. His formal original research cites few sources, but has been internally regarded by the top tiers of Navy leadership as a cornerstone of retention strategy.

Within the context of this research study, his results are used in synthesis with other sources to explain the nature of a retention problem facing the Enterprise of Naval Aviation, and how that specific retention problem may fuel specific shortfalls in appropriate knowledge management strategies employed elsewhere in both the public and private information sectors. The research performed by Commander Snodgrass is granted much professional credit within the community, and thus is granted serious credibility within this research study.

Reference Group 2: Knowledge Management in the Public Sector

Bartczak, S. E., Turner, J. M., & England, E. C. (2008). Challenges in developing a knowledge management strategy. *International Journal of Knowledge Management*, *4*(1), 46–50. doi:10.4018/jkm.2008010104

Abstract. It is widely acknowledged that knowledge management (KM) strategy is a desired precursor to developing specific KM initiatives. Strategy development is often difficult due a variety of influences and constraints. Using KM influences as a foundation, this case study describes issues involved in developing a KM strategy for the Air Force Material Command, including issues to be considered for future strategy development such as leadership support and understanding, conflicts with IT organizations, funding, technology usage and configuration, and outsourcing.

Summary. This scholarly journal article involves research conducted on the United States Air Force Material Command (AFMC). The article probes the Command in its employment of knowledge management practices, and illuminates the challenges and successes of the program that they employ. The researchers conducted original research on the AFMC organization; results are presented with a discussion on the specific elements of the organization, which are very similar in both size and scope to the Naval Aviation Enterprise. This article provides specific links to the challenges that are faced within the Navy. Within the context of this research study, this source is used to define the key elements in the implementation of a holistic knowledge management strategy within a military organization. Since the article also provides documentation of shortfalls and other resourcing challenges within a military

organization, consideration is given to how those may affect the Enterprise.

Edwards, J. S., & Taborda, E. R. (2016). Using knowledge management to give context to Analytics and big data and reduce strategic risk. *Procedia Computer Science*, *99*, 36–49. doi: 10.1016/j.procs.2016.09.099

Abstract. At the moment, the phrases "big data" and "analytics" are often being used as if they were magic incantations that will solve all an organization's problems at a stroke. The reality is that data on its own, even with the application of analytics, will not solve any problems. The resources that analytics and big data can consume represent a significant strategic risk if applied ineffectively. Any analysis of data needs to be guided, and to lead to action. So while analytics may lead to knowledge and intelligence (in the military sense of that term), it also needs the input of knowledge and intelligence (in the human sense of that term). And somebody then has to do something new or different as a result of the new insights, or it won't have been done to any purpose.

Summary. This scholarly resource seeks to establish how strategic risk and data analysis are connected by knowledge management. The authors performed a study on independent governmental agencies within Canada. This resource explains the connection of strategic risk, data analysis, and knowledge management, and how these key organizational processes all correlate with calculated organizational efficiency ratings. Throughout the article, the authors stress the use of organizational data, however large, as a tactical organizational asset. They note that the use of data as an asset in combination with an effective analysis strategy is

proven to increase organizational learning.

Though this study examines broad practices and strategies of government agencies within Canada and in an unrelated industry, the findings on efficiency are useful to this study. Within the context of this research study, the findings from this scholarly journal article are used in synthesis with other Navy-specific sources to establish the potential benefits of knowledge management best practice implementation toward both reducing strategic risk and increasing the operational efficiency of the Naval Aviation Enterprise.

King, W., & Marks Jr., P. (2008). Motivating knowledge sharing through a knowledge management system. *Omega*, *36*(1), 131–146. doi: 10.1016/j.omega.2005.10.006

Abstract. Based on both economic and sociological theory, the effects of supervisory control and organizational support on the frequency and effort of individuals in contributing their personally held valuable knowledge to a "best practices-lessons learned repository-based" knowledge management system (KMS) were compared. Supervisory control, as expected, had significant impact on frequency, but it also had unexpectedly significant influence on effort. When system variables-usefulness and ease of use-were controlled for, the organizational support measure had little effect on either outcome. These results provide greater support for economic-agency-theory motivators of knowledge sharing and lesser support for organizational support motivators than has been previously believed. They also emphasize the important impact of systems variables in motivating KMS use. Since the study was conducted in a government (joint civilian-military) organization. The organizational

type may significantly influence the results.

