

Organizational Cultural Theory and Research Administration Knowledge Management

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Abstract: *The administration and management of sponsored projects spans many levels within an institution of higher education. Research administration professionals require an operational understanding of a complex and intertwined set of disciplines that include project management, finance, legal, ethics, communication, and business acumen. The explicit knowledge needed for research administration is visible in work processes, policies, procedures and organized knowledge repositories. The implicit, or tacit knowledge required for the profession is much more difficult to externalize, codify, store and share. The management of this knowledge is greatly affected by the culture of the organization where the person works and the research administration community of practice. By applying organizational culture theory to the research administration profession and exploring shared artifacts, espoused beliefs and values, and basic underlying assumptions, barriers and opportunities for knowledge management initiatives are realized. Creating and sustaining a knowledge-sharing community involves establishing knowledge leaders in organizations that exhibit the ideals, beliefs and principles of the profession, allocating opportunities for research administration professionals to communicate and share, utilizing dynamic information systems, and establishing metrics for knowledge management initiatives.*

Keywords: *research administration, knowledge management, organizational culture theory, higher education*

Background and Objectives

Research conducted at colleges and universities is big business. It is an integral part of a institution's mission and represents a significant portion of the academic activity on campuses. The research endeavors can increase the prestige and competitive standing of the institution (Turk-Bicakci & Brint, 2005). In response to this climate, higher education institutional leaders are promoting and developing more complex research strategies that include interdisciplinary, intercollegiate, and international collaborations (Derrick & Nickson, 2014; Langley & Huff Ofosu, 2007; Rutherford & Langley, 2007; Turk-Bicakci & Brint, 2005). As the political and global environment of sponsored research at universities increase, so do the management, fiscal accountability, and reporting requirements of research projects (Lintz, 2008; Rutherford & Langley, 2007; Smith, Trapani, Decrappeo, & Kennedy, 2011). These factors have expanded the administrative requirements of research and increased the essential domain of knowledge that research administrators must possess to accomplish their responsibilities.

The administration and management of research at an institution of higher education is a multifaceted task that spans an institution. Collectively research administrators at institutions of higher education form a *community of practice*. A community of practice is defined as a group of people, who share a craft or profession (Lave & Wenger, 1991). Research administration across institutions of higher education also forms a type of organization. March and Simon (1993) define an organization as a “system of coordinated action among individuals or groups whose preferences, information, interests, or knowledge differ” (Organizations, p. 2). An organization survives through the control of information, formation of an identity, creation of shared stories and incentivizing acceptable behaviors (March & Simon, 1993).

Research administration represents the business support necessary for the success of any exploratory initiative (Kulakowski & Chronister, 2006). The collection of knowledge that research administrators are required to grasp in order to accomplish their duties spans a diverse range of disciplines. These professionals require a working knowledge of business and project management, and the legal, ethical, scientific, and fiscal components of academic research (Kulakowski & Chronister, 2006; Shambrook & Roberts, 2011). In order for the profession to grow and evolve, this knowledge has to be collected, categorized, and shared among the research administration community of practice. The successful management of knowledge in any organization is highly influenced by culture. Applying organizational culture theory to the research administration profession and exploring the shared artifacts, espoused beliefs, values, and basic underlying assumptions of research administration, reveals common barriers to knowledge management and opportunities for creating a knowledge-sharing research administration community of practice.

Knowledge and knowledge management

Knowledge is the most valuable resource in any organization. It is the cornerstone of an institution’s competitive strategy and necessary for an organization’s survival (Davenport & Prusak, 1998; Naserieh, Pourkiani, Ziaadini, & Fahim, 2012; Serban & Luan, 2002; Schmitz, Rebelo, Gracia, & Tomas, 2014). Knowledge enables a person to interpret incoming information and data about a situation and identify the implications of that information to either take action or ignore it (Steyn, 2004). Davenport and Prusak (1998) provide a comprehensive definition of knowledge:

Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms. (p. 5)

Knowledge differs from data or information. Data is a collection of separate, objective facts about an event that can be measured qualitatively or quantitatively, but provides no interpretation, or basis for action (Davenport & Prusak, 1998; Serban & Luan, 2002). Information is data that has been given shape and organized in some manner by the members of an organization to be relevant and purposeful (Davenport & Prusak, 1998; Drucker, 1988, O’Dell & Grayson, 1998). Knowledge therefore, “is the application of experience and judgement to information by an individual, group or organization” (Serban & Luan, 2002, p. 8). Knowledge results when people

personally transform information into their personal knowledge, store it, and use it to create new knowledge.

