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Summer E. Bartczak  
sbartczak@uca.edu

Aaron M. Blair

Todd A. Peachey

Jason M. Turner

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# KM Capability Assessment: A Qualitative Approach

**Summer E. Bartczak**

University of Central Arkansas  
sbartczak@uca.edu

**Aaron M. Blair**

Air Force Pentagon AF/A2RN  
aaron.blair@pentagon.af.mil

**Todd A. Peachey**

Air Force Institute of Technology  
todd.peachey@afit.edu

**Jason M. Turner**

Air Force Institute of Technology  
Jason.turner@afit.edu

## ABSTRACT

The knowledge management (KM) literature highlights both the desire of organizations to assess KM capability and the need to create better methodologies and tools to do so. Although some progress has been made in developing valid assessment tools, the topic still remains inadequately explored. Answering a call for the exploration of KM capability maturity assessment across a variety of organizations (Kulkarni & St Louis, 2003), this research uses the Knowledge Management Capability Assessment (KMCA) methodology (Kulkarni & Freeze, 2004) and Freeze & Kulkarni (2005; 2006) as a guiding framework to qualitatively assess the KM capability of the Secretary of the Air Force Financial Management and Comptroller (SAF/FM) organization—a military organization recognized for exceptional KM efforts. The research resulted in rich, contextual findings with regard to the specific KM efforts underway within SAF/FM. Interestingly, the nature of these efforts translated into KM capability levels lower than expected; however, precise areas for improvement were identified.

## Keywords

Knowledge management (KM), KM maturity, KM capability, KM assessment, KM capability maturity, case study

## INTRODUCTION

The US military services have increasingly recognized the importance of knowledge as a critical resource. As such, each of the military services have put into place KM programs to varying degrees. Although the implementation of KM in the Air Force has been progressing at an overall slow pace (Bartczak, 2002; Sasser, 2004), one organization, Secretary of the Air Force Financial Management and Comptroller (SAF/FM), is continually recognized as a leader in KM. SAF/FM finds it difficult, however, to assess the maturity and effectiveness of its KM efforts. Answering the call by Kulkarni & St. Louis (2003), Freeze & Kulkarni (2004), Berztiss (2002), and others to explore KM assessment across a variety of organizations, this research explored the topic in a military (AF) organization context. By turning, specifically, to the KM maturity assessment work by Kulkarni & St Louis (2003) and the KM capabilities assessment (KMCA) work by Kulkarni & Freeze (2004) & Freeze & Kulkarni (2005; 2006), the objective of the larger research effort was to provide a KM capabilities assessment for a presumably KM-mature organization, albeit using a qualitative application of the KMCA instrument. This paper highlights the findings as guided by the following research questions:

- #1--How does a presumably KM-mature organization operationalize its KM efforts?
- #2--How do the results from research question #1 translate into KM capability levels?

## LITERATURE REVIEW

As a critical resource, knowledge demands good management (Holsapple & Joshi, 2001). "Measurement of organizational knowledge assets and their associated knowledge processes is necessary to determine the effectiveness of knowledge management initiatives" (Freeze & Kulkarni, 2005, pg. 1). By assessing the knowledge capabilities of the organization and by advancing to higher maturity levels, an organization can fulfill its purposes much more efficiently (Berztiss, 2002). Several practitioners and academics have attempted to translate KM capability maturity using the well-established Capability Maturity Model for software as a foundation (Berztiss, 2002; Harigopal, 2001; Ehms & Langen, 2002; Hung & Chou, 2005). These KM maturity models, however, while contributing knowledge towards a practical maturity model for KM, have lacked real-world application (Kulkarni & St. Louis, 2003). More specifically, the models have lacked detailed description, operational classification of different types of knowledge, and definitions of levels in terms of goals and validation (Kulkarni & St. Louis, 2003; Kulkarni & Freeze, 2004 & 2006). Additional models, based on empirical data, for measuring the KM capability of an organization include those by Gold, Malhotra, & Segars (2001), Freeze & Kulkarni (2005), and Kulkarni & Freeze (2006). Unlike Gold et al. (2001) who defined a

KM capability framework comprised of two constructs--knowledge infrastructure capability and knowledge process capability--Kulkarni & Freeze (2004) and Freeze & Kulkarni (2005; 2006) present a framework that focuses on the distinct specialization of the knowledge life cycle across knowledge themes while viewing technology and culture as embedded enablers of the knowledge processes. Specifically, the Kulkarni and Freeze knowledge management capability assessment (KMCA) allows the ability to identify “separate knowledge capabilities that may be individually measured and leveraged within a single organization to more effectively meet...objectives” (Freeze & Kulkarni, 2005, pg. 1).