Summary. This scholarly journal article consists of a description of an experimental survey performed on members of an unnamed large force element of the United States Department of Defense. The researchers in the study use a newly minted knowledge management system, dubbed *SYSTEM X*, with control and experimental survey cycles to establish a trend of positive organizational learning. Though the researchers caveat their findings by explaining that results are likely to vary throughout various industries and organizations, the application of the globally distributed sample population has direct and viable application to the Naval Aviation Enterprise, which operates bases located around the world. The composition of the participants surveyed by the study closely mirrors some small elements of the Enterprise, specifically the size and relative complexity of a squadron element, which renders the findings more applicable.

The article presents a detailed analysis of the social factors that contribute to the success and failure of knowledge management systems and processes. Within this research study, the journal article is used to establish a baseline of social factors and precepts that would likely ground the development and deployment of a knowledge management system within the Naval Aviation Enterprise. This resource is less current (2008) than some others used within this study, but because it explores social constructs and behavior analysis much more heavily than technical systems, the lack of currency is of relatively little concern.

Knox, J. (2012). Stop reinventing the wheel: Knowledge management in the United States

Navy. *CHIPS Magazine*. Retrieved from http://www.doncio.navy.mil/CHIPS/ArticleDetails.aspx?ID=4206

Abstract. In today's complex operating environment, a knowledge advantage is a key to effective performance. However, due to information overload and an inability to tap into knowledge generated by others, we often "re-invent the wheel" instead of building on knowledge that already exists within the departments of the Navy and Defense. How can we capture the richness of that knowledge and reduce the cycle time needed to make decisions and complete actions — by employing the principles of knowledge management.

Summary. The Chief Information Officer of the United States Navy operates a publication called *CHIPS*, both in print and online. This publication serves information professionals of the U.S. Navy in the performance of their official duties by presenting information topics for expansion by recognized community experts. Articles in this publication rarely cite any sources formally, but instead rely on the subject matter expertise of the author. Clearly evident through this article, this publication appears to be something of an echo chamber, used to rephrase, explain, and conflate official policies promulgated by both the Department of the Navy and the office of the Chief Information Officer. Though this article is obviously a tool used to aid in the implementation of official policy, it is used within the context of this research study to present the expert opinion of a recognized and trusted community agent, namely the Director of Information and Knowledge Management for the Department of the Navy Chief Information Officer. The most valuable element of this paper exists in the presentation of additional references, other

experts, and a checklist for the implementation of a right-sized knowledge management program.

Peck, E., Kemmet, L., McGowan, R., Hodgin, C. R., & Peintner, B. (2012). The agility imperative: Emerging knowledge management requirements for stability operations in the U.S. Army. *Innovations: Technology, Governance, Globalization*, *7*(1), 91–106. doi:10.1162/inov_a_00118

Description. This article was co-authored by professional military officers who make the case for large scale knowledge management modernization in the U.S. Army's stability efforts in the Middle East. There is a high level of detail in the solutions, assets, and methods that are proposed in the article. Though some of the text pertains only to missions and situations unique to the US Army, much of the article's concepts may be applied to the Navy, to aviation, or to DoD writ large. *Written by Gabriel Edwards.*

Summary. This article is co-authored by three military and government information professionals within the U.S. Army and its subordinate activities, and by two members of the civilian information sector. Though it is a white paper or case study by form, and has not undergone the regular peer-review process required of journal-published articles, it is authored by recognized community experts and provides an in-depth examination of the information factors influencing tactical Army field units across a number of different specifications. This article does not cite references, but rather relies heavily on the expertise and experience of the several co-authors. The most notable aspect of the white paper involves the

examination of the many challenges the U.S. Army has faced in conflict against a disaggregated and insurgent enemy for the past decade, and how this new style of conflict drives the need for a decentralized, agile, and ad-hoc solution for the management of battlefield information. This article is used in synthesis with other resources of this research study to explain not only the need for a knowledge management system, but also the need for the solution to be agile and collaborative, especially with respect to complex missions and austere or hostile environments.

