The Relationship Between Research and Practice: What Are We Learning About Teaching Personal Information Management?

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ABSTRACT

Research should inform practice as well as guide developers in designing better tools. Much of the emphasis on Personal Information Management (PIM) research has been developing better tools for finding information among expanding work spaces. This research attempts to look at PIM from a pedagogical perspective – what we have learned that may inform our teaching. Web sites were examined and scholars were surveyed. Our findings suggest that PIM is not yet achieving significant attention in the information and library science (ILS) curriculum.

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Personal information management; User education.

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INTRODUCTION
Research into the PIM behaviors of individuals in various contexts can be traced from the early 1980's (Cole, 1982; Lansdale, 1983; Malone, 1983). Much of the research has been conducted and used by software developers and computer scientists to design and implement useful tools for personal computers (Dumais et al., 2003; Bellotti et al., 2004). A search of the ACM Digital Library using the keywords "personal information management" returns more than 500 papers and some 100 authors who have explored aspects of PIM. A search of the information and library science literature results in more than 100 papers, many overlapping with the ACM study, but many from different sources as well. The information and library science field has a stake in this research, but with different questions and different concerns. Information professionals, including archivists, information architects, and librarians are concerned with human information behavior. Helping individuals to manage, process, use, and preserve their information for the various contexts in which they work is at the heart of PIM from the ILS perspective.

The purpose of this study is to examine the status of PIM in information and library science programs. PIM is still an emerging area of inquiry, but it is mature enough after more than twenty-five years to have some influence on the ILS curriculum. If we define PIM broadly, as Jones (2007) does, emphasizing "the organization and maintenance of personal information collections in which information items, such as paper documents, electronic documents, email messages, web references, handwritten notes, etc., are stored for later use and repeated re-use," then its connection to the information and library science field is clear.

BACKGROUND

PIM researchers have studied behaviors in a variety of settings, yet we have little to recommend in terms of formula or procedures that will ensure more effective PIM. One explanation for this lack of convention is simply that we are so diverse, our needs so varied, and our situations and styles so unique that one solution simply cannot fit all. We are left with information about PIM behavior that is of sociological and psychological value, but offers little to inform future information architects, analysts, archivists, and librarians.

A second reason for our lack of progress in defining and prescribing successful PIM practice is the emphasis on finding. Research has shown that people are reluctant to develop and maintain formal organization system for their personal information. Consequently, data stored in our personal workspace is growing exponentially and without good search tools, much of this data may become quickly inaccessible. However, finding is not the only function related to PIM – we interact with information in a variety of ways, including being reminded of things that we need to do, encountering things that we have forgotten, rereading or reviewing past work, converting and transferring data to new hardware or software environments, and even organizing and purging directories of unwanted files. When people are interviewed about their behaviors, they often ask about how they might work more effectively.

The only study of PIM in the university curriculum that we could locate was undertaken and reported in 1985. At that time five library and information science schools offered PIM courses to undergraduate students, and four schools incorporated aspects of PIM in other classes. Goals for those courses included "the role information plays in society, how to identify information resources within and outside the library, and the use of the personal computer as an information resource both for their college studies as well as for life-long learning" (Jahoda & Brockmeier, 1985). The questionnaire in that study was sent to the deans of library schools. While many recognized the value of such classes both for the students and for potential recruitment of those students to graduate programs, the researchers found there was little demand for such a course and some schools, which previously had offered the course, dropped it due to low enrollment.

In 1985, computers were becoming more accessible to individuals, particularly in university libraries and computer labs, but in the home as well. Research into personal information management behaviors, including studies of human-computer interaction, emerged at this time. Twenty years later, technology has advanced to the point that our cell phones have more memory and processing capability than the personal computers of 1985, and we have the ability to make use of a variety of devices for storing and using information from wherever we are. As technology advanced, needs to improve the usability of these devices and to understand their benefits and consequences for our personal and collective behaviors have stimulated research. An international research community has emerged, led by William Jones, holding workshops approximately every 18 months since 2005 to share ideas and raise questions. One goal of *this* study is to assess the impact of this research community on professional education.

