A Case for Personal Knowledge Management in the Information Systems Curriculum

Alan T. Burns

aburns@cs.depaul.edu

School of Computer Science, Telecommunications
and Information Systems (CTI)
DePaul University
Chicago, IL 60604

Thomas N. Janicki

janickit@uncw.edu

Management Information Systems
University of North Carolina Wilmington
Wilmington, NC 28403

Abstract

One of the goals of the MSIS (Master of Science in Information Systems) 2006 curriculum model is to prepare students for workplace realities upon graduation. The IT workforce of the future will be comprised of knowledge workers who must be capable of managing multiple and diverse information streams to enhance their knowledge. This paper argues that Personal Knowledge Management (PKM) tools and techniques should be incorporated into the graduate IS program. The three primary benefits are a) better preparation of students for IT work, b) more effective employees for the IT field, and c) a more effective learning experience for students.

Keywords: Knowledge Management, Personal Knowledge Management, IS Education, IS Curriculum.

1. INTRODUCTION

In response to evolutionary changes in the field of Information Technology (IT) and Information Systems (IS), a committee was established jointly by AIS and ACM to work on revising and updating the MSIS 2000 curriculum. The new curriculum model, MSIS 2006, according to Gorgone et al (2005), "needs to evolve to a much richer and integrated level of sophistication that closely reflects the rapidly changing infrastructure and technology environments our graduates will face upon graduation"

The new model places increased emphasis on advanced topics globalization, business processes, digitization, Human-Computer Interaction and emerging technologies (Gorgone et al., 2005). The end result is a larger program, now 36 units (12 courses) compared to MSIS 2000 (30 units or 10 courses).

This expansion represents a greater burden to IS educators who must continually upgrade their skills to keep pace with practitioners and on occasion, their students. The burden is also on IS curriculum designers who will face the problem of compressing more material into roughly the

same program. This trend is likely to continue.

The purpose of this paper is to discuss the promise of the emergent field of Personal Knowledge Management (PKM) as an aid to IS educators confronted with these challenges. PKM essentially refers to processes an individual performs to integrate new information into his/her existing knowledge base, or "a system designed by individuals for their own personal use, to help the individual manage the information explosion in a meaningful way" (Frand & Hixon, 1999).

Intuitively, introducing PKM concepts into the IS curriculum should serve several complementary purposes. Students who manage their personal knowledge will be better prepared for the realities of IT work upon graduation. They will be able to manage the problem of information overload, i.e. monitoring multiple and diverse information streams. During their academic career, PKM should also improve the rate that prior coursework material can be recollected, thereby accelerating understanding of new content. PKM may reflect learning in the 21st century more closely than traditional learning models.

The paper is organized as follows. The following section distinguishes some common terms and concepts associated with PKM. Next, background on some PKM tools is provided, along with a discussion of the personal experiences with introducing them in the classroom. Finally, some possible approaches to incorporating PKM into the MSIS 2006 curriculum are highlighted.

2. WHAT IS PERSONAL KNOWLEDGE MANAGEMENT (PKM)?

Personal knowledge management is a relatively obscure term within the field of Information Systems.(Endnote #1) This section provides a background of PKM with respect to the fields of *Organizational Learning (OL)* and its technology-based descendant, *Knowledge Management (KM)*. OL and KM broadly defined fields encompassing a number of interpretations. PKM is similarly ambiguous. Many of the terms and concepts from OL, KM and PKM

are similar, so an overview of each may be useful to the reader.

Much of the work examining the role of knowledge and learning within the workplace is rooted in the field of Organizational Learning, defined simply as how organizations learn within their environment. Huber (1991) lists the four constructs of organizational learning as knowledge acquisition, information distribution, information interpretation and organizational memory. Along this vein OL can be divided into two views: the *behavioral* view where learning is the change in the range of potential behaviors, and the *cognitive* view, where learning is the acquisition of knowledge. For this paper, the cognitive view of learning as knowledge acquisition is taken since a view of knowledge as an object is more concrete and therefore more easily understood by IS educators. (EndNote #2)

The term *Knowledge Management (KM)* is similarly ill-defined encompassing a variety of interpretations. KM has been used to describe technologies ranging from content management to groupware to knowledge-based systems in artificial intelligence. Alavi and Leidner (2001) provide a comprehensive review of the many perspectives for Knowledge Management at the organizational level. The view of KM as a formal process of managing intellectual assets is taken here. KM refers to processes of generating, capturing, organizing, storing, disseminating and using a company's knowledge (Casanota, 2004).