Reference Group 3: Knowledge Management in the Private Sector

Duffield, S., & Whitty, S. J. (2015). Developing a systemic lessons learned knowledge model for organizational learning through projects. *International Journal of Project Management*, *33*(2), 311–324. doi: 10.1016/j.ijproman.2014.07.004

Abstract. A significant challenge for government and business project organizations is to ensure that lessons are learned and that mistakes of the past are not repeated. Both knowledge and project management literature suggests that in practice lessons learned processes rarely happen, and when it does it is concerned with lessons identification rather than organisational learning. There are limited practical models for general management to use to conceptualize what organisational learning is and therefore how to enable it. However, aspects of health care, nuclear power, rail, and aviation organizations have successfully implemented organisational learning by way of the Swiss cheese model for safety and systemic failures. This paper proposes an adaptation of the Swiss cheese model to enable project organizations to conceptualize how they learn from past project experiences

and distribute successful project know-how across an organisational network of elements such as individual learning, culture, social, technology, process and infrastructure.

Summary. This source appears in a professional peer-reviewed journal, the *International Journal of Project Management*. Not only do the authors directly confront the problem of organizational learning, but they also seek to explain the contradiction of multiple published paradigms concerning the best practices of organizational learning and knowledge management. The researchers pose the idea that there is a trend toward failing to learn lessons from the projects of the constituents of an organization, but that there is also no evident shortage of published specific ideas and concepts on knowledge management. According to the 2015 research, there are a multitude of ideas and concepts that lend expertise to the practice of knowledge management, but there are relatively few, if any, explicit processes and systems that can be applied to any of the sectors the researchers mention.

This resource is very current – published in 2015 – and thus is very applicable in the study of best practices. Since the authors directly studied government agencies in one part of their research, their findings are reliable in the context of this research. The unique element of this article is the examination of the challenges faced by organizations with multiple poorly developed or broken knowledge management systems, a problem that affects the Naval Aviation Enterprise. This research source can be used in synthesis with other sources to illustrate the challenges presented by multiple nonstandard solutions that are presented in literature for many of the

known knowledge management deficiencies.

Pirró, G., Mastroianni, C., & Talia, D. (2010). A framework for distributed knowledge management: Design and implementation. *Future Generation Computer Systems*, *26*(1), 38–49. doi: 10.1016/j.future.2009.06.004

Abstract. This paper describes a framework for implementing distributed ontology-based knowledge management systems (DOKMS). The framework, in particular, focuses on knowledge management within organizations. It investigates the functional requirements to enable Individual Knowledge Workers (IKWs) and distributed communities (e.g., project teams) to create, manage and share knowledge with the support of ontologies. On the one hand, the framework enables distributed and collaborative work by relying on a P2P virtual office model. On the other hand, it provides a multi-layer ontology framework to enable semantics-driven knowledge processing. The ontology framework allows organizational knowledge to be modeled at different levels. An Upper Ontology is exploited to establish a common organizational knowledge background. A set of Workspace Ontologies can be designed to manage, share and search knowledge within communities by the establishment of a contextual (i.e., related to the aim of a group) understanding. Finally, Personal Ontologies support IKWs in personal knowledge management activities. We present an implementation of the designed framework in the K-link+ system and show the suitability of this approach through a use case. The evaluation of K-link+ in a real network is also discussed.

Summary. This resource is valuable in its explanations of an implementation plan

for a multi-faceted knowledge management system. The resource appears in a peer-reviewed journal and is general enough that it does not directly involve any specific business sector. From low level implementation through the top tiers of an organization, this source represents the mechanics of each ontology that should be considered. Within the context of this research, this source is used in the establishment of candidate concepts of top-down, management-scalable solutions for knowledge management. The research was published in 2010, and though relatively current, the semantics and business analytics measures employed have changed and improved substantially, vis-à-vis Zoho and ThinkFree; thus, some of the specifics of the systems proposed by the researchers are to be carefully considered, and due regard is given to the fact that they may be slightly outdated.

Zheng, W., Yang, B., & McLean, G. (2009). Linking organizational culture, structure, strategy, and organizational effectiveness: Mediating role of knowledge management. *Journal of Business Research*, *63*, 763–771. doi: 10.1016/j.jbusres.2009.06.005

Abstract. Practices of knowledge management are context-specific and they can influence organizational effectiveness. This study examines the possible mediating role of knowledge management in the relationship between organizational culture, structure, strategy, and organizational effectiveness. A survey was conducted of 301 organizations. The results suggest that knowledge management fully mediates the impact of organizational culture on organizational effectiveness, and partially mediates the impact of organizational structure and strategy on organizational effectiveness. The findings carry theoretical implications for knowledge

management literature as they extend the scope of research on knowledge management from examining a set of independent management practices to examining a system-wide mechanism that connects internal resources and competitive advantage.

