

A Quality Approach to Tacit Knowledge Capture: Effective Practice to Achieving Operational Excellence

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Knowledge loss resulting from an aging workforce continues to be a management nightmare that has obliged many organizational leaders to develop strategies aimed at documenting mission-critical knowledge. Yet knowledge captured and stored in repositories continues to lack quality. The purpose of this study was to explore the impact of integrating quality management into the tacit knowledge capture process. Further studies on the effects of personality in the knowledge capture processes could lead to insights on reasons for diminished knowledge quality. From a social perspective, the implementation of a model that encompasses personality and quality management could improve decision-making processes.

Keywords: *critical knowledge, knowledge capture, knowledge loss, knowledge quality, quality control, quality management, tacit knowledge*

Introduction and Background

As early as 1990, the leaders of many organizations began facing the issue of declining knowledge resulting from an aging workforce. Employees in the private and public sectors, including government, continued to pursue retirement based on the earliest eligibility. This phenomenon continues to threaten operational continuity within organizations around the world with a substantial increase in aging populations (Profeta, 2004). The importance of the global issue of an aging workforce is evident in the agenda of the World Assembly of the United Nations held in Vienna, Austria, in 1982 and Madrid, Spain, in 2002. The United Nations' (2002) agenda focused on the negative effects of aging (neglect, abuse, and violence) within communities. Although the negative effects discussed at the assembly did not directly relate to the subject matter of the current study, the development of the agenda demonstrates that the issue of an aging workforce poses a real threat to organizations. In performing knowledge-capture activities, many organizational leaders paid little attention to quality concerns resulting in diminished knowledge value (Dalkir, 2005). Building institutional knowledge begins with capturing individual knowledge for storage in a knowledgebase and accumulating the knowledge for future use. Prior to the emergence of knowledge management (KM) as a discipline, human resources (HR), information systems (IS), or information technology (IT) departments performed, and in many instances still perform, KM activities in many organizations (Davenport & Prusak, 2000).

Although KM is an emerging discipline in the field of management, it is unique because it focuses on a different dimension (manifested through a focus on the intellectual assets of the organization) in management than traditional management disciplines. Wright (1998) contended, “Combining the roles of personnel in HR and IT [could] lead to the creation of highly innovative and integrated processes and technologies . . . [which] is what knowledge management truly is” (p. 11). Despite the call for every employee to accept the duty of managing knowledge, the success of KM initiatives is the primary responsibility of the managers of different departments within the organization (Dzekashu, 2009). As an interdisciplinary model, KM is both a discipline and a tool for enhancing business performance.

Statement of the Problem

Organizations continue to face the impending loss of mission critical knowledge because of an aging workforce (Harrison, McKinnon, & Terry, 2006; Thibodaux & Rouse, 2005). In the United States, approximately 40% of the labor force is eligible for retirement (American Association of Retired Persons, 2006), which includes individuals on whom organizations depend for operational continuity. Organizational leaders must improve the quality of knowledge documented from such individuals. Despite the need to improve knowledge quality using enhanced capture activities and techniques, Fahey and Prusak (1998) observed most organizations focus on the quantity of the knowledge captured, which results in reluctance by knowledge workers to exploit knowledge stored in repositories (Gray & Durcikova, 2006; Kulkarni, Ravindran, & Freeze, 2007).

The problem described above has an impact on knowledge users’ enthusiasm to use knowledge repositories because they perceive the knowledge captured to be suboptimal (Gray & Durcikova, 2006). Kulkarni et al. (2007) contended knowledge quality and knowledge use are integral to ensuring the success of KM initiatives. Davenport and Prusak (2000) reported a possible cause of the problem emanated from failure to integrate quality management (QM) into tacit knowledge capture processes. A gap observed in literature is the lack of implementation of QM into the tacit knowledge capture process. In designing knowledge capture programs, many organizations tend to focus on technology (software and hardware) but fail to ensure the required human interface is considered in the design (Fahey & Prusak, 1998), which leads to a performance inadequacy and quality gap. Based on the literature reviewed, the relationship between the current study and previous research reinforced the idea of the elusiveness of tacit knowledge and the difficulty in managing it. The outcome of the current study to some extent diminishes the existing gap in research. Together with previous research, the study provides more knowledge in the area of study. The study differs from others because of its emphasis on the importance of a different paradigm—implementation of ISO 9001—in the process of tacit knowledge capture.