Personal Knowledge Management (PKM) is a fairly new term, most likely formed as an extension of KM to the individual. Multiple definitions exist but they are semantically similar. Frand & Dixon (1999) define PKM as:

"A conceptual framework to organize and integrate information that we, as individuals, feel is important so that it becomes part of our personal knowledge base. It provides a strategy for transforming what might be random pieces of information into something that can be systematically applied and that expands our personal knowledge."

Dorsey (2000) defines PKM as:

"A set of skills and practices that allows an individual to effectively and efficiently process data, information and knowledge that have come into his/her possession. In theory, these skills will allow one to be able to make better-informed decisions and more rapidly solve problems"

PKM should not be confused with *Personal Information Management (PIM)*, which refers to a set of software tools for managing email, address books, meetings, etc. Nor should PKM be confused with *Personal Knowledge Networks (PKN)*. PKNs are "virtual networks centered on individual knowledge workers that provide connectivity and information according to his or her role, location and device in use (Casanota, 2004). PKN refers to accessing the *location* of knowledge bases, whereas PKM refers primarily to evaluating, organizing and analyzing information.

Barth (2003) reports on PKM tools that can automate, accelerate or augment human processes of individual knowledge work without being dependent on the technical or financial resources of a corporate IT department. He adapted a framework for PKM under development by Paul Dorsey at Millikin University for classifying PKM tools. The Dorsey framework has seven processes that can be performed on information and ideas: accessing, evaluating, organizing, analyzing, conveying, collaborating and securing.

PKM tools have begun to emerge in the IT and e-learning marketplace (Barth, 2004). The list is extensive, including web logs (blogs), wikis, bookmark managers, online aggregators, instant messaging, RSS feed managers and concept mappers. The next section discusses personal experiences with some of these tools in the classroom.

3. PKM IN THE CLASSROOM

During the past 3 years, one author of this paper has been teaching and refining a graduate elective in Knowledge Management Systems. Recent semesters have included the use of PKM tools to help students manage the way they integrate new information into their existing knowledge structures. "Lessons learned" for four of these tools are now briefly discussed.

Mindmapping.

A mind map is defined by the encyclopedia Wikipedia (http://wikipedia.org) as "a multicoloured and image centered radial diagram that represents semantic or other connections between portions of learned material. Budd (2004) describes a mind map as "an outline in which major categories radiate from a central image and lesser categories are portrayed as branches of larger branches". He discusses the development of classroom exercises for mindmapping as an effective way for students to collaboratively investigate topics in economics courses.

Building on this idea, mindmapping was introduced into the course as a PKM technique but with a few modifications. Typically, mindmapping as an exercise is done on paper during one lecture or presentation. For this graduate course students are trained early in the semester on how to create mindmaps with a software tool called Mindmapper ™. Students are asked to create a mindmap based on knowledge they acquire during the semester for topics (central nodes) such as Enterprise Information or Knowledge Management.

Many of the mindmapping tools are similar in functionality. Mindmapper is fairly comparable and has some interesting features for PKM. (Appendix A shows a sample mindmap created by the tool.) One benefit is that students can easily drag-and-drop entire concept nodes as their knowledge structures are reshaped based on new information. Another benefit is the user can embed notes, URLs or internal hyperlinks to local files within a node which allows them to organize supplemental information about the concept. The tool allows searching through maps and can export maps to a variety of formats.

Student feedback suggests this is an effective technique for "seeing the big picture". It also discourages memorization of trivial facts—students no longer need to memorize what the facts are, they need only remember where they lie within the map (which can also easily be found by searching). Whether mindmapping increases understanding or retention over

time is a subject for future testing, but the experiences described here suggest significant promise.

Some lessons have been learned that may be of interest to other IS educators. First, the choice of labels for 2nd-level nodes is important. Students benefit by a review distinguishing common terms such as theory, model, framework, perspective and so on. Without such review, the students are prone to information overload when exposed to a large number of readings on the topic. Also, students who exhibit patience and a higher tolerance for ambiguity seem to be more successful at mapping.