Knowledge can be characterized as having two forms: explicit and tacit. Explicit and tacit knowledge are not mutually exclusive, but coexist within an institution at the individual, group, and organizational levels (O'Dell & Grayson, 1998; Sabherwal & Becerra-Fernandez, 2003; Serban & Luan, 2002). Explicit knowledge is found in an organization's policies, procedure manuals, and institutional documents such as the mission, vision and value statements and is easily codified, stored and transferred (Gao, Meng, & Clarke, 2008; Kidwell, Vander-Linde, & Johnson, 2000). Tacit knowledge is personal and individualized. It is created and validated by personal experience, contextualized in specific situations, influenced by personal values, and cannot be easily communicated or transferred (Cardoso, Meireles, & Ferreira Peralta, 2012; Kidwell et al., 2000; Nonaka, 1994; Polanyi 1966). It is the management of this knowledge, specifically tacit knowledge, that promises to deliver huge returns for organizations and occupations that learn use it effectively (Kidwell et al., 2000).

Management of this knowledge is critical to the success of the profession of research administration and the institutions in which research administrators work. Knowledge management in higher education can lead to better decision-making capabilities, reduce costs, and improve the efficiency and effectiveness of academic and administrative services by transforming tacit knowledge into explicit knowledge (Kidwell et al., 2000; Steyn, 2004). Knowledge management can be defined as the systematic process of identifying, capturing, and transferring the know-how, experience, and intellectual capital of people within organizations (Davenport & Prusak, 1998; Nonaka, 1994; Steyn, 2004). There are six phases in the knowledge management process according to Cardoso (as cited in Schmitz et al., 2014): creation and acquisition; attribution of meaning; sharing and diffusion; organization memory; measurement; and recovering. "The success of a knowledge management program is measured using the dimensions of the impact on business processes, strategy, leadership, organizational culture, and the efficiency and effectiveness of knowledge management processes" (Jennex, Smolnik, & Croasdell, 2009, p. 183).

A key component of knowledge management is to create new knowledge within an organization, thus promoting its continued existence and value to stakeholders (Nonaka, 1994). The same is true for the profession of research administration. Knowledge management initiatives are accomplished by making intellectual capital available to others (Nonaka, 1994; Steyn, 2004). Knowledge creation is accomplished through four modes as described by Nonaka (1994): socialization, externalization, internalization, and combination. "New knowledge starts with individuals sharing their internal tacit knowledge through socializing with other people or by obtaining it in digital or analog form" (Steyn, 2004, p. 618). Culture plays a vital role in the accomplishment of knowledge management.

Organizational culture

Culture is an important aspect of any institution and yet, it is difficult to find a single, unified definition of culture. Shein (2010) defines organizational culture as "A pattern of shared basic assumptions learned by a group as it solved its problems through external adaption and internal

integration, which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems” (p. 18). An organization’s culture can be divided into three levels: *artifacts, espoused beliefs and values, and basic underlying assumptions* (Schein, 2010). Artifacts are easily observed in the physical spaces of the institution, the apparent behaviors of employees, and how work is organized and processed (McDermott & O’Dell, 2001; Schein, 2010). *Artifacts* can be aligned with the explicit knowledge within an organization. *Espoused beliefs and values* can be seen in the organization’s stated vision, mission and goals but also can be found in individual ideals, principles and personal aspirations (McDermott & O’Dell, 2001; Schein, 2010). This level of culture is expressed as explicit knowledge and also the more personal, unspoken tacit knowledge. The cultural level of *basic underlying assumptions* represents the unstated thoughts, feelings, and perceptions that influence decision-making actions and employee behavior (Schein, 2010). This deeper level of culture is the invisible dimension of an organization not easily or readily communicated and relates to tacit knowledge (McDermott & O’Dell, 2001). In addition to these levels of culture within an institution, there also exist a collection of subcultures and micro-cultures that are based on organizational hierarchy, geographic location, or are defined by a common set of functions or tasks performed by a group of individuals (Schein, 2010). Each of these subcultures and micro-cultures can have their own artifacts, espoused beliefs and underlying assumptions within the same institution. Issues within organizational culture present some of the most difficult barriers to knowledge management success (Conley & Zheng, 2009) because it determines what ‘knowledge’ is, how it is stored and communicated, and what knowledge is important.

