
Initiating Knowledge Management in Colleges and Universities: A template

Naresh K. Agarwal*, Laila N. Marouf**

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ABSTRACT

Knowledge Management (KM) is a collaborative and integrated approach adopted at various levels to ensure that an organization's knowledge assets are best utilized to increase organizational performance. While KM has been adopted in a large number of sectors and organizations, colleges and universities, and the higher education sector in general, is yet to take full advantage of the possibilities offered by KM. Also, while past research has sought to highlight the importance of implementing KM in higher education, there is a lack of a single, clear template for KM implementation that universities leaders and administrators can adopt. The contribution of the paper is a practical, actionable, step-by-step plan, as well as a diagrammatic, theoretical framework for initiating KM successfully in colleges and universities.

1. Introduction

1.1. What is Knowledge Management?

Knowledge Management (KM) plays an important role in any organization by facilitating the capture, storage, transformation and dissemination of knowledge (Agarwal, Poo & Goh, 2005) in order to achieve organizational goals. It is often a collaborative and integrated approach adopted organization-wide to ensure that an organization's knowledge assets are best utilized to increase organizational performance. These knowledge assets include those that are in an explicit form (documents, books, reports, web pages, etc.), as well as those in the tacit form (difficult to articulate; the know-how that resides in people's minds - Polanyi (1966)). The key steps in the knowledge management process include: generating new knowledge; accessing valuable knowledge from outside sources; using accessible knowledge in decision making; embedding knowledge in processes, products and/or services; representing knowledge in documents, databases, and software; facilitating knowledge growth through culture and incentives; transferring existing knowledge into other parts of the organ-

* Associate Professor, Simmons School of Library and Information Science, Simmons College, USA (agarwal@simmons.edu) (Corresponding author)

** Department of Library and Information Science, College of Social Sciences Kuwait University, Kuwait (laila@kuc01.kuniv.edu.com)
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ization; and measuring the value of knowledge assets and/or impact of KM (Ruggles & Holtshouse, 1999; Dalkir, 2011). Alvarenga Neto et al. (2009) clarify that the word ‘management’ in KM should not mean control, but promotion of activities of knowledge creation and sharing in the organizational space. Thus, KM allows for the creation of an intelligent organization that is able ‘to learn from past experiences, whether successful or unsuccessful, and to create new knowledge’ (Ahmadi & Ahmadi, 2012, p. 658). KM operates at a few levels – people (competencies and learning abilities of individuals), organization (creation, utilization and development of an organization’s collective intelligence) and technology (an efficient and relevant communication and information infrastructure) (Ahmadi & Ahmadi, 2012).

While KM has been adopted in a large number of sectors and organizations ranging from ConocoPhillips, Fluor, IBM and MITRE (O’dell & Hubert, 2011) to the World Bank (Srikantiah & Koenig, 2008), colleges and universities, and the higher education sector in general, is yet to take full advantage of the possibilities offered by KM.

1.2. Motivation and Objective of the Study

While a number of researchers in the last decade have sought to highlight the importance of implementing knowledge management in colleges and universities (e.g. Kidwell, Linde, & Johnson, 2000; Pornchulee, 2001; Geng et al., 2005; Shoham & Perry, 2008; Tikhomirova, Gritsenko, & Pechenkin, 2008; Arntzen, Worasinchai & Ribiere, 2009; Blackman & Kennedy, 2009; Gill, 2009; Tian, Nakamori, & Wierzbicki, 2009; Adhikari, 2010; Omerzel, Biloslavo, & Trnavcevic, 2011; Zhang & Gao, 2011; Ahmadi, 2012; Ahmadi & Ahmadi, 2012; Al-Bastaki & Shajera, 2012; Matin & Kashani, 2012; Tikhomirova, Tikhomirov, & Maksimova, 2012), there is a lack of a single, clear template for KM implementation that university leaders and administrators can adopt.

Based on a review of the literature and the practical experience of both the authors in teaching KM and engaging in KM research, this theoretical study recommends a plan of action for colleges and universities to follow in order to ensure successful KM design and implementation. It seeks to provide practical, actionable advice to university leadership and administration on how to go about initiating KM. The research questions that the study seeks to answer are, “*How can colleges and universities successfully initiate KM? What are the steps to follow, and in what sequence?*”

We adapt the theoretical lens suggested by O’Dell & Grayson (1998), in addition to the APQC KM model (APQC, 2014; O’Dell & Hubert, 2011) in our analysis to arrive at comprehensive steps for KM planning, design and implementation. Along with a step-by-step path, the primary contribution of the study is a diagrammatic theoretical framework for initiating KM in a university setting.

The rest of the paper is organized as follows. In the next section, we review the relevant literature, and discuss the theoretical approaches and lens. We then go on to the KM implementation steps,

which is the main part of the paper. We then summarize the steps and propose a theoretical framework. We end the paper with conclusions and implications for theory and practice.

Let us now look at the literature review.

2. Literature review

The literature review is organized around four major themes:

2.1. Why is KM needed in colleges and universities?

The primary role of colleges and universities is imparting knowledge. Ahmadi and Ahmadi (2012) cite Wilhelm von Humboldt and John Henry Newman to highlight the idea that the freedom to pursue knowledge is a fundamental principle of democracy that defines the existence of universities, and that here, the pursuit of knowledge is an end in itself. Shoham and Perry (2009) define an educational organization as a 'loosely-coupled' organization with sub-systems partially connected to each other, and maintaining their own identity and autonomy. Limited guidelines are provided to direct the activity of any particular unit, yet all the various units are included in a single, more comprehensive organization (Shoham & Perry, 2009). Cohen, March, and Olsen (1972) define universities as 'organized anarchy' with unclear or even contradictory goals. Policies of higher education systems are often characterized by a lack of consistency and an inability to reach agreement, which makes universities difficult to manage (Cohen, March, & Olsen, 1972; Shoham & Perry, 2009).

Apart from these difficulties, colleges and universities are grappling with change. There is increased competition from other places that are able to award a larger number of scholarships or interest-free loans, and/or provide a lower cost of education. With the advent of online education, the traditional geographical base of universities is being attracted by far-off colleges and universities. Maintaining financial stability, growth, student retention, faculty and staff salaries and raises, and the reputation of the institution are all challenges facing most places of higher education. While it is well-known that new scientific discoveries are often made in areas between disciplines, the segregation of university departments and research into silos makes interdisciplinary research hard to institutionalize (Ahmadi and Ahmadi, 2012). In addition, the advent of Massive Open Online Courses (MOOCs) that provide courses from reputed universities for free to people worldwide provide challenges that higher education does not yet know how to make sense of. Advances in information and communication technologies (ICTs) and mobile computing (use of smartphones and tablets) has further changed the status quo in how students choose to learn.

Also, knowledge sharing processes are not integrated in the daily routines of faculty and staff, and there is huge duplication of effort. E.g. faculty are often involved in constantly re-creating existing teaching material instead of spending more time with students or on research (Arntzen, Worasinchai, & Ribiere, 2009). While universities expect publications from faculty, there is often

little to no guidance in the form of research groups, mentoring, collaboration or regular research meetings. Young professors have solitary, lonely journeys in their tenure process. One of the authors of this study met an instructor who wanted to delay having a child for 6 years until she got her tenure. Emphasis on solo-authored articles often deters collaboration. Also, limitations on where to publish limits the people one can collaborate with. There is no easy mechanism to know what faculty across campus are currently working on (as opposed to the static research areas listed on websites), and areas where they need help (either in a certain domain or method of data analysis). Open access repositories are not thriving in most places, with technology and systemic barriers to contribution in these repositories. The work done by committees is not always transparent to those outside them, until a decision is reached. There is not enough space for informal knowledge, knowledge in flux, to be shared and where people can participate and help in shaping. There is room for much greater interaction and synergy between university administration, faculty, staff and students and between the different units or schools across campus.