**Knowledge Management Capability Assessment**

The Knowledge Management Capabilities Assessment (KMCA), developed over time by Kulkarni and St. Louis (2003) and Kulkarni & Freeze (2004) and Freeze & Kulkarni (2005; 2006), provides a methodology and a validated, empirically-tested survey instrument for organizational self-assessment of KM capability. The survey instrument consists of 128 scale items grouped by four knowledge themes and knowledge-sharing culture (the latter is not addressed in this paper due to space). Each knowledge theme (*expertise, lessons learned, knowledge documents, and data*) also has a distinct representation of the various processes of the knowledge life cycle which includes *acquire, store, present, and apply*. Each of the survey instrument questions corresponds to a capability level for a specific knowledge theme/knowledge life cycle process. The capability levels and associated general goals for each level of the KMCA are listed below in Table 1. Table 2 shows a summary of the knowledge processes as they intersect with the knowledge themes (accompanied by examples of technology enablement).

Capability Level	Behavior Goals	Infrastructure Goals
Level 1: Possible	- Knowledge sharing is not discouraged - There is a general willingness to share	- Knowledge assets are recognized/identified
Level 2: Encouraged	- Organization's culture encourages/rewards all activities w/respect to sharing of knowledge assets - Ldrshp communicates commitment to knowledge sharing	- Explicit knowledge assets are stored in some fashion - Tacit and implicit knowledge is tracked
Level 3: Enabled/Practiced	- Sharing of knowledge assets is practiced - Leadership/senior management sets goals with respect to knowledge sharing - KM related activities are a part of normal workflow	- KM systems/tools and mechanisms enable activities with respect to knowledge sharing - Repositories/knowledge taxonomies exist
Level 4: Managed	- Employees find it easy to share knowledge assets - Knowledge sharing is formally/informally monitored/measured	- Training /instruction/tools available for KM system usage - Change management principles are used to introduce KM practices
Level 5: Continuously Improved	- Mechanism and tools to leverage knowledge assets are widely accepted - There is a systematic effort to measure and improve knowledge sharing	- Business processes /tools/mechanisms that support sharing of knowledge assets are periodically reviewed/improved

**Table 1. KM Capability Levels with Associated General Goals (adapted from Kulkarni & Freeze, 2004)**

Capability	Knowledge Process				Technological Enablement
	Acquire	Store	Present	Apply	
Expertise	Registering contact and domain expertise	Corporate "directory" of expertise ("yellow pages")	Multiple contact avenues along business needs for various expertise areas	Initiating contact, facilitations of knowledge exchange for issue resolution/learning	Registration tools Expertise search mechanisms Collaboration tools
Lessons Learned	Periodic activities designed to capture relevant successful and failed experiences	Repository of internal best practices, solutions to known problems	Multiple avenues for access of relevant lessons	Reviewing of prior best practices or focused solving of a specific problem	Tools to elicit and capture lesson learned Combination of search and collaboration tools
Knowledge Documents	Accumulation from internal and external sources	Knowledge Bases of documents in text and rich formats	Categorization schemes in order to support the workers mental models	Searching and retrieving of relevant documents	Sophisticated search tools (keyword, Q&A, intelligent context specific, semantic)
Data	Automated data accumulation into data warehouse	Aggregated data structures for quick retrieval in various DW cubes	Pre-calculated queries and accurate, timely and relevant DW reports, OLAP facility	Effective data-driven decision-making support via analytical and graphical tools	Data warehouse, data marts Querying/reporting, OLAP tools DSS tools and interfaces Data mining and statistical analysis tools