Purpose of the Study

The purpose of the qualitative case study was to determine how the implementation of QM in the process of tacit knowledge capture could improve knowledge value while ensuring operational excellence. The research questions were as follows:

1. How is the tacit knowledge capture process implemented at Cameroon Development Cooperation (CDC)?
2. How could the integration of QM into the tacit knowledge capture process lead to operational excellence at CDC?

In addition, the intent of the study was to establish the responsibilities of management in the development of quality policies and to address several QM process areas (management responsibility; resource management; product and service realizations; and measurement, analysis, and improvement activities) and several knowledge capture process areas (culture and people, processes and tasks, and technology).

Definition of Terms

This research focused on the following two main variables: QM (independent) and tacit knowledge capture (dependent). A brief overview of the constructs and related concepts follows.

Quality Management

QM has different meanings applied to either different processes or within specific business sectors. Some definitions deem it as an act or a process, whereas others see it as an outcome. Whatever the point of departure, QM is more a function of mindset (which includes an act, a process, and an outcome) than the latter. Therefore, QM is the planning required and a guided implementation (assurance) to ensure desired levels of excellence.

Tacit Knowledge Capture

Tacit knowledge capture describes the extraction of knowledge or experiential matter from individuals, groups, or organizations for the benefit of the same. The process includes identifying, acquiring, refining, and storing the knowledge for dissemination to practitioners or researchers.

Assumptions and Limitations

The assumptions of the study were that the participants would answer survey questions based on their expertise and experience in the areas of IT, KM, and HR. In conducting the study, it was assumed that access would be granted to information requested and that cooperation would be obtained from the participants within the organization. It was also assumed that quality standard pursued at the research site was linked to the culture of the organization and its partners.

The duration of KM initiatives and programs assessed at the organization at the time the study was carried out might have limited the findings in the study. Leaders at CDC might have had concerns that the engagement period would expand the daily workload of the participants, while the duration of the initiatives evaluated could have limited the outcome. Surveys are susceptible to response bias (participants might not be truthful), which is a common issue of credibility in research; therefore, to reduce the possibility of such bias, survey administration remained anonymous. The survey questionnaires included data collected from participants relating to opinions and perceptions. Perceptions, as Baumard (2001) and Schein (1999) described, are important because they translate into organizational culture, which is an important variable in the process of knowledge capture and retention. Data obtained from participants that included opinions and perceptions could have threatened the credibility of the study. There was an expectation that choice of research methods employed in conducting the study would minimize any threat to credibility and maximize the value of the outcome of the study. A limitation associated with employing qualitative research methods is the nongeneralizability of findings (Creswell, 1998).

Literature Review

Culture and People

Polanyi (1966) stressed the importance of the personal manner of knowledge construction that is affected by emotions and acquired at the end of the process involving every individual's active creation and organization of the experiences. This is the crossroads between personality and culture. Culture operates within a system. Often, when one talks about systems, an impression emerges that systems relate to IS or IT. A system is an assembly of components connected in an organized manner. To ensure proper functioning of systems, they must be broken down into separate components to understand the resources required. An organization is a system, and the components include people, processes, and technology. Human desire is usually not an end in itself, but a means to an end; with the satisfaction of certain needs comes the generation of others (Maslow, 1970). The general idea behind motivation theory is to engage humans in a behavior. The concern with motivation in the context of the organization is mainly how to make individuals perform in a desired manner, and an important issue raised in the discussion of the theory of motivation as it relates to the current study is the reluctance of individuals to share knowledge with their peers, which drives management to develop strategies geared toward encouraging workforce collaboration.