It is in this environment that universities must become agile and respond to change in a seamless and continuous manner. Tikhomirova et al. (2012) call these 'smart universities'. Tikhomirova et al. write that the mission of the smart university is to teach learners to live and work at the level of the most progressive ideas and culture. It faces the modern challenges and provides visions, insights and approaches to the solution of cultural, professional, scientific and research problems (Tikhomirova et al., 2012). Tikhomirova, Tikhomirov, and Maksimova (2012, p. 1173) recognize the following features of smart learning: 1) to master the ways and methods of capturing new knowledge and skills for self-learning and drawing new sources of knowledge; 2) to master skills of working with any kind of information, heterogeneous and contradictory data, to acquire skills of creative instead of reproductive thinking; 3) to add to a traditional principle of 'acquiring knowledge, skills and abilities' a principle of 'designing adequate competencies'; 4) to generate new knowledge, to transform tacit into explicit knowledge and to evaluate innovativeness; 5) to provide interoperability – dissemination of knowledge, interrelationship within groups and teams, high degree of integration of knowledge and innovation; and 6) to use knowledge intensively. Many of these ideas relate to 'design thinking' where solutions are not imposed; rather, they are allowed to emerge (Raney & Jacoby, 2010).

The knowledge-based theory of the firm (Grant, 1996) considers knowledge as the most strategically significant resource in an organization, and a major determinant of sustained competitive advantage and organizational performance. This is even more applicable in colleges and universities. The aims and objectives of colleges and universities are consistent with KM principles (Allen, 1988; Ahmadi & Ahmadi, 2012) – the discovery, acquisition, creation and dissemination of knowledge (research); the transmission of knowledge (teaching); the application of knowledge to human problems in the interest of public service; and the preservation of knowledge in libraries, archives and museums. Also, the emphasis on exchange of ideas and dissemination of knowledge through conferences and journals makes universities natural environments for knowledge sharing (Ahmadi & Ahmadi, 2012). Not only would KM help to enhance intra-organizational processes and strategy (Pornchulee, 2001), it would help enhance a university's reputation by streamlining the process of generating

research (Kidwell, Linde, & Johnson, 2000; Ahmadi & Ahmadi, 2012).

2.2. What knowledge are we seeking to manage?

One of the most common errors in effective knowledge management is not identifying or discussing what is meant by knowledge, because it is impossible to manage something that is not understood (Fahey & Prusak, 1998). Blackman and Kennedy (2009) state that while universities have long recognized their role as the producers of knowledge through research, and as the disseminators of knowledge through teaching, there is little evidence that their internal structures “have evolved to support the institutions’ increasing need to continually develop and adapt and to actively engage in innovation and knowledge creation in their governance and operation.” (p. 549). Blackman and Kennedy recognize that universities, like all organizations with strategic intent, need to engage in a conversation which clarifies the nature and the role of knowledge in their development.

Before coming up a plan for designing and implementing knowledge management, universities will need to determine what knowledge is for them – a product or a service one deals with every day. Do different units within the campus, and departments within them have different notions on how they view knowledge – different epistemological frames of knowledge? What is the knowledge needed? What is the knowledge available? What is the knowledge gap? An awareness of what knowledge is and where it is created (irrespective of whether for a specific school or unit within a college implementing KM, or the college as a whole) will impact the knowledge strategy to be used when implementing KM. Thus, the organization implementing KM would need to ponder on what is it that they’d like to manage, the types of knowledge they’d want to manage, and in what order of priority.

Most researchers of knowledge management classify knowledge into 2 main types – tacit and explicit.

1. Tacit knowledge is that which resides in the minds of faculty, staff, students and higher administration – the knowledge gained through life experience where “we can know more than we can tell.” (Polanyi, 1966,1983). Cross and Baird (2000) say that individuals “primarily absorb this knowledge through social interaction – by working with those who are applying knowledge gleaned from past endeavors”.
 2. When this individual tacit knowledge is articulated, codified, organized and stored in the form of documents, books, audio or video and stored in different media, it is termed explicit knowledge. Cross and Baird identify databases and intranet as stores of explicit knowledge. Geng et al. (2005) identify course syllabi as examples, as would be textbooks, and other documents produced. Cross and Baird posit that “people usually take advantage of databases only when colleagues direct them to a specific point in the database.” This is different from internet use. In a more recent survey study of 352 working professionals, Agarwal, Xu, & Poo (2011) found that online information is used more frequently, and for a higher percentage of time, as compared with face-to-face interaction.
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It is the constant goal of knowledge management (and a key determinant of the success of colleges and universities (Geng et al., 2005)) to retain tacit knowledge, to try and transfer as much tacit knowledge to explicit as possible, and where that is not possible, to link people to experts holding tacit knowledge in different areas (Agarwal & Poo, 2008; Maybury, D'Amore, & House, 2000).

Cross and Baird (2000) examined learning from 22 projects across organizations to better understand how knowledge that develops from significant experience migrates into an organization and gets embedded in an organization's memory. Along with tacit and explicit knowledge, the other types of knowledge they identify are:

3. personal relationships - seeking knowledge from trusted and capable colleagues. Agarwal, Xu, and Poo (2009) call it social context i.e. getting knowledge from social or work groups that you see yourself a part of.
4. work processes and support systems. Changing work processes is an effective means to convert individual memory into work processes. For example, when a college or a university votes in a new curriculum or comes up with a new student or faculty policy manual, then the experience and knowledge of all those working on arriving at these documents become part of the work process guiding the college or university.
5. Key products and services offered by the college or university. Geng et al. (2005) cite examples of skills of graduating students or research publications for this type of knowledge.

This is in line with Blackman and Kennedy (2009)'s recognition of knowledge as being held between individuals and collectives, within organizational processes and systems, in stock as well as in flow. Blackman and Kennedy (2009) state that the recognition of the personal yet collective nature of knowledge is leading to a consideration of the personal and sociological needs of individuals and collectives in knowledge genesis and learning. Further, they recognize the influence of political, structural and cultural organization environments on the phenomenon of knowledge and its availability and use to the organization.

Colleges and universities will need to strive for innovative knowledge in order to survive and excel within the changing face and increased challenges of higher education. Stewart (1997) classifies knowledge into dimensions of easy or difficult to replace, and low or high value added. A college or university must determine the type of knowledge it wants to invest in. For the institution to be successful, the focus must be on capitalizing difficult to replace, and high value added knowledge and skills. This type of knowledge would be fundamental to the success of teaching and research, student retention, and other financial viability goals of the university. A key challenge here would be in adequately determining whether a particular knowledge or skill is easy or difficult to replace, and of high or low value. Information documented as explicit knowledge is replaceable, the tacit knowledge in people is not. Also, when a faculty or a staff members leaves or retires, the college or university loses the social capital i.e. the sum total of all connections, and resources associated with those connections, that the person brings to the college.

Geng et al. (2005) further classify tacit knowledge of interest to colleges and universities into 2 primary domains – scholarly knowledge and operational knowledge. They say that scholarly knowledge becomes explicit when disseminated through teaching and students engaging in the learning process, publishing research, disseminating knowledge through conferences, service activities, as disciplines interact and as universities and industries collaborate. Operational knowledge is held in diverse areas such as computer services, enrollment management, admissions, research support, students services, student organizations, etc. The operational knowledge made explicit in multifunctional teams can be assessed and used to guide university operations (Nonaka, 1998; Geng et al., 2005).