Summary. This peer-reviewed journal article includes original research conducted via survey on a large number of organizations. The researchers' main effort involves tying the variables affecting organizational effectiveness, strategy, culture, and structure to knowledge management strategy. Although this article does not directly pertain to organizations in the government or defense sectors, it is directly applicable to this research study in how it examines the retention of human resources and the knowledge that they accumulate. The article was published in 2009, but since it addresses knowledge management only as a more general concept while focusing more thoroughly on organizational culture, it is very relevant to this research study. The results that the researchers cite in the article can be used in synthesis with the 2014 retention study by Commander Snodgrass to clarify and emphasize the resource shortages that plague the Naval Aviation Enterprise and the resulting impacts to accumulated organizational knowledge.

Conclusion

This research study presents the knowledge management policies, programs, and practices of multiple communities within the United States Navy and pairs them with a robust examination of the best practices by both the public and private sector. These three elements are tied together in this research in order to isolate specific, actionable opportunities for improvement of knowledge management practices within the Naval Aviation Enterprise. The body of literature in this study describes knowledge management benefits and common implementation pitfalls alike. These research results, when combined with the existing body of military studies, program documents, instructions, and regulations, help to form the basis of an implementation plan for a compliant knowledge management solution for the Naval Aviation Enterprise. The results that follow are not intended to be all-encompassing solutions; rather, they are a presentation of the key knowledge management deficiencies within the Enterprise and potential improvements identified in the literature.

Resource Availability

The bulk of literature evaluated during the course of this research points in the same direction: meaningful and sustainable knowledge management solutions require the commitment of both human and fiscal organizational resources (Bartczak, Turner & England, 2008; Duffield & Whitty, 2015; Edwards & Taborda, 2016; Halvorsen, 2014; King & Marks, 2008; Knox, 2012; "Naval Special Warfare Knowledge Management Strategy," 2016; Peck, Kemmet, McGowan, Hodgin & Peintner, 2012; Pirró, Mastroianni & Talia, 2010). Though excess resources within the Navy are scarce, there is an established need for a solid commitment promoting the positive management of organizational knowledge

(Halvorsen, 2014; Snodgrass, 2014). The low availability of human resources, specifically those of aviation officers and pilots, has been noted by Snodgrass (2014) and underscores the need for human continuity in knowledge management.

Officer Career Trajectory and Retention

The findings in Commander Snodgrass' 2014 manpower and retention study on the Naval Aviation Enterprise and the findings of King and Marks' 2008 study on social climates and knowledge sharing principles clearly indicate that the current retention crisis for Naval Officers, specifically within Naval Aviation, is not only misaligned with the best trends and practices in the knowledge management field, but is likely to accelerate the degradation of a system already in decline.

The constant stream of aviators who arrive, train at, deploy with, and depart from a squadron on relatively short timelines – three years or less on average – are not well equipped to manage organizational knowledge or build a body of organic information resources (Snodgrass, 2014). The progression of the careers of Naval aviators and officers within the Navy writ large is unlikely to change dramatically, even in the long term (Snodgrass, 2014). Without permanently assigned personnel to manage the body of knowledge that a squadron should accumulate and without a modern system to manage, maintain, and redistribute information from the organization's body of knowledge, it is reasonable to expect the manning crisis and the morale problem on the part of squadron aviators to continue or deepen (King & Marks, 2008; Snodgrass, 2014). The source of the disparity between the image of Naval Aviation portrayed by the Navy Recruiting Command (2016) and the attitudes described in Snodgrass' 2014 retention study is likely partly

responsible for the human resource crisis currently evident throughout the Enterprise.

Private Sector Knowledge Management Literature and Recommendations

There are three main elements to successful knowledge management strategies and systems that are evident in the literature on private sector practices that can be gleaned for recommendations for the Naval Aviation Enterprise. First, King and Marks (2008) emphasize the crucial importance of organizational climate and participant attitudes with respect to knowledge sharing and organizational effectiveness. The cultivation of an organizational climate of open knowledge sharing, coupled with the empowerment of people to share ideas through the proper tools and strategy, have been shown to have a net positive effect not only on the participant attitudes within an organization, but on organizational effectiveness itself (Zheng, Yang & McLean, 2009). From Snodgrass' 2014 original research on the enterprise, it is evident that there is a rather serious morale problem plaguing the ranks of aviators that populate active duty squadrons, but according to King and Marks (2008), organizational social attitudes should trend positively after the implementation of a worthy knowledge management program.