Florence (2008) explored federal civilians' perceptions of contractors (experts) as a source of knowledge transfer by employing the qualitative research method and case study tradition of inquiry. This research method was desirable because Florence sought perceptions of solutions to the knowledge gap identified in the study. The outcome of the study confirmed Nonaka and Takeuchi's (1995) socialization, externalization, combination, and internalization model. Florence stressed that the outcome of the study could benefit leaders of federal agencies in decision making, particularly as it relates to knowledge transfer and capture practices and consultant relationships.

Processes and Tasks

Dalkir (2005) described the KM cycle by Bukowitz and Williams as a process framework that outlines how "organizations generate, maintain and deploy a strategically correct stock of knowledge to create value" (p. 32). Pakirh (2001) emphasized the issue of knowledge relevance by noting, "Irrelevance can confuse the interpretation and application of relevant knowledge" (p. 30). Dalkir described the knowledge spiral model—the brainchild of Nonaka and Takeuchi (1995)—in terms of achieving creativity and innovation. Nonaka and Takeuchi described organizations as having cognitive abilities of their own apart from the abilities of the individuals within them.

The process of tacit knowledge capture involves four main steps (see Figure 1). Upon acquisition of the knowledge, the engineer uses information filtering technology to refine the knowledge, later storing it in a knowledge base (Walker, 2001). The review process is the step in which knowledge experts validate the content captured and approve it for storage in the knowledge base for later use.



Figure 1: *Tacit Knowledge Capture Process*

Technology

Researchers are developing tools and technologies at a rapid pace as KM gains ground in many organizations. Dalkir (2005) classified KM technologies according to the following schemes: (a) communication, (b) collaboration, (c) content creation, (d) content management, (e) adaptation, (f) e-learning, (g) personal tools, (h) artificial intelligence, and (i) networking. The two important techniques used in the capture of tacit knowledge are content creation and content management using artificial intelligence tools such as decision support systems and expert systems. The concern about KM systems is that corporate knowledge usually is diffused among papers, e-mails, files on server drives (explicit knowledge), and people's thoughts (tacit knowledge). Because the knowledge is identified in varied sources, it is hard to collect it together when needed. Many organizational leaders in recent years have focused on new solutions that consolidate these different locations of knowledge into a central point.

Methodology

Research Design

The purpose of the study was to determine how the implementation of QM in the process of tacit knowledge capture could improve knowledge value as a means of ensuring operational excellence. Simon (2006) underscored the importance of considering the use of a case study if the research consists of one organization and if the objective of the study is to observe patterns of internal and external influences. Trochim (2001) noted a case study is appropriate if the research consists of the intensive study of a specific context. Many authors define qualitative research by comparing it with quantitative inquiry (Creswell, 1998). Ragin (1987) noted a key difference between both methods of inquiry is in the number of variables and cases analyzed. In contrast to qualitative inquiry, quantitative research includes fewer variables and many cases.

The research was in alignment with the variables of qualitative research because they reflected the setting of the organization under study, the role of the researcher, the type of data collected, and how the data were collected and analyzed. The choice to use one organization for the study helped ensure greater depth in analyzing the data collected from the research site. The information gathered in the field was geared toward providing answers to the "how" questions that arose from the analysis of the KM activities and QM requirements. Although the study invoked the likelihood of using quantitative research approaches because of the analysis of data collected through surveys, Simon (2006) emphasized it is more appropriate to apply a qualitative method of research where a lack of structure exists in the data and the presentation of data is subjective.

Sampling Methods and Procedures

The selection of the HR, planning and development, IS, and other departments was appropriate for the study because of their direct or indirect responsibility for improving knowledge assets in the organization. Because fewer than 100 participants were surveyed from an overall population of approximately 9,500 employees, a nonrandom sampling method was employed. The expert population consisted of 170 managers. The participants selected in the study included individuals with known or demonstrable experience and expertise in business strategy, HR, KM, IS, and QM. Justification for the selection procedure was twofold. First, it was the best way to elicit the views of individuals who had specific expertise in the subject matter of the study. Second, the experts could provide evidence to validate the opinions of others.