2.3. Past work on KM in colleges and universities – KM priorities for universities

Whether a knowledge of interest falls within the scholarly or operational domain, universities will need to prioritize and decide on the knowledge goals they want to address when implementing KM. In a pilot survey comparing KM in Chinese versus American universities, Geng et al. (2005) got responses from the Chief Information Officers (CIOs) of 11 American Research 1 universities, and 28 Chinese universities. The U.S. universities ranked their top KM priorities as 1) libraries and learning centers; 2) institutional research; and 2) information technology. These priorities were different for Chinese Universities, whose top priorities were 1) information technology; 2) computer/telecommunication centers; and 2) scholarly information. Also, in any given college or university, the priority might be different from the point of view of administrators, faculty, staff or students, and individuals within these groups, or across different schools on campus.

However, the college or university as a whole (or specific units within them) must decide its immediate priorities when implementing knowledge management. The ranking in Geng et al.'s study shows a focus on meeting the individual knowledge-content needs of end users by focusing on libraries, technology, research and teaching.

Depending on the chosen knowledge area(s) or priority, a college or university would need to decide on the knowledge goals based on its individual needs. In Geng et al.'s study, the CIOs of American universities ranked their top needs as: 1) implementing best practices; 1) improving effectiveness; and 1) improving information relevance. Ahmadi (2012), in a study of a single Iranian university, arrived at the following functions of KM in a university (the ranking are based on the needs of the university surveyed): 1) organizational redesign strategy; 2) promoting organizational culture; 3) producing new knowledge; 4) leadership and intelligent decision-making; 5) organizational learning; 6) optimal relations with customers; 7) converting tacit knowledge to explicit; 8) creativity; 9) paying attention to its people and human resources.

Studies on KM awareness, readiness and KM initiatives have been conducted in universities spanning North America to the Middle East to Asia to Asia-Pacific. Rowley (2000) investigated the degree of readiness for KM implementation in Canadian universities. Al-Bastaki and Shajera (2012) looked at the KM readiness of the University of Bahrain. Ahmadi (2012), and Ahmadi and Ahmadi

(2012) looked at the KM initiative in Sushtar University, Iran, where KM is being utilized to improve the research output and processes. There were other Iranian studies conducted in the University of Isfahan looking at the KM infrastructure and the degree of organizational readiness (published in Persian, and cited by Matin and Kashani (2012)). Matin and Kashani (2012) surveyed faculty members from Payam Noor University and Islamic Azad University, both in Iran, to investigate whether public and private universities were ready for KM implementation. Studies have also been conducted on Malaysian universities. Mohayidin et al. (2007) evaluated the factors affecting the promotion of KM among faculty and the university as a whole in public and private Malaysian universities. Abdullah et al. (2008) looked at the degree of adoption of KM in public Malaysian universities. Arntzen, Worasinchai, and Ribiere (2009) looked at KM practices in Bangkok University. Islam, Ikeda, and Islam (2013) investigated the knowledge sharing behavior of faculty members in a department each from two public universities in Bangladesh. Tian, Nakamori, and Wierzbicki (2009) carried out surveys and case studies at the Japan Advanced Institute of Science and Technology in Japan to investigate KM situation and requirement, largely to support faculty research. Blackman and Kennedy (2009) looked at the relationship between governance and KM at the University of Canberra, Australia.

The University of Wisconsin, Oshkosh also undertook a major reform (though they didn't call it KM) in coming up with their new University Studies Program of general education. "Years in the crafting, this dramatic reform – which prioritizes the learning and skills necessary to succeed in the twenty-first century, while sparking a lifelong embrace and pursuit of civic engagement, cultural understanding and sustainability – had reignited the liberal-arts flame among faculty and staff." (Carrell, 2013).

Apart from higher education, there have been a number of successful examples and case studies of KM implementation since the 1990s across various settings and industries. Organizations that have successfully implemented KM have included the World Bank, BP Group, Buckman Laboratories, Sainsbury's, Siemens (KM Best Practices, n.d.), NASA, and many others. Many of the best practices adopted by these organizations in implementing KM can be applied to the higher education sector.

2.4. Theoretical approaches and lens

As the focus of this paper is on providing a template for implementing KM in colleges and universities, we will look at a few frameworks to guide KM implementation.

Arntzen, Worasinchai, and Ribiere (2009) propose a KM framework for colleges and universities that includes the following key enablers:

- Strong leadership; top management involvement
 - Enhanced knowledge worker environments
 - Training and education; support; research activities
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- Competence/expertise management; knowledge base
- Communication; external collaboration
- Culture – motivation; trust; rewards; incentives
- Adequate information systems and computer infrastructure
- Informal and formal networks: communities of practice; seminars; conferences; social events
- Other elements: time; resources; funding; metrics

The American Productivity and Quality Center (APQC) has a well-developed KM framework that includes the elements shown in Figure 1 below (APQC, 2014; O’Dell & Hubert, 2011). Their framework consists of 4 steps: 1) call to action; 2) developing KM strategy; 3) designing and launching KM approaches; and 4) sustaining and evolving. The figure also shows the results for each step. Cycles of continuous improvement are involved in each step. See APQC (2014) for detailed explanations of each of the steps, and sub-steps within them.

→	Call to Action→	Develop KM Strategy→	Design & Launch KM Approaches→	Sustain & Evolve→
<i>Results:</i>	Value proposition; KM Direction; Business Buy-in	KM Strategy; KM Road Map	Detailed Project Plan; Infrastructure Plan; Budget	Dynamic KM Program – embedded, valued, evolving

Fig. 1. The APQC KM Framework (O’Dell and Hubert, 2011, p. 16)

Alvarenga Neto et al. (2009) describe and analyze, what they call, the SET (Strategy-Environment-Toolbox) model, which they arrived at over several studies. They describe Strategy as the knowledge vision – knowledge as a potential to act and knowledge as a commitment to act. The strategy is based on the work of Choo (1998), who advocates 3 primary purposes for organizations implementing KM – 1) sense-making (sensing and interpreting changes, trends and opportunities); 2) knowledge-creation, that leads to new products, services and processes, providing evidence of the organization’s potential to act; and 3) decision-making, which results in the organization’s commitment for action. Alvarenga Neto et al. (2009) conclude that KM implementation should be developed around strategic organizational issues, and involve key knowledge activists in the organizations. These are mainly middle-managers composing a governance committee supported by top administration. They play a key role in translating the desire and strategy into implementation and action. Environment is described as the enabling context for knowledge creation, or ‘ba’ (Nonaka & Konno, 1998). Alvarenga Neto et al. (2009) apply their model in the context of Brazilian organizations and conclude that within KM, what is managed is not knowledge itself, but only the context where knowledge emerges and is socially constructed. Toolbox is the technology tools and managerial practices used to drive the organizational knowledge strategy into action. Figure 2 below summarizes the SET KM Model.