Organizational culture and the impacts on knowledge management

An institution’s culture significantly impacts knowledge and knowledge management (KM) tools, processes, and initiatives (McDermott & O’Dell, 2001). Leibowitz (1999) states that knowledge management is 90% dependent on building a supportive KM culture. Furthermore, Wong and Aspinwall (2004) indicate that culture is the second most critical success factor to KM behind leadership/management support. There are four primary ways in which the culture of an institution and knowledge management interact within an organization., Institutional culture: 1) shapes assumptions and determines what knowledge is useful and important to an organization; 2) empowers those who owns a particular knowledge; 3) determines what is the knowledge; and how is it communicated; and 4) decides the acceptance or rejection of new knowledge through validation by the organization (DeLong, 1997). These intersections influence the success or failure of KM projects.

Four barriers exist to the successful sharing and transferring of knowledge within an organization that are directly related to an institution’s culture. The first barrier is ignorance on both ends of the transfer of knowledge (Serban & Luan, 2002; Szulanski, 1993), i.e., individuals with knowledge do not realize its value to others, and others seeking knowledge do not know where to find it. The second barrier is the lack of resources to obtain the knowledge (O’Dell & Grayson, 1998; Szulanski, 1993). This barrier reflects the lack of internal processes or technology to enable the collection, retrieval, and sharing of knowledge. The third barrier is the lack of relationship between a knowledge holder and the knowledge receiver (Serban & Luan, 2002; Szulanski, 1993);

opportunities for the social exchange of information through shared experiences and storytelling are hindered by the organization's structure and the value of collaborative spirit. Lastly, the slow rate of adoption of new knowledge is caused by a lack of motivation within the organization which creates a barrier to KM and is impacted by the organization's reward system (Davenport & Prusak, 1998; O'Dell & Grayson, 1998; Szulanski, 1993).

Higher education institutions are often structured by function or discipline that operate independently of each other and with varying degrees of autonomy. Higher education institutions are also bureaucratic entities with complex political systems that serve different interests of stakeholders (Ramachandran, Chong, & Ismail, 2009). Inherently, "as in the business environment, functional areas within many higher education institutions often fail to share knowledge that can lead it to the establishment of a higher standard of education" (Ramachandran, et al., 2009, p. 204). Adding complexity to this environment is the dual challenge research administrators face: simultaneously serving the researcher, while promoting and protecting the best interest of the organization (Lankford, 1997). These barriers must be successfully addressed to promote a learning organization.

Methods

The supporting data presented in this paper are the results of the first round of a Delphi study, which was part of a larger exploratory sequential mixed-methods research project.

Delphi technique

The Delphi method leverages the knowledge and experiences of a select group of experts or qualified professionals to obtain a consensus on multidimensional issues or topics. This methodology is appropriate for researching complex issues such as those found in the profession of research administration "where large scale quantitative hard data fails to unearth the richness in tacit knowledge to help the research understand subtle expert opinion" (Grisham, 2009, p. 112). There are four goals associated with a Delphi study: 1) gather and summarize knowledge from an expert panel; 2) obtain an agreement or consensus concerning the topic or issue; 3) explore ideas with knowledgeable participants; and 4) provide information to aid in decision-making (Abu, Ritchie, & Jones, 2012). The Delphi technique was developed by the RAND Corporation in the late 1950's as a method to aid in policy creation and decision-making (Dalkey, 1967).