**Table 2. Summary of Knowledge Themes (Freeze & Kulkarni, 2006)**

## SAF/FM Knowledge Management Program

SAF/FM is an organization that provides financial guidance to Air Force decision makers as well as provides customer-focused financial services to the Air Force. In 2002, SAF/FM embarked on a KM initiative. The goal for the first phase of KM effort was to develop a KM system. Instead of developing a new system, the existing Air Force Knowledge Now (AFKN) portal was used (Laufersweiler & Sargent, 2003). The AFKN portal is a web-based KM system that centers around a community of practice (CoP) methodology which facilitates collaboration across a dispersed workforce. Thus, all CoP workspace features are geared towards enabling teamwork, communication, and sharing within a virtual environment (Laufersweiler & Sargent, 2003). Initially, the KM tools available on the AFKN portal included a powerful Verity® search engine, “Wisdom Exchange” for posting hints/advice/expertise, discussion forums, and a document management system to name a few. SAF/FM also hired a CKO to lead its KM initiatives and to cultivate a knowledge-sharing culture. At the time of this research, the focus of SAF/FM’s KM program was primarily on explicit knowledge capture and transfer via 330+ CoPs to the extent it could be facilitated by the AFKN KM system.

## METHODOLOGY

In accordance with Yin (2003), this research used a single, explanatory case study design. A case study approach allowed a qualitative application of the KMCA where administering the KMCA survey instrument was deemed inappropriate due to sample size limitations. Data collection was accomplished using a variety of methods and sources to include documentation obtained from the SAF/FM KM system, researchers’ observations of the SAF/FM KM system website content/tools, and through in-depth interviews with nine, key SAF/FM knowledge workers. The final interview protocol consisted of 22 open-ended questions. It should be noted, however, that instead of directly translating interview questions from the KMCA survey instrument, the final interview questions were derived from the definitions and descriptions of the desired end-state conditions required for each knowledge theme (*expertise, lessons learned, knowledge documents, and data*) across each process of the knowledge life cycle (*acquire, store, present, apply*) as identified by Kulkarni & Freeze (2005; 2006) and Freeze & Kulkarni (2006). The qualitative version of the KMCA interview protocol was sent to Kulkarni & Freeze for comments, validation of content, and refinement prior to conducting the interviews. Analysis of the data obtained from the interviews and a review of KM system components, as well as, other KM-related documentation was accomplished using Yin’s (2003) pattern-matching procedures. Relative to research question #1, obtained data was matched against the associated activities and descriptions of the knowledge processes within each of the four knowledge themes (Table 2). Relative to research question #2, data identified as operational activities of SAF/FM’s KM program was matched against KMCA capability level goals (Table 1) for each knowledge theme. Requirements for scoring the capability levels of each knowledge theme was provided by Kulkarni and Freeze and are the same scoring criteria used for the KMCA survey instrument. (*The full scoring legend for each knowledge theme was not included due to space limitations but can be provided upon request*). Research design quality, construct validity, internal validity, external validity, and reliability were all addressed in accordance with Yin (2003).

## RESULTS

### Research question #1: How does a presumably-KM mature AF organization operationalize its KM efforts?

#### Knowledge Theme – Expertise

##### *Acquire (Expertise)*

The acquire process with regard to expertise is about documenting the domain (subject matter) expertise and contact information of experts into a standard profiling scheme (Freeze & Kulkarni, 2006). Respondents indicated that there was no formal mechanism in place to document or organize domain expertise; however, most of the respondents identified the main ‘Wisdom Exchange’ feature of the SAF/FM KM system or their localized version of ‘Wisdom Exchange’ (specific to a CoP) as a means of documenting expertise. An interview subject stated, “I mean, there’s no real validation process, like I said I consider myself an expert in budget and policy, so I just went and signed up.” Some knowledge worker respondents could not identify a process to identify expertise at all.

##### *Store (Expertise)*

The store process with regard to expertise may take the form of a “yellow pages” or a directory that stores contact and relevant subject matter expertise information (Freeze & Kulkarni, 2006). Respondents indicated that there was no central repository or directory of experts, however, such expertise was stored informally. Responses ranged from using the various CoPs as a directory of experts to using the traditional functional hierarchy of the organization as an indirect directory of experts. One interview subject stated, “you’ve got all the communities of practice there [in the SAF/FM KM system] listed categorically and that’s really how you would get to domain expertise.”

*Present (Expertise)*

The present process with regard to expertise is where the knowledge workers are able to identify the right experts for their knowledge needs as well as providing social interactions for experts to exchange tacit knowledge (Freeze & Kulkarni, 2006). The lack of a central repository or “yellow pages” of experts within the SAF/FM KM system corresponded with problems in the ability to search and find expertise. Such problems were evident in the various search methods identified by the knowledge workers.