Wiki

A wiki is a web application that enables documents to be written collectively in a simple markup language using a web browser. A wiki site generally contains many highly interconnected pages, made possible by several local hyperlinks embedded within each page. Appendix B shows a sample wiki page. The name "wiki" is based on the Hawaiian term wiki wiki, meaning "quick" or "informal" (Fichter, 2005).

Wikis are about 10 years old, but only recently have been catching on as corporations are recognizing their immediate value (Udell, 2005). Certain features of a wiki make it an excellent choice for the classroom. First, wiki pages evolve based on collaboration from many users' perspective. Wiki etiquette (see http://en.wikipedia.org/wiki/Wikipedia:Wikiq uette for an example) suggests many useful guidelines for educators:

- Keep wiki pages conversational in tone and written from a neutral point of view.
- Be polite. Expect your pages to be modified and be respectful of others' opinions. Work toward agreement.
- Don't delete other people's contributions (unless you know what you are doing).
- Break down complex topics into multiple pages where possible. This encourages reusability at the page level.
- Provide a context for your pages and hyperlinks. Instead of "More info about etiquette can be found here", use "More

info about etiquette can be found at WikiEtiquette".
- Do not copy and paste from sources. Cite references wherever possible. Provide links to supplemental information if you know them.

Wikis have other features which make them very attractive for education. Many wiki applications are free from the open source software market and have substantial functionality for administration. For example, Mediawiki, the software that powers wikipedia.org, has been around for some time, can be downloaded for free and is easily installed. The learning curve for formatting pages is very small since the functionality is intentionally limited. Most wikis include the basics from HTML, such as tables, hyperlinks, lists, headings and text formatting.

The course assignments with wikis have grown over the past few quarters. After some experimentation, Mediawiki rose to be the best software available in terms of functionality and support. At the beginning of the class, the instructor did a quick demonstration for authoring wiki pages, then require students to create pages for 4 terms associated with KM, such as Business Intelligence, knowledge worker, intelligence, etc. Over the quarter, students are expected to create more complex pages, such as company or product analyses, and incorporate hyperlinks where possible(End Note #3) The class wiki will quickly grow and can evolve from quarter to quarter.

The result is a very positive experience in PKM. Students reported that creating wiki pages is difficult at first, but they can become proficient within a short time. The wikipedia.org pages are excellent templates in this regard.

News Aggregators/RSS Readers.

A news aggregator is a software package that allows the user to scan large amounts of condensed news in a short period of time through a single, consolidated view (Stepno, 2004). Examples of news aggregators are Pluck, Bottomfeeder and Newsgator. The software can sometimes be installed as either a browser plug in or a standalone client application.

News aggregators take advantage of the fact that many web sites now publish their content in RSS, which refers to a family of XML file formats for web syndication used by news websites and weblogs. (The interpretation of RSS varies, the term can stand for Rich Site Summary or Really Simple Syndication, e.g.).

There are many packages available, but most have similar functionality, such as the ability to manage feeds, create bookmarks, etc. Pluck, for example, is a free newsreader (without banner ads or spyware) that integrates with Internet Explorer to enable the user to read newsfeeds inside their default browser. Pluck allows users to create perches (persistent searches), manage Web bookmarks across multiple computers, share Web pages and notes with friends and sort and filter Amazon, eBay, and Google queries (Rupley, 2005). Appendix C shows a screen shot of the Pluck interface.

Personal experience in the classroom with Pluck has been limited to special projects assigned to interested students. Programs such as Pluck can be difficult to remove and should be installed with caution. Students who have used it, however, state that they see its advantages immediately. One recommendation is to instruct students to begin with a topic very familiar to them, such as a personal hobby. Creating perches in a domain they know well seems to help them appreciate the information stream management problem and to understand the applicability of the software.

Blogs.