Strategy	Environment	Toolbox
	Enabling context – ‘Ba’ and enabling conditions (middle-managers’ leadership)	KM umbrella – managerial practices and IT tools
1. Sense-making	<ul style="list-style-type: none"> ▪ tolerance to ‘honest mistakes’ 	<ul style="list-style-type: none"> ▪ Intellectual capital tools and processes
2. Knowledge-creation – organizational learning and unlearning ➤ potential to act	<ul style="list-style-type: none"> ▪ creation of meeting and sharing organizational spaces 	<ul style="list-style-type: none"> ▪ Competitive intelligence, environmental scanning and market research
3. Decision-making – bounded rationality ➤ commitment to act	<ul style="list-style-type: none"> ▪ narrow idea about the meaning of ‘productive work’ ▪ care, trust, commitment, lenience in judgment (there is no loss of status for not knowing everything) ▪ openness to new ideas and innovation ▪ creative chaos ▪ autonomy and empowerment ▪ organizational culture ▪ physical layouts 	<ul style="list-style-type: none"> ▪ Communities of Practice ▪ Organizational Learning Initiatives ▪ Spaces for face-to-face interaction (Knowledge Cafe, Knowledge Happy Hour!) ▪ Information Management / Information Systems ▪ Information Technology - Content Management

Fig. 2. The SET KM Model

Based on the SET KM Model, Alvarenga Neto et al. describe a 7-step process for KM implementation:

1. Epistemological view – what is the organization’s understanding of knowledge?
2. Constitution of multidisciplinary committee for the governance of the KM process, with direct report to the organization’s CEO
3. Identification and mapping of macro-knowledge based on the internal and external environment (Knowledge-map or K-map), which includes macro-processes and strategy
4. Deployment of K-map in all organizational areas (directorships) into more specific levels (knowledge taxonomy)
5. Emphasis definition – knowledge retention, knowledge sharing or knowledge creation
6. Selection of IT tools and/or managerial practices; definition of metrics
7. Implementation of the pilot project

Milton (2013) recommends 5 steps for KM success: 1) assessing the current state; 2) building a business-led strategy; 3) developing a draft KM framework; 4) creating an implementation plan; and 5) delivering some early pilots.

Theoretical Lens

Figure 3 below shows O’Dell & Grayson (1998)’s KM framework for best practice transfer. It has four sequential stages – plan, design, implement and scale-up. The value proposition or the

need for KM lies at the heart of the model. The success depends upon the enabling environment provided by culture, infrastructure, technology and measures.

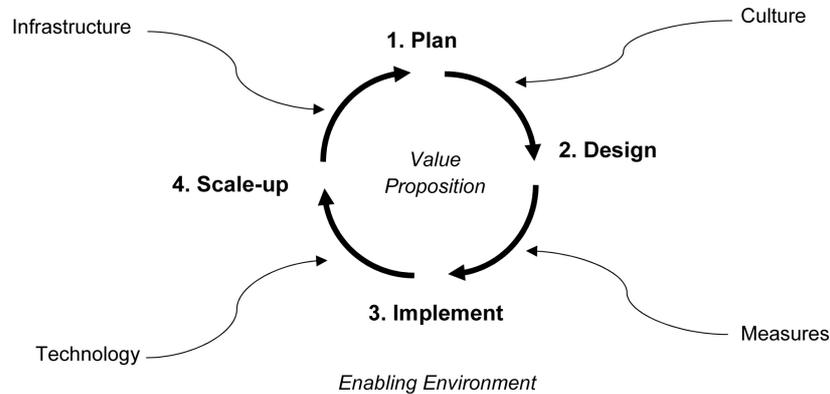


Fig. 3. O'Dell and Grayson (1998)'s framework

As O'Dell & Grayson (1998)'s framework is the simplest (compared to other frameworks such as the SET model of Alvarenga Neto et al. (2009) and the APQC (2014) KM model), we use it as a theoretical lens to guide this study. We are also guided by the APQC KM model (APQC, 2014; O'Dell & Hubert, 2011). We adapt these frameworks in a college and university context, and arrive at recommendations for KM implementation in such a setting.

While we do not have a separate methodology section, the steps were arrived at by the co-authors over 7 months (Oct 2013 to May 2014) through a series of iterations, refinement, feedback, and consolidation. The primary criteria was to make them actionable, feasible and useful for universities to adopt in initiating KM.

3. Steps to Initiate the Knowledge Management Process

We will now outline the steps that a college or university can follow to start the KM process. The steps listed are iterative rather than sequential. As you move to the next step, there might be the need to revisit and revise previous step(s). The steps are not meant to be prescriptive, but rather a possible way to get started with KM. The need to communicate and educate is common and necessary for every step. Constant access and interaction between the KM team(s) and all stakeholders must be enabled and functional at all times. The steps are classified into the 4 phases of plan, design, implement and scale-up, as per O'Dell & Grayson (1998)'s framework. There would be a separate dedicated team needed for each of these four phases (though members could be common or different across the teams). For each step, the recommended mechanism for achieving the step is listed, along with the expected outcome of the step.

PLAN (facilitated by KM planning team)

Step 1. Find a champion from top administration; form a KM planning team

A lot of times, the need for knowledge management (or strategic transformation, overhaul, etc.) stems from a perceived crisis, and the opportunity arising from such a crisis. This crisis may come from the larger macro environment affecting the university – an accreditation body threatening to withdraw accreditation, student admission or retention rates going down, staff / faculty not having had raises, etc. With KM, the opportunities might be to retain students, achieve student learning outcomes, achieve excellence in research or teaching, enable greater connection and collaboration between faculty members across the campus, or to enhance collaboration between different departments. Effective KM can lead to better decision-making capabilities, reduced time to develop products such as curriculum or research outputs, improved academic and administrative services, reduced costs (Omerzel, Biloslavo, & Trnavcevic, 2011), increased productivity (Arntzen, Worasinchai, & Ribiere, 2009), improved efficiencies and improved quality of output.

Irrespective of whether the College President, Provost or Dean learns of KM from news outlets or its success in other organizations, or a faculty or staff member brings it to the notice of the administration, there needs to be a champion of KM in top administration. This can happen once s/he is convinced that the status quo in the University needs to change, and that KM can provide a solution.

Top administration support is crucial to drive the idea of KM college-wide and to provide the support, resources and incentives for KM. The administration can also help put together a planning team in place that can drive the KM process forward. Some budget, financial and other resources may need to be provided to the team and its work. This team may be top-down (with members nominated by the college administration), bottom-up (with members emerging from individual schools) or a mix of both. When selecting members for such a team, it is crucial to include key stakeholders from different schools and constituencies. The KM process should be driven by people who are likely to be most affected by the results – the faculty and staff (either college-wide or within a school or unit, depending on the scope of KM). It should also have representation from administration, as well as students. Rogers (1995)' Diffusion of Innovation theory classifies people into innovators, early adopters, the early majority, the late majority and laggards. Since KM is all about change management, it is helpful to include innovators and early adopters (those who are more enthusiastic about change) in the team. The team should have a good facilitator throughout, who can be a person trained in KM or change management, someone from the Center for Excellence in Teaching or the college Assessment Committee. The facilitator must have the skills to get groups to brainstorm together in retreat-like settings.

One thing to note is that this should be a facilitation and coordinating team. Rather than making and imposing decisions, its job is to bring together all the people in the KM process. All stakeholders affected by the results of the KM process (faculty, staff, students) must have a say, and choice

of participation in the process.

- *Mechanism*: The primary mechanism will be conversation about KM with top administration, and subsequent consultation for team formation involving various stakeholders.
- *Outcome*: The outcome is buy-in for KM, and support and resources in terms of people and budget. By the time this step ends, a facilitation and planning team (including facilitator, faculty, staff and representatives from administration and students) should be in place.