*Apply (Expertise)*

The apply process with regard to expertise occurs through the social interaction of experts resulting in the resolution of the issue that prompted the interaction (Freeze & Kulkarni, 2006). Overall, responses indicated that interacting with other experts was done on an “as needed” basis but not always with the help of the KM system. One person stated, “I worked on the FM web-based training guides, so, [I consulted with SMEs] on a daily basis. I [received] help to get [the training guides] developed by SME support, but I developed my own SME list for our sub team.”

## Knowledge Theme – Lessons Learned

*Acquire (Lessons Learned)*

The acquire process with regard to lessons learned deals with the ability of the organization to capture relevant successful and failed experiences (Freeze & Kulkarni, 2006). Respondents indicated a formal process was not in place to capture lessons learned. The KM system was used to capture lessons learned but with limited success; one interview subject stated, “We don't have something that says 'lessons learned' that you can click on. It's more done, I think, on an individual CoP basis.”

*Store (Lessons Learned)*

The store process with regard to lessons learned is about making knowledge persistent throughout the organization and is usually found in the form of an electronic repository (Freeze & Kulkarni, 2006). The SAF/FM KM system does not have a main repository for storing lessons learned. Again, responses indicated that lessons learned are stored informally on shared drives within the organization and disparately throughout CoPs on the SAF/FM KM system. One interview subject mentioned, “We have a CoP of our own...we post things, tons of things there, including weekly activity reports...we might want to create a lesson learned folder.”

*Present (Lessons Learned)*

The present process with regard to lessons learned is about making lessons learned available and accessible to the knowledge worker in the form needed (Freeze & Kulkarni, 2006). Without a main repository for lessons learned, the availability and accessibility of lessons learned within the SAF/FM KM program is hit or miss. The majority of the knowledge workers interviewed agreed that trying to find lessons learned is often difficult. One respondent stated, “You could go to the raw files, but they're poorly organized at this point....”

*Apply (Lessons Learned)*

The apply process with regard to lessons learned is about them being used for value-producing action (Freeze & Kulkarni, 2006). The interview questionnaire addressed this by having the interviewees “provide an example of how using lessons learned helped you complete an important task.” Overall, the responses indicated that they were applying lessons learned when they could locate them to help them accomplish their tasks more efficiently.

## Knowledge Theme – Data

Responses indicated that SAF/FM KM does not handle the responsibility of data management itself. As one interview respondent stated, “There's a very clear line drawn from the leadership in terms of where data lies. We should be linking to it and providing folks a means to find our data, but we're not storing it.” All aspects of (fiscal) data management for SAF/FM are under the responsibility of the IT organization, SAF/XC, Warfighter Integration. SAF/FM senior leadership stated that the SAF/FM KM program does not address data management; therefore, this knowledge theme was not assessed.

## Knowledge Theme – Knowledge Documents

*Acquire (Knowledge Documents)*

The acquisition process with regard to knowledge documents includes accumulating knowledge from multiple internal and external sources into a document repository (Freeze & Kulkarni, 2006). The responses indicated that knowledge documents are accumulated mainly through the discretionary posting of the members and knowledge owners of the CoPs. For example, one person remarked, “Every time we'd do a document that we thought could pertain or help someone throughout the FM community, we'd post it in the CoP and...and send the link out to the FM community.”

*Store (Knowledge Documents)*

The storage process with regard to knowledge documents is realized through a knowledge document repository that is easily accessible (Freeze & Kulkarni, 2006). The SAF/FM KM system serves as the repository for the knowledge documents of the organization. Each FM CoP uses the document management system that allows for the storage of all file formats (documents, memos, reports, spreadsheets, presentations, HTML files, databases, graphics, etc.) Documents were also reported to be stored on organizational shared drives.

#### *Present (Knowledge Documents)*

The presentation process with regard to knowledge documents deals with having a broad set of categorization schemes in order to support the mental models necessary for the knowledge workers' minds to efficiently locate the required information and knowledge (Freeze & Kulkarni, 2006). For SAF/FM the categorization of knowledge documents within the CoPs is the responsibility of the knowledge owner of the CoP--there is not a categorization scheme or taxonomy that spans the entire KM system and all CoPs. Consequently, each CoP's categorization scheme may vary. The taxonomies within each of the CoPs reportedly helped the interview subjects find knowledge documents. For example, one person related he would search for knowledge documents in the same manner as searching for lessons learned, saying, "I would typically go look to see what type of CoPs are out there [on the SAF/FM KM system] ... and see what type of documents they have."