Weblogs (blogs) are online personal journals in which individuals share their own viewpoints and personal agendas. Blogging has become popular in the political and corporate arenas. Blogs are usually authored by one individual, but recent advances are enabling collaboration through the use of public comments.
Personal classroom experiences with blogs in the course have been more negative than positive, but the usage has been limited. The major student complaints include a) they do not understand what they should be writing in their blog, b) the blogs are impractical to access when ideas surface, and c) they do not recognize benefits of blogging with respect to learning. Instructors wishing to pursue this topic may be interested in Flatley (2005), who discusses the use of blogs in business courses.

4. SUMMARY AND RECOMMENDATION OF PKM IN THE MS IS 2006 CURRICULUM MODEL

Several options exist for incorporating PKM concepts into the MSIS 2006 curriculum. While an instructor can incorporate the techniques and technologies described here into most any course, the more likely option would be to create a separate course for KM and PKM. The latter would probably be impractical for many programs, since the curriculum model increases the number of courses from ten to twelve.

Another option would be to build the material into the Fundamentals of IS prerequisite course. The primary advantage of this approach is the PKM material will be covered early on, so students can utilize the strategies they learn throughout their program. This advantage is based on assumptions that PKM will improve understanding and retention which seem plausible. PKM material works particularly well when coupled with a visit by the librarian who discusses the variety of databases and resources available to students, such as ABI/Informs, Gartner, Hoovers, etc. The disadvantage of this approach is that prereqs are usually optional, so students not taking the course may be at a disadvantage.

Perhaps the best option is to incorporate PKM within the Emerging Technologies and Issues course. The MSIS 2006 curriculum currently has KM as a topic in this course, so moving it earlier in the program and reorganizing its content to emphasize PKM as well as KM may accomplish the goals set forth here. This option would require the smallest modification to the curriculum model as it is presently conceived.

5. FUTURE DIRECTIONS

This paper has provided some background information on new technologies within the field of Personal Knowledge Management.

While untested, the field holds promise for alleviating some of the problems associated with transition to the new curriculum model, MSIS 2006. Initial observations from adoption of the tools and techniques were discussed.

Each of the technologies must be tested to determine their contribution toward learning. Longitudinal studies of cohorts of students across multiple semesters are needed to determine the effects of PKM on retention. Other PKM techniques not discussed here such as blogs should be investigated as well. It would also be helpful to IS educators to learn the best practices for adopting these technologies.
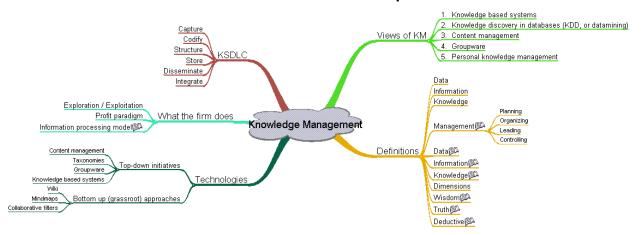
6. ENDNOTES

1. A search of the ABI/Informs database for the phrase "personal knowledge management" produced a total of 3 results, with the oldest published in 2003.

2. The debate on the difference between information and knowledge is well known but beyond the scope of this paper. Knowledge is assumed to be the stock of what one knows, or the understanding of relationships between concepts stored inside a human's head. Information is the articulation of this knowledge onto some form of medium.

3. As an example, the instructor freely show students "the solution", i.e. the instructor points them to wikipedia.org which possesses some very detailed pages about these topics. While students could easily copy-paste their assignments, the experience is they resist the temptation. The usual problems of potential cheating in a collaborative environment remain here.
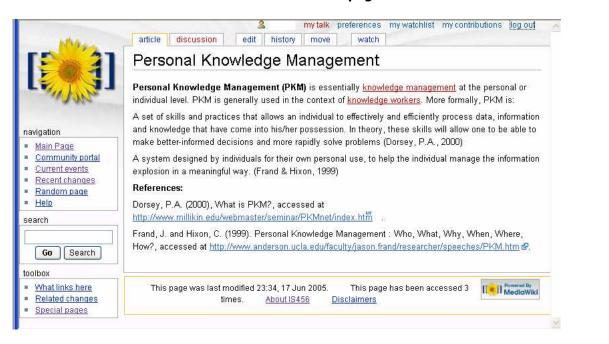
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APPENDIX A.

Screen shot of a Mindmap.

APPENDIX B.

Screen shot of a Wiki page.

APPENDIX C.

Screen shot of a Pluck page.