Step 2. Identify KM goals and priorities

The KM planning team will hold consultations with heads of different units or schools across campus, who will inform all their constituents of upcoming retreats and encourage participation. The planning team will then schedule the time and agenda for 2-4 half-day retreats spread over a semester during times that work for the stakeholders involved. The idea is to get people together to participate in a shared process. If possible, video or audio conferencing options must be built in for those who cannot participate in person to connect remotely. People who choose not to come to the scheduled retreats are self-selecting themselves away from the process, but they should have a chance for input at various points. Thus, all stakeholders – whether faculty, staff or students must be reached out to – in the form of surveys, focus groups or email discussions, informing them of the work done in retreats and inviting comments or feedback, or their participation in subsequent retreats. Even if the majority of the work is done by faculty and staff, there could be student representatives, or separate focus groups with students.

The primary purpose of the retreats (enabled by the facilitator) must be to identify KM goals and priorities. In doing so, three sub-steps need to be addressed, which could each be the agenda for a single half-day retreat:

- A. Identify perceived crisis and/or opportunity – why do we want to manage knowledge?
- B. Align KM goals with university (or school/department) goals
- C. Identify and prioritize the critical knowledge that you need to manage (O'Dell & Hubert, 2011, pp. 23-31)

At some stage during the process, the team, the college administration and the people involved in the retreat either self-select or decide on the school or unit to involve first for a KM pilot. A unit that has a reputation for being flexible, innovative, technology-savvy, and with a thriving knowledge sharing culture, and/or a high rank in the field (as compared to other schools or units) is a good choice for a pilot site, as it can show early successes, and serve as a model for the rest of the college or university.

- A. In the first retreat, the participants will consider the college need that is addressed by KM.
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Why do we want to manage knowledge? What do we hope to get out of it? The strategic priorities will be different for each institution, and will also be different at different times in the life of a single institution. We discussed knowledge priorities under literature review in prior works such as Geng et al. (2005) and Ahmadi (2012). Arntzen, Worasinchai, & Ribiere (2009, p. 134) list KM outcomes for higher education and map them to initiatives for their realization. Different KM researchers have identified different phases of the KM cycle (Dalkir, 2011), which might constitute the knowledge priority or knowledge outcomes for an organization. Some of these are addressed by Choo (1998) and incorporated in the SET model discussed earlier. These can be broadly classified into the three priorities listed below:

- a. Creating a conducive environment (ba) for knowledge capture and creation.
 - i. *Knowledge acquisition or sourcing* (sense making, as per Choo, 1998): Here, the internal or external environmental is continuously sensed and knowledge that is useful for the college is acquired. This includes information on new programs and degrees being launched by peer institutions, the recommendations of accreditation bodies, the opportunities provided by collaborations with other institutions, changes in the economic environment leading to more or less students entering college, etc.
 - ii. *Knowledge creation* is one of the most important priorities for universities. As discussed above, one might want to focus on knowledge related to research output or teaching excellence or operational knowledge. Conducive environments such as working groups, meetings, collaborations, brainstorming sessions, seminars, retreats must be regularly held for knowledge creation.
 - iii. *Knowledge capture*. The compiled knowledge must be captured in actionable forms such as faculty policy manuals, student guides, brochures, videos, audio recordings, emails, etc.
 - iv. *Knowledge organization and storage*. Knowledge must be organized such that it is found when needed. Computer-based systems, intranets and content management systems play a major role here. Academic libraries and institutional repositories are important places to house knowledge.
 - b. Making knowledge sharing a natural and defining aspect of the college
 - v. *Knowledge sharing, transfer and access*. Knowledge sharing is one of the most important purposes of KM. Connections must be built both for physical interactions (lunch time talks, meetings, conducive physical spaces, etc.), as well as physical and online interactions (working groups, communities of practice, etc.). Best practices and lessons learned must be continuously shared.
 - c. Using, evaluating and applying the knowledge (decision making, as per Choo, 1998)
 - vi. *Knowledge application and use* is the primary purpose of creating and sharing knowledge. If all the effort in managing knowledge does not lead to adequate use, the effort is wasted. The use would be at different levels – individual, group or team based, department based, and college-wide. The way the knowledge is stored and organized, and made available in a timely manner, will play a major part on how it is used. E.g. Course evaluations by students should be made available to faculty early enough, so that they can use the student feedback when preparing the next iteration of the course. Knowledge use would be different for faculty, staff,
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students, college administrators, and would be different across schools or units.

B. Once there is some clarity on the need to manage knowledge and some areas of focus, the second retreat can concentrate on aligning KM goals with the goals of the university (or the goals of a specific school or department, if KM implementation is to be limited to that unit). Most colleges and universities have explicitly stated longer term vision statements, and more specific mission statements listed on their websites. These are stated goals of the university – the reason for its existence. Many colleges would include learning or knowledge as part of these statements. Along with these, there would be immediate (applicable for 1-5 years) priorities for the college. It could be in the area of research as it is often linked to the reputation of a school or college – increasing research output by getting faculty to publish more; or raising the quality of research output; or providing greater access and dissemination of published articles by building or sustaining an in-house institutional repository to provide open access. It could be to provide greater support for teaching strategies, approach or classroom research. It could be to identify areas of growth for the college e.g. at the moment, there are growing areas like digital humanities, big data and information visualization or health informatics. It could be to survive and grow in an increasingly difficult economic climate by increasing student enrollment, preventing dropout rates, or looking for areas of additional revenue such as online education, new programs, degrees or certificates, or use of physical spaces such as buildings, parking or labs for revenue.

Many of these needs might co-exist. A college or university would need to prioritize them for the shorter term or longer term, and map the KM goals accordingly to it. These priorities would be different for different types of sizes of colleges or universities. They would also be different for a given institution at different times in its life and history. The participants of the retreat must seek such an alignment of KM priorities with college priorities.

C. Depending on the degree of progress in previous retreats, the participants in the third or fourth retreat could work to identify and prioritize the critical knowledge that it needs to manage. They need to identify and discuss what is meant by knowledge, as it is impossible to manage something that is not understood (Fahey & Prusak, 1998; Blackman & Kennedy, 2009). See the earlier discussion under the literature review on identifying the type of knowledge that we're seeking to manage. The focus here is to identify that critical knowledge that will serve the strategic goals of the university. For example, if student retention is a strategic goal, what knowledge is critical to ensure this? "Building KM capabilities that connect employees and capture and share information is important, but being able to articulate specifically *what* knowledge needs those activities and approaches will address will lead to a clear call to action and more meaningful results. KM creates value only when it enables the creation and flow of the truly critical knowledge." (O'Dell & Hubert, 2011, p. 23). At a higher level, the knowledge identified can be one of two types – operational versus scholarly (Geng et al., 2005), but could be further sub-divided based on feedback from participants. The role of tacit versus explicit knowledge must also be discussed. The identification of knowledge should help in developing the right KM strategy in the setting of KM goals and

priority for the short term and the long term. For example, the tacit knowledge of faculty can be tapped by connecting people together for knowledge sharing. Explicit knowledge in the form of resources and answered questions can be made available via technology.

This process must end with an identification of members volunteering to take on or participating in further parts of the work, which must include the technology folks as well.

- *Mechanism*: Thus, the second step of the KM process is enabled by a series of retreats involving various stakeholders.
- *Outcome*: An outcome of this process is the identification of need, priority areas (e.g. student retention, research output, etc.) and the critical knowledge that the university is seeking to manage. A pilot site (such as a school or department within the university) should also be identified for KM implementation. At this stage, the planning team must give way to a KM design team. It could consist of either the same members who had facilitated the retreats, or new members could be roped in from retreat participants (or those with experience in KM design). The design team must have representatives from the university-wide Technology team, as technology (along with non-technology tools) will form a crucial backbone in enabling KM.