#### *Apply (Knowledge Documents)*

The application process with regard to knowledge documents requires the use of search tools to aid in the retrieval of relevant knowledge (Freeze & Kulkarni, 2006). The effectiveness of the application may be measured in terms of improved general understanding of problems and better problem resolution (Freeze & Kulkarni, 2006). All of the respondents stated that they used the various search capabilities of the SAF/FM KM system to locate documents. Although there were variances reported, a majority of the respondents stated they had some difficulty in locating relevant knowledge documents. One interview subject stated "... a lot of times [the search] will pull up more information than you really need and you have to keep doing searches until you [find] what you're looking for."

### **Research question #2: How do the results from research question #1 translate into KM capability levels?**

#### **Assessment of Expertise Capability**

Domain expertise and contact information of experts are not formally captured within SAF/FM. The identification of experts relies on volunteers within the FM community posting their information on the 'Wisdom Exchange' tool and/or within individual CoPs. Respondents revealed they depend on experts but are limited to manually searching through CoPs and posted comments within 'Wisdom Exchange' to find them. When unsuccessful, they also depend upon their own contact lists and social networks to identify expertise. As such, the overall capability level for the knowledge theme, *expertise*, was assessed at a capability level 2 out of a possible 5.

#### **Assessment of Lessons Learned Capability**

Lessons learned are not formally captured within SAF/FM. This process is left to the discretion of the CoPs. Consequently, without a central repository, lessons learned are difficult to find within the KM system. However, it was apparent that documenting, storing, and applying lessons learned was important for the success of the organization. As such, the overall capability for the knowledge theme, *lessons learned*, was assessed at a capability level 2 out of a possible 5.

#### **Assessment of Knowledge Documents Capability**

Knowledge documents are actively used within the SAF/FM KM system. Repositories and categorization schemes are available throughout the FM CoPs. Although the categorization schemes are not standardized across CoPs, responses indicated that the taxonomies within the CoPs are adequate. The overall capability level for the knowledge theme, *knowledge documents*, was assessed at a capability level of 3 out of a possible 5.

### **CONCLUSION**

The research revealed that a qualitative assessment of an organization's KM capability using the KMCA framework is possible, as well as beneficial, when survey administration is not feasible. The qualitative nature of the research allowed the collection of rich, contextual data that gave substance to the various capability level assessments as well as provided an illumination of specific SAF/FM KM activities that comprise those levels. Specifically, the research revealed implications for both practice and theory. For practice, the use of the KMCA methodology to guide this case study provided rich feedback for SAF/FM with regard to current state of its KM program/efforts and directions for future action. The research revealed capability level scores of 2-3 out of 5 which indicated that while the SAF/FM KM program may be exemplary within the AF, it still has much room for improvement. Needed actions include developing a centralized, searchable expertise repository, examining the need for a KM system-wide taxonomy, improving document meta-tagging and search, formalizing the capture and storage of lessons learned, and exploring the inclusion key FM data as an element of the KM system. SAF/FM must also capitalize on the pockets of the FM community that

have higher KM capability levels and work to replicate the expertise across the FM community. As for theory, the research indicated that, although originally designed for quantitative assessment, the KMCA also provides an excellent framework for qualitative KM capability assessments. The methodological approach used in this research indicates a potential for generalizing to similar organization contexts that do not support survey administration. In comparing the results of this research with those previously reported by Freeze and Kularni (2005, 2006), it was found that the framework consisting of knowledge themes/knowledge life cycle processes was robust and allowed for capture/identification of all SAF/FM KM program activities and subsequent capability assessment. One issue that should be noted, however, was that researchers experienced some difficulty interpreting the overall KMCA capability level (scores) in relation to a KM program that spans an enterprise-wide community. The results revealed that some groups within the larger SAF/FM community are utilizing the SAF/FM KM system to accomplish KM activities at higher capability levels than others. As a result, disparities across units may not be reflected in any overall capability level assessment for any of the knowledge themes. Given the desire of many organizations with active KM programs to assess or benchmark their KM capabilities and/or KM maturity while simultaneously identifying specific areas for improvement, this research is important in that it highlights an additional, theoretically sound approach to doing so.

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