Participants selected to be surveyed included 63 employees from (a) HR, (b) planning and development, (c) IS, and (d) other departments that might have a direct or indirect involvement with knowledge quality. Participants were selected as evenly as possible from each of the different departments to respond to the survey and complete an interview. The participants who responded to the surveys and interviews were individuals at the managerial level.

Instrumentation

The study included the use of a mixed-mode survey, face-to-face interviews, and mail surveys. Each of the interviewing options had its merits and demerits. Face-to-face interviewing is appropriate for conducting long interviews or where the use of visual aids, such as drawings and photographs, can assist in asking questions. The advantage of using face-to-face interviews, according to Singleton and Straits (2005), was the fact that it has a high response rate, usually as high as 80%, although the number decreases in large cities. Trochim (2001) posited interviews are generally easier for the respondent, especially if the researcher seeks opinions or impressions. In addition, because the study was qualitative, open-ended questions were used to seek participant perceptions.

Face-to-face interviews and survey questionnaires were used in gathering data from participants in the current study to help undermine any inherent biases that exist in both methods (Singleton & Straits, 2005). The advantage of using mail surveys was that they were inexpensive and did not require interviewers or interview supervisors. The downside was the time required to complete the data collection phase of the survey (Singleton & Straits, 2005). Although the survey method is effective in yielding dependable outcomes when used in conjunction with closed-ended questions, Singleton and Straits emphasized the use of interviews might supplement self-administered mail surveys in the following ways: "The interviewer has an opportunity to explain questions to respondents, probe for more adequate answers, or control the conditions under which the survey is completed and even who completes it" (p. 243). Upon completion of the planning process of the research, the survey questionnaires were hand-delivered to the selected study participants by the research assistants, a third party, while the face-to-face interviews were conducted personally.

The American National Standards Institute (ANSI)/American Society for Quality/International Organization for Standardization (ISO) and American Productivity and Quality Center standards recognized widely in KM and QM and adopted by many countries provided the instruments used for interviews and survey questionnaires. The ANSI (2000b) provided the requirements for implementing QM in both product and service industries, while ANSI (2000a) provided guidelines for the assessments of the key quality areas and activities. The American Productivity and Quality Center (2008) assessed the implementation and KM maturity of organizations. McCollum (2004) warned although an organization might be compliant through a set of quality standards, such

compliance did not guarantee the satisfaction of the compliance requirements of another set of standards. Hence, the outcome of this study is unique to the organization under study and cannot be generalized. There are, however, best practices that can be drawn from the study and applied to other organizations.

Data Collection and Analysis

To understand the impact of implementing QM in the process of tacit knowledge capture at CDC, primarily surveys were used. Reviewing documents and conducting interviews complemented the administration of surveys. The questions posed in the survey were open-ended, thus leaving latitude for the participants to provide information otherwise not covered in the survey instrument. The use of open-ended questions enabled further probing of issues that were material to the study. The closed-ended questions were used to elicit demographic data. For information collected through interviews, an audio tape recorder was used and field notes were written. After field data collection, data were consolidated, transcribed, and coded for anonymity for better handling in terms of analysis, organization, search, and storage. One of the methods used in analyzing the data was categorizing and coding the data from the different sources (interviews, surveys, and document review). After the data were collected through surveys, a matrix of responses was completed to facilitate analysis. After completing the transcription of the interview, aggregation, and identification of key issues in the study, the rest of the analysis was completed.

The strategy for analyzing data commenced with taking field notes during data collection from the different sources and comparing them (Creswell, 1998; Merriam, 1998) for consistency. Content analysis is practical when open-ended questions are used in soliciting information, because it allows for defining content categories through coding. Selecting and defining categories (codes) is analogous to treating open-ended questions as if they were closed-ended in survey research (Singleton & Straits, 2005, p. 372). The content analysis technique was used alongside the pattern-matching technique for better data analysis. Singleton and Straits (2005) recommended using pattern matching when analyzing data. Creswell (1998) indicated, "People can learn from the case either for themselves or for applying it to a population of cases" (p. 154). Categories were constructed based on the data for analysis (Merriam, 1998). Employing pattern-matching techniques in data analyses supported the purpose of the study.