DESIGN (facilitated by KM Design team)

Step 3. Determine your current state in the priority areas identified (capability/readiness assessment)

The design team that is formed will now begin the task of assessing if the enabling context or “ba” (Nonaka & Konno, 1998) exists and to what extent i.e. the degree of readiness or capability of the college or university to implement KM. You want to plant a seed. You need to assess if the soil is fertile, if there is the right temperature, if there is light, etc. Thus, it is the process of trying to understand your current state before you can move ahead with filling the gaps in your knowledge or knowledge flows. To do this, the team can employ a number of mechanisms – primarily surveys, interviews and focus groups. The focus of these must be to answer questions related to four areas primarily – people, culture, processes and information technology. For instance, questions based on degree of agreement using a Likert scale can be developed where faculty and staff can be asked questions pertaining to the following:

- A. People – faculty, staff, administration (awareness of KM, what it means and what it can bring to them; individual intention to be involved in the KM process; expectancy – motivation, performance and effort i.e. how much effort am I willing to put into this - Razi and Karim, (2011); top management openness and support/resources for new ideas).
 - B. Culture (the university encourages and facilitates knowledge sharing; a climate of openness and trust permeates the university; student value creation (or research output, or another priority
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area) is acknowledged as the major objective of KM; flexibility and desire to innovate drives the learning process; faculty, staff and administration take responsibility for their own learning – adapted from O’Dell & Grayson, 1998, p. 229). Omerzel, Biloslavo, & Trnavcevic (2011) define organizational culture as a set of explicit and implicit rules of what is and is not acceptable behavior in an organization, influenced by core values, norms and underlying assumptions. Values and beliefs of university stakeholders i.e. administrators, faculty, staff, students and trustees are thought to greatly influence decision-making processes, and shape individual and organizational behaviors at universities (Bartell, 2003; Omerzel, Biloslavo, & Trnavcevic, 2011). The Competing Values Framework (CVF) by Quinn and Rohrbaugh (1981) identifies 4 types of organizational culture - 1) hierarchy (well-structured and formal organization with formalized rules and procedures), 2) market (goal-oriented organization that operates by market rules), 3) clan (tightly connected organization that values teamwork, and people take care of each other; mentorship plays an important role) and 4) adhocracy (creative and dynamic organization that enables innovations, growth and gaining of new resources). Empirical studies have found a positive correlation between the various types of organizational culture and KM processes (Omerzel, Biloslavo, & Trnavcevic, 2011). The design team would need to identify the type of culture the university (or the pilot site in question) exhibits, and align its KM approach accordingly. The team should also determine if the university (or site) has a pro-sharing or an anti-sharing culture, or one in between.

- C. Processes – questions to determine if any prior KM implementation is in place or to identify the areas that the university needs to work on (a sophisticated and ethical intelligence gathering mechanism has been developed; knowledge gaps are systematically identified and well-defined processes are used to close them; all faculty and staff are involved in looking for ideas in traditional and non-traditional places; the university has formalized the process of transferring best practices, including documentations and lessons-learned; tacit knowledge i.e. what employees know how to do but cannot express is valued and transferred across the university – O’Dell and Grayson (1998, pp. 227-228)).
- D. Information technology (technology links all members of the university to one another and to all relevant external public; technology creates an institutional memory that is accessible to the university as a whole; technology brings the university closer to its students; the university fosters the development of human-centered IT; technology that supports collaboration is rapidly placed in the hands of faculty and staff; available information systems are real time, integrated and smart – O’Dell and Grayson (1999, pp. 229-230)).

APQC has also developed a KM capability and assessment tool for organizations to validate and target their programs’ issues, gaps and strengths (O’Dell & Hubert, 2011, p. 37) which can be applied to colleges and universities. Other instruments (e.g. by Moffett & McAdam, 2006; Al-Bastaki & Shajera, 2012) are targeted to the university context.

- *Mechanism*: A readiness assessment can be achieved through a survey, interview or focus groups to determine the KM capabilities relating to people, culture, processes and technology, etc. The design team will design, pre-test, pilot and then send out the survey to all faculty and staff in the site chosen for the pilot.
- *Outcome*: The outcome will be a relative rating for each priority area, and an overall assessment of the state of KM readiness of the pilot site.

Step 4. Determine approach to align with culture and capability to enable knowledge flow

The categories of approaches vary by how much they focus on explicit and tacit knowledge and how much human interaction or facilitation is involved (O'Dell & Hubert, 2011). The university will likely need a combination of KM approaches. "There is continuous tension and balancing act between the need for IT and the need to focus on people. We believe it is best in this balancing act to lean to the people side." (O'Dell & Hubert, 2011, p. 48).

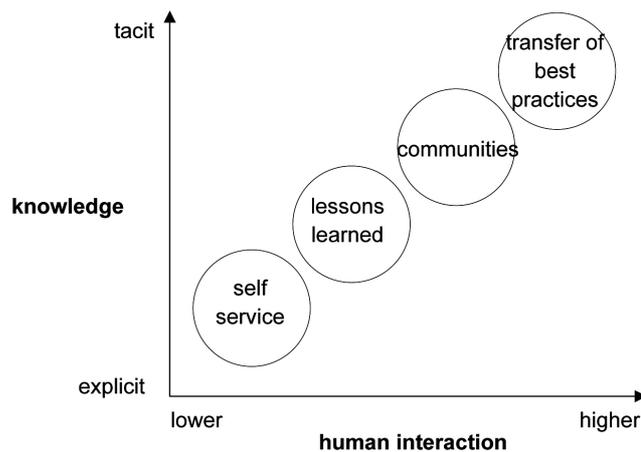


Fig. 4. Categories of KM Approaches (O'Dell & Hubert, 2011, p. 46)

Figure 4 shows the categories of KM approaches that a university can adopt, depending on how much it wants to focus on explicit versus tacit knowledge, or lower versus higher human interaction, as determined by the outcome of the readiness assessment exercise. A college or unit with a higher knowledge sharing culture would want to focus on higher human interaction and tacit knowledge, as opposed to one with a lower sharing culture (that might limit itself to explicit knowledge or lower human interaction, until the college is ready for greater knowledge sharing).

Self-service is a technology-focused approach that allows users to self-serve information and to locate knowledge. These tools can vary from intranet or knowledge portals to emails/discussion boards, etc. (O'Dell & Hubert, 2011). See Agarwal and Islam (2014) for a complete listing of

currently available IT tools (including social media and Web 2.0 tools) that can be applied.

Lessons learned is a systematic approach using tools that help faculty and staff capture experience-based knowledge, share them, and then reapply them to relevant situations (O’Dell & Hubert, 2011).

Communities of practice and networks consist of faculty and staff who come together face-to-face and virtually around an issue, discipline, or body of knowledge to share and learn from one another. They tend to be formal, have a common goal and a desire to share experiences, insights and best practices. (O’Dell & Hubert, 2011). Most universities have thriving committees that carry out the major work of governance. These can be further strengthened to make them open and transparent (e.g. by allowing interested non-members to connect remotely and having access and a voice on documents produced by the committees even before they are formalized and shared). Communities of practices can be used to enhance research and teaching across discipline boundaries by promoting faculty from different schools to come together and possibly collaborate on areas of interest.

The facilitated transfer of best practices (O’Dell & Hubert, 2011) involves sharing and transferring successfully demonstrated practices and processes between units across the campus.