METHODS

The purpose of this study is to examine the state of PIM in the curriculum. To achieve our purpose, we decided to look at what is being taught related to PIM and to touch base with researchers to assess their feedback on pedagogical issues. This research involved the following steps:

(1) Examine the Web sites of the information and library science schools, and the schools of PIM researchers in other fields, to identify courses devoted to PIM or that cover PIM issues.
(2) Gather related syllabi and analyze them for target audience, topical content, and skill set.
(3) Identify PIM researchers from colleges and universities who also have teaching responsibilities and survey them concerning how they address PIM in their teaching.

There is some precedence for these methods. Various aspects of the ILS curriculum have been studied in the past including such areas as cataloging, digital libraries, knowledge management, and digital preservation (Turvey & Letarte, 2002; Hsieh-Yee, 2004; Gracy & Croft, 2006). The purpose of these studies included assessing trends and objectives, and in some cases, making practical recommendations. Our study utilizes similar data collection strategies to assess how PIM research is informing ILS teaching and practice.

Although we focus primarily on schools of information and library science, we cast our net a bit wider, looking at schools where PIM researchers were found (some in computer science departments, for example) as well. We could not approach these departments systematically because we did not have a comprehensive list of those programs as we did for the information schools, but we have included analysis of courses in those departments when we found them.

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- Is there evidence that the LIS curriculum has been informed by PIM research?
- What is being taught currently with respect to PIM?
- Can we identify PIM-related concepts, topics, and findings that should be included in professional education?

RESULTS

Examination of the School Web Sites, Catalogues, and Course Syllabi

Examination of the information and library science school Web sites (and the Web sites of the researchers identified in our sample described below) resulted in the identification of six programs with a PIM course, and nine programs offering some aspect of PIM within the broader context of other courses. The PIM courses appear to be special topics courses that are not part of the regular curriculum. Two of the courses conform to the 1985 focus for PIM, a class designed to help undergraduates acquire, organize, and present information. Four of the classes take a broad approach, providing opportunities for students to explore and conduct their own research or develop PIM tools. The latter courses are designed for advanced (mostly graduate) students.

The three institutions offering research-oriented courses in PIM are, not surprisingly, institutions where there are five or more scholars conducting PIM research. The institutions include Virginia Tech, the University of Washington, and the University of North Carolina at Chapel Hill. Of the nine institutions where PIM was clearly identified as a sub-topic within a broader course, only two (Rutgers and the University of Hawaii) have faculty engaged in PIM research. Courses that cover some aspect of PIM include information retrieval, collection development and management, knowledge management, basic computer skills, information organization, and computer-mediated communication. Relying upon the Web for this analysis is problematic, for reasons that will be discussed later.

Identification and Survey of Researchers

A search of the PIM literature in Library and Information Science Abstracts, the ACM Portal, the ISI Web of Science, and prior PIM Workshops identified 237 researchers (authors and co-authors) who have published

papers related to personal information management, and 140 of these are teaching faculty.[1] Researchers represent 15 countries and 54 academic communities, and cover such disciplines as information and library science, computer science, psychology, education, management, and engineering. We verified institutional affiliations and electronic mail addresses, prepared a survey, obtained approval from our Institutional Review Board for Human Subjects Research, and conducted the survey in early March 2009. Responses identified courses that our Web analysis missed and provided additional information on topics covered, resources used, and insight into why PIM may not have been offered. We received 48 responses (34.3%) of the 140 surveyed.

Results confirm the findings from the Web analysis and identified additional courses that address PIM in some manner. Table 1 illustrates responses to questions about course offerings. The PIM courses are not required – all are special topics or seminars that are offered irregularly. However, 6 of the courses that include aspects of PIM are required by their respective departments.