Credibility and Validity

Credibility is important because the researcher has a responsibility to minimize the effects of internal and external threats as much as possible, without negatively affecting the design of the study (Singleton & Straits, 2005). For any inference of conclusion, it was necessary to reduce the plausibility of most threats to credibility (Denzin & Lincoln, 2000; Trochim, 2001). The American Society for Quality and the American Productivity and Quality Center validated the survey instruments administered to the participants in the study. Modification of the instruments involved selecting particular questions that answered the research questions and restating the questions to achieve consistency with the research methods. The acceptability of the two standards helped validate the instrument used in the study. With concurrence from both standards, the questions were modified, restated, and reorganized into thematic groups to suit the objectives of the study. By using multiple sources of data, a procedure was developed for establishing credibility in the case study (Merriam, 1998). Merriam also noted qualitative research involves simultaneous data collection and analysis. Through use of triangulation, evidence was corroborated and obtained from multiple sources (Creswell, 1998). The individuals from different groups (HR, planning and

development, information systems, and other departments) who participated in the survey also brought credibility to the study.

Findings

Evaluation of Research Data

Though not necessary for the study, the demographics (age, gender, marital status, education level, job classification, and length of service) of the experts in the database were analyzed. The sample (experts) data were extracted from the database management system. The identifier for the experts was the experience criticality score in the database. The experts were 170 management-level employees, from which 63 experts were selected. Table 1 provides the educational-level data of the research participants. The average educational level by category of the QM respondents was 3.35, while for the KM respondents the average was 3.23.

Table 1: Educational Level

Educational Level	<i>M</i>	<i>SD</i>	Minimum	Maximum
QM (<i>n</i> = 23)	3.35	0.65	2	4
KM (<i>n</i> = 26)	3.23	0.59	2	4

Note. QM = quality management; KM = knowledge management.

Table 2 provides the length of service data of the research participants. The average length of service by category of the QM respondents was 2.39, and for the KM respondents the average was 2.54.

Table 2: Length of Service

Length of Service	<i>M</i>	<i>SD</i>	Minimum	Maximum
QM (<i>n</i> = 23)	2.39	0.84	1	4
KM (<i>n</i> = 26)	2.54	0.90	1	4

Note. QM = quality management; KM = knowledge management.

Analysis of Relevant Research Data

Initial analysis revealed that survey questions within each process area varied in their relevance to the research questions. Due to the variations cited above, it was necessary to reduce the data mass to ensure in-depth analysis of the remaining data. The process of reducing the data mass involved identifying the survey questions that were most relevant to answering the research questions. The unselected responses resulting from the survey were not analyzed and did not influence the conclusions arrived at in the study. The results of the data analysis were categorized to correspond to the research questions they each addressed. The categories addressed were effective implementation of knowledge capture processes and effective integration of quality control processes.

Examination of Research Questions

The study began with the selected participants signing necessary consent and voluntary participation forms, scheduling interviews, and sending reminders to complete the survey. The findings were shared with CDC following the compilation of the data and analyses. The research design for the study involved using the qualitative research method and the case study tradition of

inquiry. The design was appropriate because the study included one organization, and the research questions were consistent with “how” and “why” types of questions used in case studies. The process of reducing the data mass involved identifying the survey questions that were most relevant to answering the research questions.

The results of the study provided empirical support for Polanyi’s theory on tacit knowing. Tacit knowledge is highly internalized and difficult to articulate, thus posing difficulty in identifying for the purpose of developing proper processes for capturing knowledge. Many organizational leaders focus on developing technologies to facilitate the knowledge capture process, thus failing to pay attention to the role of human interface (Fahey & Prusak, 1998), and therefore miss opportunities to maximize performance, whereas other organizational leaders focus on human interface. The complexity of understanding tacit knowledge is indicated by the fact that tacit knowledge is contextual, cannot be applied to all instances, and thus leaves little room for adaptation.