Agarwal and Islam (2014) have put together a complete listing of tools that apply to different stages of the KM process – knowledge capture and/or creation; knowledge sharing and dissemination; and knowledge application and reuse. A college or university implementing KM can pick and choose among the suite of approaches and tools that best apply to it based on its readiness assessment. Along with tools, the design of open and collaborative physical spaces should also be an important consideration in enabling natural environments for faculty and staff across the university to connect and share knowledge in informal ways.

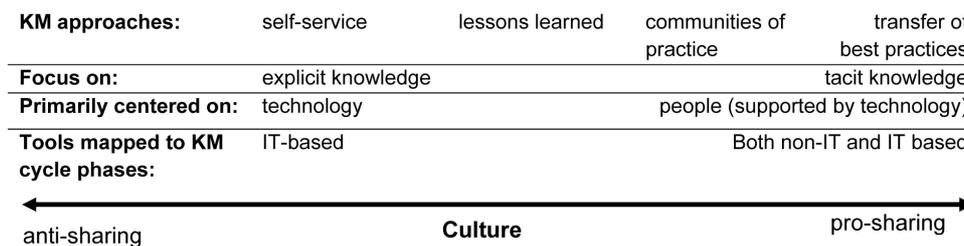


Fig. 5. Alignment of approaches and tools to university culture

Figure 5 above shows an alignment of KM approaches (O’Dell & Hubert, 2011) to IT and non-IT based tools (Agarwal & Islam, 2014) to the continuum of knowledge sharing culture prevalent in the college or university.

- *Mechanism*: This work of aligning KM readiness and culture to KM approaches and tools will be carried out by the design team, in consultation with all stakeholders of the pilot site. The process of aligning would enable higher acceptance and adoption, as it will be in tune with the prevalent culture.
- *Outcome*: The outcome will be the approaches and tools that the faculty and the staff at the pilot site vote to adopt based on the assessment of alignment.

Step 5. Develop measures of success

“A measurement system provides a framework to present a common understanding of the current situation, what needs to be done to improve, and how progress is going to be measured and rewarded.” (O’Dell & Hubert, 2011, p. 152). Now that the approaches and tools are agreed upon, the stakeholders in the pilot unit (assisted by the KM design team) need to brainstorm and agree on how they would measure success. The involvement of all faculty and staff is crucial in this process, as they are best enabled to determine what success would mean to them and the school. These measures must be aligned to the KM goals that were determined in Step 2.

The portfolio of KM measures can be divided into three basic categories (O’Dell & Hubert, 2011, p. 145): activity measures, process efficiency measures, and university performance measures and outputs. The activity measures are measures of involvement and the degree to which the faculty and staff use and participate in KM. The process efficiency measures determine if critical knowledge is flowing where it needs to for it drive the strategic goals of the university or school. The university performance measures and outputs evaluates the performance of the pilot site’s operations and activities. They will provide the link from the KM program efforts to the organizational results (O’Dell & Hubert, 2011). Both formative (measure as you go) and summative (outcome) measures need to be developed, ensuring that intangible measures such as social cohesion, job satisfaction, work-life balance, happiness, etc. also find a place, along with more tangible measures such as student retention, research productivity, increased enrollment, etc.

A list of measures alone won’t do the university any good. It will “need processes and accountability for collecting, organizing, reporting, and acting on the measures to improve the KM program, as well as to provide the basis for funding” (O’Dell & Hubert, 2011, p. 152). These must be incorporated in the action plan (Step 6).

- *Mechanism*: The design team and the faculty/staff of the pilot site must come up with these measures in one or more half-day retreats.
 - *Outcome*: The outcome of this step is a listing of measures.
-

Step 6. Create action plan and get faculty/admin buy-in and resources

Once the pilot unit (helped by the KM design team) has agreed on approaches, tools to adopt, and the measures of success, an action plan and timeline needs to be developed and proposed to the Dean and the university Administration for budget and resources. The action plan must include the following: 1) key phases/steps/timeline; 2) the people involved in each implementation phase; 3) the plan for the continuation of communication and interaction with all stakeholders; 4) resources, technology infrastructure and budget; 5) success measures and timeline for measurement; and 6) the owner (someone who is responsible) for each major component or deliverable from the design phase.

- *Mechanism:* The mechanism to achieve this step will be meetings of the design team with administration; update to schools.
- *Outcome:* The outcome will be the actual action plan including budget, owners and timeline. This step must end with the constituting of a KM implementation team (which should have faculty and staff that were involved in design, along with representatives from the university administration, as well as technology folks).

IMPLEMENT (facilitated by KM implementation team)

Step 7. Launch a pilot and provide support within a school a department

Once the implementation team is in place, it understands the action plan, and has the requisite budget and resources, it can begin the work of KM implementation. A pilot implementation of one or more phases of the action plan can then be launched in the pilot site. E.g. If the approach is to build a community of practice, the role of the implementation team will be to help participants set objectives, learn to communicate, learn from each other, and so on – everything that will lead to an increased in knowledge sharing. “This learning-to-learn process is the most critical part of implementing a network-oriented effort.” (O’Dell & Grayson, 1998, p. 201). In the next phase, the team will also work towards open spaces and technology infrastructure that can help greater interaction between faculty and staff of the pilot site and beyond. All these will be launched in a phased manner by the implementation team, in consultation with the stakeholders of the school or department chosen as the pilot site for KM implementation. Throughout, the implementation team will provide support, observe, measure and learn.

In this launch process at the pilot site, it is important to do everything possible to achieve early visible results – within at most six months (O’Dell & Grayson, 1998). This will help transfer the enthusiasm about KM in other schools and units on campus.

- *Mechanism:* This is achieved through launching the KM program and providing support.
 - *Outcome:* The outcome is the early results, and measures of success.
-

Step 8. Capture success stories and publicize early results

Based on the measures of success, the implementation team (supported by faculty and staff of the pilot site) needs to capture the success stories. If the KM launch has gone well, the enthusiasm will quickly spread across the campus. However, there has to be a systematic process of capturing best practices and lessons learned, codifying (converting from tacit to explicit) the first set of good experiences – in the form of text or videos, and using the participants and star performers as missionaries and coaches for future scale-ups of the KM project either in the same unit, or in other units across the campus (O’Dell & Grayson, 1998).

The KM implementation team must organize their learnings from the pilot, use the lessons learned to create an expansion and scale-up strategy, identify an entity that will guide, support, and monitor KM on a university-wide scale (O’Dell & Grayson, 1998).

- *Mechanism*: The mechanism for best practice capture includes interviews, surveys, videos, storytelling, etc. The dissemination mechanisms might include newsletters, talks, presentations, storytelling, etc.
- *Outcome*: The outcome is a documentation of learnings from the pilot, and publicity, and the plan to continue, stop or expand KM. If the plan is to expand, the contours of a university-wide KM team (which should include members of the pilot implementation team, but enlist other stakeholders across the college or in other schools/departments) need to be put in place.

SCALE-UP (facilitated by the university KM team)

Step 9. Use knowledge gained to realign strategy with university objectives

The university-wide KM team will now revisit the initial KM goals (in alignment with the university goals), and develop general college-wide guidelines for KM implementation. Based on the guidelines, each school or unit implementing KM would need to develop their unit-specific implementation, depending on their specific needs or differences.

- *Mechanism* : This is achieved in meetings of the university-wide KM team with higher administration, and other stakeholders from different schools and units on campus. Different schools will need to vote and approve the college-wide guidelines.
- *Outcome* : The outcome is college-wide guidelines, and templates for department-specific KM initiatives (based on the success of the pilot).