	Yes	No	Total Responses	No response
Teach a course on PIM	6	42	48	0
Include PIM in a course	16	25	41	7
Plan to offer a course on PIM	3	13	16	32

Table 1. Respondents who address PIM in some way.

Respondents were asked why they thought PIM courses were not offered at their respective institutions. Three

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[1] Many PIM researchers can be found in the research and development institutes of major corporations, including Microsoft Research, Xerox Parc, IBM Watson Labs, and Google. These researchers were not included in our study.

indicated that there is not enough interest in the subject, 7 responded that PIM is not perceived as important enough to be the focus of a course, 2 indicated that there were not enough resources to offer the class, 7 responded that there are not enough faculty to cover PIM as an area of study, and 7 indicated other reasons. Responses that fell into the "other" category were varied. In fact, two persons indicated that their programs have a PIM class, but they do not teach it. Another participant said, "I think it's spread out over various classes. Also, the main principles are taught but are not called PIM (for example building a database for a personal collection, indexing a personal collection, etc.).

Among the courses that participants identified as covering some aspect of PIM are:

- Advanced Seminar in Interactive Information Retrieval,
- Artificial Intelligence II,
- Computer Privacy and Security,
- Datamining in Education,
- Digital Libraries,
- Human-Computer Interaction, Design, People and Security,
- Human Information Behavior,
- Information Retrieval,
- Internet in Higher Education,
- Introduction to Human-Computer Interaction,
- MSC HCI (use for research/design projects),
- Multimedia Content Production,
- Organization of Information,
- Personalized Information Delivery: Information Filtering,
- Public Libraries,
- Retrieving and Evaluating Electronic Information,
- Software Engineering: Advanced Topics in Software Systems, and
- Survey of Human-Computer Interaction Research.

We asked instructors to identify the important readings assigned in their PIM courses. Although most were aware of PIM-related texts, including *Personal Information Management*, and *Keeping Found Things Found*, instructors typically assigned a variety of articles, and two of the instructors shared their entire reading list.

Finally, we asked participants what they thought students should know about PIM. This question is central to understanding the relationship between research and practice. We have grouped responses into three broad categories: (1) structure and use of information, (2) social and psychological framework for PIM study, and (3) information technology. These are discussed below.

Structure and Use of Information

Information structure and use is largely the concern of the information and library science field. These answers are characterized by a concern for differentiating between Information Management broadly, and Personal Information Management specifically, and for understanding the relationship between them. Responses included the following:

- "Understand what is meant by personal information, and how PIM differs from traditional IR/management/learning techniques by taking into account the particular relation of users and their information, that has special meaning to them. They should also be aware of the issues regarding the design of PIM applications, and the challenges this poses regarding indexing and access to the data, browsing, searching and visualizing personal information."

- "Understand information and the various ways in which it is used. Understand various approaches and strategies in PIM and support for them (e.g. piling, filing, searching, organizing, etc.)"

- "Finding, re-finding, weeding/pruning, tagging and other socially derived naming and categorizing (PIM in community)"

- "List the types of information that must be organized and managed, the sources of overload, and our own information management challenges."

- "In teaching public libraries, the goal of introducing PIM is to encourage students to think about ways in which libraries can connect with individuals in their personal information space in order to support information literacy education in the area of PIM and to create connections between personal information and community creation. Explain 'insider' comments. Ensure that your whole audience understands any reference whose meaning you do not describe (e.g., do not assume that everyone has used a Macintosh or a particular application)."

- "PIM as part of user modeling; implications for the design of information filtering systems, recommender systems; design of personal digital libraries and personal websites."

- "Identify the characteristics of personal collections that complicate PIM (distributed collections, collections fragmented by form, size, etc.) and the implications for both current refinding and long-term keeping. Draw connections between their professional interests and PIM (for example, interface design and opportunities for building better PIM tools; digital archives and issues of personal digital collections; librarian (various flavors) and possible bibliographic instruction, service, and resource design issues to help people assess/do PIM). Think critically about PIM systems – their own and those of others. What works? What doesn't? What is good enough? What works now, but might be problematic in the future? What, given the realities of work and life, could be improved?"