The Delphi research method has several additional advantages. The first is participant anonymity (Dalkey, 1967); participants individually provide their responses to prepared questions directly to the researcher thus reducing group pressure and the influence of dominant individuals (Dalkey & Helmer, 1963; Grisham, 2009). The second benefit is that through a repetitive, or iterative process it forms a consensus among the expert panel (Dalkey, 1967; Abu et al., 2012). Thirdly, the Delphi Method is systematic, flexible, and allows for the use of a variety of communication methods and tools (Dalkey, 1967; Abu et al., 2012). Lastly, it produces reliable and valid results (Abu et al., 2012; Dalkey, 1967; Grisham, 2009). Grisham (2009) states that, "The Delphi technique has been demonstrated in the literature as a reliable empirical method for consensus

reaching” (The Delphi technique: a method for testing complex and multifaceted topics , p. 116).

Population and sample

A purposive sampling technique was employed for this study. Bryman (2012) states, “The goal of purposive sampling is to sample participants in a strategic way so that those sampled are relevant to the research questions that are being posed” (p. 418). A study utilizing the Delphi technique can have any number of participants. The ideal sample size of experts is one that is large enough to represent the population, conduct the desired research, and yet is manageable by the researcher (O’Leary, 2014).

The population for this study consists of self-identified research administrators from Very High and High Research Institutions according to the Carnegie Classification of Institutions of Higher Education. The minimum requirements for the participants were at least eight years in the field of research administration, familiarity with both the pre-award and post-award research activities, and routine use of an institutional information system to manage sponsored research. The recruitment of participants was conducted through e-mail solicitations. Confidentiality of the participants was maintained through the study by having the participants provide their responses directly to the researcher. All data was stored in a locked cabinet and on secured storage devices. The Institutional Review Board (IRB) of Robert Morris University (RMU) approved the protocol for this research.

Instrumentation

The survey instrument was a modified survey questionnaire based on the critical success factor survey outlined in *CMU/SEI-2004-9TR-010: The critical success factor method: a foundation for enterprise security management* (Caralli, Stevens, Wilke, & Wilson, 2004). The survey asked participants to provide demographic information related to their gender, name of institution, business title and level, and number of years of experience in the field of research administration. Participants identified the information systems they currently used, key business functions, important goals and objectives within their area of responsibility, and problems or obstacles experienced while performing their duties as research administrators.

Data analysis

Data analysis began with the demographic nominal and ordinal information provided by the participants. Next, open-ended responses were categorized into major themes with repetitive answers consolidated. In vivo coding was utilized to create the categories. In vivo coding consists of using the words of the participant to create categories (Creswell, 2014; Bryman, 2012). The software application Nvivo® along with a spreadsheet application was used to code the open-ended participant responses. To ensure objectivity, an expert in the field of research administration that met the expert criteria and who did not participate in the survey reviewed the coded material to ensure consistency and validity (Creswell, 2014).

Results

The Delphi study began by selecting 149 potential participants using a direct sampling technique. Individuals holding leadership positions from a research administration professional organization provided the potential participant list. E-mail invitations were sent on a weekly basis to potential participants. Twenty-two participants (14.8%) met the required criteria and completed the survey. The demographic information of the participants is illustrated in Table 1. The gender statistics of the Delphi participants are comparable to the 2010 Research Administrator profile conducted by Shambrook and Roberts (2011).

Table 1: Delphi participant demographics

Gender	Demographic data			
	Male	Female	Unidentified	
	4 (18.2%)	17 (77.3%)	1 (4.5%)	
Carnegie Classification	Very High	High		
	15 (68.2%)	7 (31.8%)		
Academic Unit of employment	Department or College level	Central or University level		
	5 (22.7%)	17 (77.3%)		
Years of RA Experience	8 - 10 Years	11 - 13 Years	14 - 16 Years	17+ years
	2 (9.1%)	2 (9.1%)	3 (13.6%)	15 (68.2%)

Artifacts

Artifacts play a key part in the administration of research and the management and dissemination of knowledge. Schein (2010) defines artifacts as the physical products of a group such as:

the architecture of the physical environment; its language; its technology and products; its artistic creation; its style, as embodied in clothing, manners of address, and emotional displays; its myths and stories told about the organization; its published list of values; and its observable rituals and ceremonies. (Organizational Culture and Leadership, p.23)

Certainly, research administrators across institutions of higher education have an established professional language, or jargon, to communicate with internal and external stakeholders. The physical space of offices, buildings, and the layout of a campus or organization influences the sharing of existing knowledge and the creation of new knowledge. More importantly, the division of labor and the vertical and lateral coordination of command and control, or organizational chart, create avenues or blockades to KM. Technology plays a major role in research administration.