Second, there must be a functioning system or platform that makes knowledge sharing not only possible, but encourages the free flow of information (Pirró, Mastroianni & Talia, 2010). Since Naval air missions are commonly dynamic and complex, the highest priority of a knowledge management program is the distillation of specific mission information, which may be redistributed appropriately when needed (Babb, 2010; Buss, 2013; Edwards & Taborda, 2016).

Finally, Duffield and Whitty (2015) explain the need for responsible management of

any system that an organization chooses to field – otherwise resources are wasted. A knowledge manager is not only utilized as a custodian for a knowledge management system, but is also useful for promoting the actual sharing of knowledge (Naval Special Warfare Knowledge Management Strategy, 2016). Navy squadrons do not resource a billet for a long-term knowledge manager at present (Babb, 2010; Knox, 2012). In order to prevent the Naval Aviation Enterprise from "re-inventing the wheel," (Knox, 2012, p.1) and to positively align with the best practices of the most successful organizations in the private sector, resourcing a knowledge manager position, and deploying a knowledge management system are two top priorities for the key stakeholders of the Enterprise.

Public Sector Knowledge Management Literature and Recommendations

Similar to the research findings from the private sector, the public sector findings tout the capabilities of properly developed and mature knowledge management programs (Bartczak, Turner & England, 2008; Edwards & Taborda, 2016; King & Marks, 2008; Knox, 2012; Peck, Kemmet, McGowan, Hodgin & Peintner, 2012). The key element present in all of the public sector resources examined for this study center on the need to implement a knowledge management strategy. Whether for a large-force, non-combat military element like the Air Force Material Command, or for a combat-deployed U.S. Army unit for battlefield knowledge management, the implementation plan must be well resourced and critically examined, and the system or program must be deployed steadily and in phases (Bartczak et al., 2008; Peck et al., 2012). Any flaws in the deployment or resourcing plan could lead to outright failure of the knowledge management system and program, resulting in inevitable ungainliness that will cause potential participants to opt for other solutions (Bartczak et al., 2008). Until the risk of the current resourcing shortages can be mitigated,

large-scale implementation of a knowledge management program is not advisable (King & Marks, 2008; Snodgrass, 2014).

Military Knowledge Management Literature and Recommendations

Bounded by the official guidance provided by the Department of the Navy Chief Information Officer, the literature reflects, nearly universally, that where knowledge management solutions are in place and effective, organizational effectiveness thrives (Fegan, 2016; Halvorsen, 2014; Knox, 2012; Naval Special Warfare Knowledge Management Strategy, 2016). In his 2012 article, James Knox praises the successes of the knowledge management strategies in use by several Navy units, specifically commending Naval Special Warfare Command and its subordinates for the effective knowledge management processes they employ.

Interestingly, in any of the other larger Navy sources cited, particularly the 2010 Naval Aviation Vision, knowledge management is completely unregarded. Although this publication is regarded throughout the Enterprise as the sole source for guidance on the future policies of the U.S. Naval Aviation Enterprise, its complete lack of discussion of the mission planning, briefing, execution and debriefing cycle as it pertains to knowledge management is telling. Conceptualization and deployment of a holistic knowledge management strategy is very likely to protect and indeed further the operational mission relevance of Naval air assets through the establishment of a viable organizational learning process.

Summary

Effective management of knowledge not only results in the prudent use of government allocated resources, but is also the surest way to reinvest in both the morale of the personnel and the overall mission effectiveness of squadron-level assets (Duffield & Whitty, 2015; Naval Special Warfare Knowledge Management Strategy, 2016; Snodgrass, 2014; Zheng, Yang & McLean, 2009). Since sources in both the public and private sectors indicate that knowledge management solutions increase organizational effectiveness, and sources internal to the U.S. Navy indicate the same, the key stakeholders within the Naval Aviation Enterprise should begin immediately with the development and implementation of a comprehensive knowledge management strategy (Duffield & Whitty, 2015; Halvorsen, 2014; King & Marks, 2008; Knox, 2012; Peck et al., 2012). The organizational knowledge earned over years of combat and high-risk flying has real value to the Enterprise, and should be preserved, protected, and passed down to future generations of Naval Aviators (Snodgrass, 2014). Failure to develop and implement a strategy could have very detrimental effects on a number of issues within the Enterprise – retention, credibility, and mission applicability (Halvorsen, 2014; Knox, 2012; Peck et al., 2012; Snodgrass, 2014; Zheng, Yang & McLean, 2009).

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