Quality knowledge is achievable through the implementation of quality standards, as part of a well-thought-out process. KM is about people, processes, and technology. Organizations are formed to achieve goals that cannot be achieved by individuals. As such, an organization’s capacity to achieve congruence, or fit, between people, process, structure, and environment (Cummings, 1980) is dependent on how the components are managed. The sociotechnical theory, which states that organizations create value under social and resource constraints, takes into consideration the context or external business environment and overall dynamics. The findings of the study essentially supported this theoretical framework. The study confirmed that adopting QM, in the process of documenting critical knowledge, could lead to greatly improved knowledge quality, as well as to operational excellence or better organizational performance. Organizations are encouraged to implement quality standards that best fit their culture.

Summary and Implications

Summary

The data relevant to the findings in the study came mainly from the survey questionnaires, interviews, and document reviews. More than 53% of the survey participants reported that the KM tools available to the organization adhered to KM procedures for tacit knowledge capture processes. More than 66% of the participants reported that rewards and recognitions at CDC aligned or adhered to KM requirements to encourage knowledge capture. Sixty percent of the participants reported that the communities of practice within the organization adhered to the requirement of furthering knowledge activities within the organization. More than 43% of the participants reported that the use of knowledge sharing and reuse efforts in the organization adhered to KM requirements or procedures. Sixty percent of the participants reported that the methods used in tracking, measuring, and reporting the outcome of knowledge activities adhered to KM procedures.

QM activities assessed included: quality policy and planning, management responsibility, managing systems and processes, and measurement analysis and improvement. The results were as follows: 63.3% of the participants reported that the top management’s demonstration of leadership, commitment, and involvement produced maximum impact on processes within the organization; 46.7% of the participants stated that the quality policies in place translated to visible and expected improvements, as such, generates maximum impact; and 10.0% stated that it provided minimal impact. More than 53% of the respondents stated that management-reviewed activities have maximum impact on the effectiveness and efficiency of processes within the organization. Forty percent of the respondents stated that organizational leaders used self-assessment of the QM system

for improving overall effectiveness and efficiency, resulting in maximum impact on other processes. More than 53% of the participants reported that the method used by the organizational leaders in analyzing data for performance assessment had maximum impact on the organization. Both surveys were intended to determine tacit knowledge capture processes and QM integration into knowledge capture processes following KM and QM key process areas. Due to the 18.3% nonresponse rate, accurate determinations of the knowledge capture processes and integration of QM in knowledge capture practices could not be achieved.

Implications

There is a great need to develop systems that capture tacit knowledge more effectively. Researchers have largely ignored this area, mostly due to the difficulty developing a system that can deliberately isolate knowledge and select just the tacit knowledge required for storage. QM provides the context for organizations' learning and knowledge acquisition. Although the discipline of KM is relatively new, it has been demonstrated to transform many organizations in terms of the type of technology acquired, the culture, the management style, and a refocus from competition to collaboration. Isolated concepts of total quality management, Six Sigma, and lean management have been incorporated into KM, which strives to pull together resources.

From a social change perspective, the study has the potential of affecting management, both strategically and in practice. Strategically, tacit knowledge capture is critical when an issue of knowledge continuity arises or due to other concerns with groups and the organization as a whole. Organizational leaders can benefit from developing a knowledge map or taxonomy that describes the knowledge critical for operations, skills required to perform the tasks, and individuals currently performing these critical tasks (knowledge profile). Organizational leaders would have to develop a contingency plan in which at least two persons perform every job in the organization, facilitated by the development of a knowledge profile for every newly hired employee.

The implication for social change in practice is tied to the concern that critical knowledge capture is fairly vague to individuals, as it requires the continuous education of staff on the importance of knowledge sharing. Encouraging employees to share knowledge is not a particularly easy task because of the prevalence of the *knowledge is power* paradigm. When organizations reward knowledge sharing, the result is higher levels of sharing among employees, which leads to a positive culture of knowledge sharing. The creation of communities of practice or brainstorming groups can only foster the need for a knowledge sharing culture.

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