Institutions use information systems and applications to manage sponsored research. These tools range from basic spreadsheet applications to customized electronic research administration (eRA) systems and institutional web sites. All 22 participants in the study listed at least two information systems they used to manage sponsored projects in their area of responsibility. Six of the 22 indicated using spreadsheet applications to augment institutional systems. The effective management and sharing of knowledge requires the artifacts of an organization or community of practice to be aligned with the goals of any KM initiative.

Espoused beliefs and values

Espoused beliefs and values represent the ideals, goals, values and aspirations of a population that have been validated and rationalized (Schein, 2010). Within the profession of research administration there exists a core set of beliefs and values that guide decisions, behavior and actions.

Table 2 illustrates the espoused values for research administrators participating in the study. The term 'accuracy' or the phrase 'to be accurate' was mentioned, on average, 2.72 times per participant. The value of building and maintaining positive relationships with all customers for research administration professionals and communication is consistent with previous literature (Kulakowski & Chronister, 2006). The categories of 'timeliness' and 'importance of reporting' allude to the research administrators' belief in organization and structure. Previous literature also indicates research administrators have a preference for, and value rules, authority, institutional boundaries, processes and systems (Derrick & Nickson, 2014; Atkinson & Gilleland, 2007). Campo, 2014, adds that in addition to communication, team building, and interpersonal skills, research administrators value a positive, can-do attitude, which is reflected in the importance of the category 'customer service'. Other values mentioned in previous literature but not included in the sample are the beliefs in strong character traits such as being ethical, principled, trustworthy, warm, supportive, and risk-averse. (Atkinson & Gilleland, 2007; Campbell, 2010; Campo, 2014; Derrick & Nickson, 2014; Lankford, 1997). The beliefs and values of the profession have a significant impact on what KM initiatives are pursued or terminated.

Table 2: Espoused beliefs and values of participants

	Number of times phrase was used	Percentage of Delphi participants using term
Accuracy	60	95.5%
Timeliness	46	81.8%
Communication	46	40.9%
Reporting (importance of)	37	77.3%
Customer Service	36	59.1%
Training	28	45.5%
Ease of access to information	13	59.1%
Relationships	11	50.0%
Tolerance (patience/flexibility)	5	22.7%
Humor	3	13.6%

Basic underlying assumptions

Basic underlying assumptions are different from prevailing, or strongly held values. Underlying assumptions represent the underlying patterns of behavior that have become so engrained in the actions, attributes, and mental models of the population that they are taken for granted and there is little variation within a social unit (Schein, 2010). Primary to the basic underlying assumptions concerning research administration is the ideal of service and servant leadership (Derrick & Nickson, 2014; Waite, 2001). This is collectively reflected in the statements of the sample population. Atkinson, Gilleland and Barrett (2007) support this position by stating that research administration is a profession because of the “ideal of service to clients and stakeholders, in addition to possessing specialized knowledge, and observing a code of ethics and principles” (The dimensions of influence on research administrator behavior: toward a theoretical model of research administration as a public service profession, p. 63). Gabriele & Caines, (2014) argue for the critical role research administrators play as servant leaders in the world of research itself. These basic underlying assumptions are critical and are at the center of knowledge management for organizations and professions. A commitment to the ideal of learning through sharing information must be an underlying basic assumption of the profession and organization for any KM activity. Lacking this quality requires a paradigm shift in the mindset of the population and sweeping cultural change.