Step 10. Scale up to other units and repeat

It is now time to figure out how to harness the engine of KM to turbo-power (O’Dell & Grayson,

1998) the entire university. With a successful pilot, university-wide guidelines and a KM team and infrastructure, the success of KM in one unit can be replicated to other units in a phased manner. One thing to note is that the culture and capability in other units may vary from unit-to-unit or from school-to-school, and might be different from that of the pilot site. The KM approaches and tools need to be chosen accordingly.

- *Mechanism*: Go back to Step 2.
- *Outcome*: The outcome is the need, priority and team(s) of the sites for the next expansion of the university-wide college plan.

Once KM has been implemented across the university, and becomes embedded in the processes and culture of the university, the university could work on ways to expand the benefits of KM to interfacing with or between students, and across other entities outside the university such as alumni, government, funding agencies, and other partner universities. Ranga and Etzkowitz (2013), in a recent work, introduce the concept of Triple Helix Systems of Innovations as an analytical framework that synthesizes the key features of university-industry-government (Triple Helix) interactions into an ‘innovation system’ format. The entrepreneurial university is central to Triple Helix that takes a pro-active stance in putting knowledge to use and in creating new knowledge (Stanford University, 2013).

4. Theoretical framework and Discussion

Summarized below are all the ten steps for successful KM initiation in a college or university, the mechanism for achieve each step, and the outcome of the respective step. It must be noted that communication and interaction between the KM team(s) and all stakeholders is a necessary pre-condition throughout – before, during and after every step.

Table 1. Ten-step KM Initiation Plan for Colleges and Universities

	<i>Step</i>	<i>Mechanism</i>	<i>Outcome</i>
PLAN (KM planning team)	1. Find a champion from top administration; form a KM planning team	Consultation for team formation involving various stakeholders	Buy-in for KM; support and resources; planning team
	2. Identify KM goals and priorities <ul style="list-style-type: none"> • Identify perceived crisis and/or opportunity • Align KM goals with university / dept. goals • Identify and prioritize the critical knowledge that you need to manage 	3-4 retreats involving stakeholders	Identification of need, priority areas, critical knowledge; pilot site chosen; design team (including IT)

	<i>Step</i>	<i>Mechanism</i>	<i>Outcome</i>
DESIGN (KM design team)	3. Determine your current state in the priority areas identified	Survey, interviews, focus groups	Relative rating for each priority area
	4. Determine approach to align with culture and capability to enable knowledge flow	Meetings / discussions based on survey results	Decision on approaches and tools for pilot site
	5. Develop measures of success	1-2 retreats	List of measures
	6. Create action plan and get faculty / admin buy-in and resources	Meetings; update to schools	Action plan; KM implementation team
IMPLEMENT (KM implementation team)	7. Launch a pilot and provide support	Launch; support in pilot site	Early results; Measures of success
	8. Capture success stories and publicize early results	Interviews, surveys, videos, storytelling; newsletters, talks, presentations	Documentation of learning; transfer of best practices; university KM team
SCALE-UP (university KM team)	9. Use knowledge gained to realign strategy with university objectives	Meeting with administration; unit meetings to vote	University-wide guidelines; unit-specific templates
	10. Scale up to other units and repeat	Go back to Step 2.	Need, priority and team(s)

A college or university will be able to take these steps and get started with KM. In Figure 6 below, we take O'Dell and Grayson (1998)'s framework and combine them with the 10 steps to initiate KM in a university.

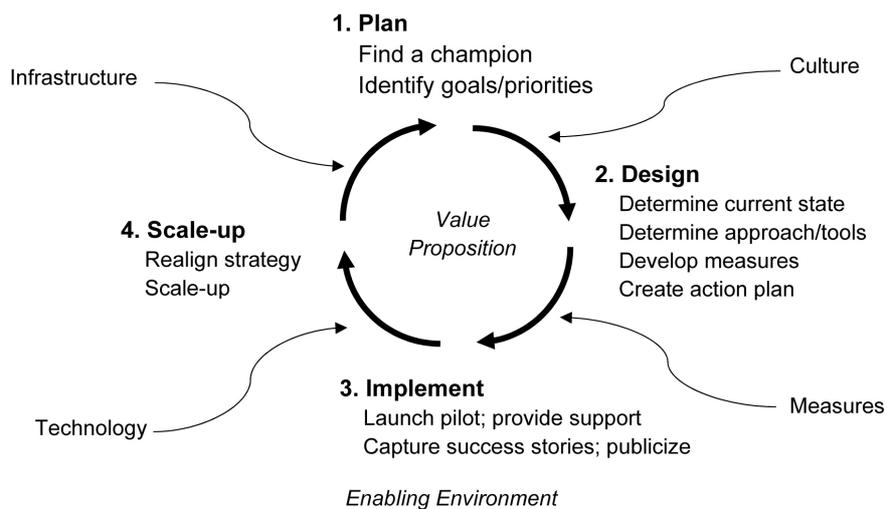


Fig. 6. Framework for initiating KM in a College or University

5. Conclusions and Implications

We have proposed a series of steps and a framework for colleges and universities to get started with knowledge management. The paper provides an understanding of what KM is, its value to the university, and how it can be achieved in a step-by-step manner, keeping the structure and constraints of a university environment in mind. One thing to be noted is that some people might be averse to the term 'knowledge management'. The term itself is not important here, but what it enables. In these cases, the college or university initiating KM might want to use other terms such as transformation, change, reform, overhaul, etc. to achieve the same results.

Even if the higher administration and various stakeholders in a university might have heard of KM, they might not be clear as to how to go about initiating and implementing it. This difficulty is compounded by more than 3 decades of research and case studies in KM that are spread across the literature. Moreover, most of KM literature and case studies pertain to for-profit business organizations, with little work that is directly applicable in a university and academic context. For university leaders wanting to know more about KM, trying to sieve through and identify what is practical and relevant is extremely difficult. This paper should help university leaders, faculty and various stakeholders simplify and make sense of KM, and get them started in the direction of KM design and implementation.

The paper has two major limitations: First, each of the steps, while simplified, has a huge body of work behind it. The college might still want to get a KM expert or facilitator to enable the success of each step, while keeping the process faculty-and-university-owned. Second, this paper is based on the literature and the experience of the two co-authors in teaching and researching KM in their respective schools. The steps and the framework will need to be applied in actual university settings to see if they actually work out as intended.

However, the proposed steps are based on prior studies and frameworks that have been validated in various organizational contexts. Thus, excepting minor tweaks, the steps should serve as a valuable guide for colleges and universities to get started with KM. They have been designed such that colleges or universities of various sizes, or units or departments within them, could successfully initiate KM by following them. The explication of the teams, mechanisms and outcomes for each step make it very easy for people working on KM in the university to determine the success of each step and to ensure they are ready to move to the next step.

The study should be useful for the top administration, deans, faculty and staff in a university desiring to effect change. While the steps and framework have been written from the point of view of universities, they can be applied in other educational settings such as libraries and archives, and also beyond education to other organizations. Faculty teaching KM would find this paper extremely useful in helping students comprehend a series of steps for KM initiation. Researchers and doctoral students working in the area of KM, and of KM in academia, would benefit from the findings

and framework proposed in this paper.

Future work will include taking the steps and the framework and applying them in specific academic contexts for KM initiation. Each step of the process can be further investigated to bring out further details of the variety of tools, mechanisms and case studies that can serve as guidelines to study and enhance each step. Finally, the steps listed in this paper can be modeled and applied to other settings outside of academia.

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