Discussion

The cultural factors of artifacts, espoused beliefs and values, and basic underlying assumptions identify the elements of research administration that are crucial when initiating or evaluating knowledge management programs for the profession and the community of practice. Higher education institutions need to focus on mutual relationship and doing things together in order to have organizational knowledge management success (Nurluoz & Birol, 2011). “In higher education, knowledge management becomes a significant part of the quality improvement that

leads collaborative efforts of the professionals to share knowledge, construct knowledge in order to improve the efficiency for better work practices” (Nurluoz & Birol, 2011, p. 207). There is a significant amount of literature addressing knowledge management success in organizations to include the identification of critical success factors, best practices, principles, rules and applications. For the research administration community the practice four factors are essential to promote a learning culture.

First, organizational champions have to be identified and given the resources to lead KM initiatives (Davenport & Prusak, 1998; Kidwell et al., 2000). These advocates must be respected and outwardly represent the values and beliefs of the practice and symbolize the basic underlying assumptions of the profession through word and deed. Mas-Machuca examined the critical success factors of KM and found that trust, transparency, honesty, collaboration, professionalism, flexibility, and commitment were related to culture (p. 1308). These same qualities are essential for the knowledge champions of the organization. In addition, these stalwarts are simultaneously mentors, cheerleaders, defenders, marketers, and branding professionals who encourage the stimulation of knowledge collection and sharing. In essence, they are knowledge leaders.

Second, Davenport and Prusak (1998) state that in order to simply have knowledge shared and created, one needs to “put smart people in a room and let them talk.” (p.16). Organizational structures need to facilitate the exchange of information through socialization to codify and transfer tacit knowledge (Nonaka, 1994). This is true for both institutions of higher education and the community of practice as a whole. This is accomplished by providing space for the assembly of research administrators at all levels within the institution and allocating sufficient time to present and share information. One manner to accomplish this task is to encourage research administrators to attend professional meetings. There are several United States-based professional organizations that hold meetings locally and regionally for research administrators at all levels. These organizations also hold an annual membership meeting. Meetings provide the opportunity to network with other professionals, enabling attendees to discover who possesses knowledge, to identify individuals seeking knowledge, and to engage in all four modes of knowledge transfer as indicated by Nonaka (1994).

Third, the use of technology enables the transfer of explicit knowledge. Along with individual institutions using technology to establish knowledge repositories, there are knowledge “banks” available within the profession. These systems allow the transfer information and explicit knowledge; however, they are considered “passive disseminators” with users only accessing them for specific information when needed (O’Dell & Grayson, 1998). Regardless of the database or knowledge repository utilized, users have to find value in the information. Users create knowledge by interpreting and giving meaning to the information stored on these systems (Steyn, 2004). The information system needs to be easy to navigate, robust, continually updated, and linked to existing work processes.

Lastly, as with any project or program, knowledge management initiatives have to be measured and assessed on a regular basis (Davenport & Prusak, 1998; Kidwell et al., 2000). This includes incentivizing and establishing a reward structure for seeking and creating knowledge to further the administration and management of research. The metrics or the evaluation of KM initiatives

should include both qualitative and quantitative measures for success (Davenport & Prusak, 1998). Additionally, the metrics should be tied to work processes, functionality, usability, and the strategic goals of the organization (Jennex, Smolnik, & Croasdell, 2009).

Further Research

The first round of results of the Delphi study identified information technology artifacts and espoused values of research administrators even though a direct line of questioning for these cultural elements was not the primary focus of the research project. Further research specific to these cultural elements should be investigated. Other cultural elements and the subculture and micro-culture levels of research administration should continue to be explored. The application of institutional, administrative behavior, and organizational theories related to the research administration community of practice could add depth of understanding to the profession.

Conclusion

The profession of research administration has developed in unprecedented ways since the end of the last world war. The knowledge required to successfully administrate research in institutions of higher education crosses multiple disciplines. The management of explicit and tacit knowledge is essential for the continued growth and development for the profession. Organizational culture plays a significant role in the success or failure of these projects. By applying organizational cultural theory and gaining an understanding of the artifacts, espoused values and beliefs, and basic underlying assumptions, research administrator knowledge leaders can identify and address potential obstacles to the successful transfer and creation of knowledge for their organization, the community of practice and the profession of research administration.

Authors' Note

The data and findings presented in this paper are the results from the first phase of a Delphi study, which was part of a larger exploratory sequential mixed-methods study for the author's doctoral dissertation.

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