Social and Psychological Framework for PIM Study

Those who identified social and psychological frameworks for study emphasize the importance of research and indicate such perspectives as "serious leisure" and "everyday life information seeking" as possible frameworks for PIM analysis. The connection between PIM and other disciplines, including computer science, psychology, education, information and library science, sociology, and business was offered as a possible framework for PIM study. Some respondents were interested in exploring the history of PIM as a matter of popular and public interest to get a better understanding of its utility as an area of inquiry. Others suggested that a communications approach is useful to understand how people share information, or a consumer approach to understand how people identify and use information.

Most of these responses focus on the importance of communication and information sharing as being the critical concern for why PIM matters. Information is shared in the workplace, in social networks, or in our close, personal relationships, and these contexts may offer their own frameworks for addressing issues of portability, security, and rights management.

Information Technology

Many of the responses focused on the importance of designing, selecting, configuring, evaluating PIM tools. One respondent indicated that it is important to "design and develop a prototype to solve a specific problem in PIM."

DISCUSSION

There are always limitations to studies such as this one. Analyzing Web sites will fail to identify information that is not reported or will misidentify information that is out of date. Additionally, course descriptions are often incomplete, course syllabi are not always available, international sites may not be translated to English, and schedules often fail to list the frequency with which a course is offered. Similarly, surveys restrict options so that respondents are forced to select an answer that may not precisely reflect their situations. Any discussion or analysis of the above results must consider these limitations.

Our study posed three questions. The first was whether information and library science education has been informed by PIM research. While PIM-related issues are clearly recognized and discussed within a variety of classes, the idea of PIM as a significant area of inquiry has not been widely embraced. This is not to suggest that it should – only that we as researchers should be asking, and perhaps promoting, lessons learned that may benefit others if incorporated in our curricula. Early on, the focus of PIM was the design of better tools. The tools have improved, but our practices have not. In fact, better tools may have contributed to poor practice by making it easier to find things no matter how badly one has organized them and by providing the illusion that backing up one's files is somehow preserving them. We will continue to build better tools, but these results suggest that we also need to focus on the management of personal information as well.

The second question addressed what we are currently teaching. The information and library science curriculum has not addressed PIM systematically. Courses are offered in programs where researchers are concentrated, but PIM-related readings, PIM-focused projects, and topical lectures are included in a variety of programs and courses.

The third question concerned the concepts, topics, and findings that should be included in the curriculum. Three perspectives were identified as key PIM-related approaches: the structure and use of personal information, social and psychological perspectives of PIM, and information technology to support PIM. Although there is no consensus from our participants concerning what specifically should be addressed, there is considerable overlap among assigned readings, suggesting some commonality in what is studied. Researchers working in

fields as diverse as digital preservation and collaborative information retrieval have begun to relate the PIM literature to their course content. Examining the assigned readings in the context of the course objectives and syllabi may provide a better indicator of the specific, valued concepts and relationships.

SUMMARY

Our assessment of PIM in the curriculum raises questions about the relationship between research and teaching. It has always been true that programs vary in part on the basis of strengths and interests of faculty. Those of us with the responsibility for training information professionals have a broader concern, specifically what we are learning from our research that can and should inform our students. After more than 25 years of inquiry, it is time that we articulate the message, if there is one, about how PIM should be addressed in the curriculum.

Future work will include a follow-up conversation with teaching faculty to assess specifically how PIM fits in the broader curriculum, and a study to assess whether there is a relationship between PIM behaviors of students and academic performance. It would be helpful to expand this work to other fields as well. In the information and library science field, we have seen movement from mediated information seeking toward self-serve applications. It may be even more important than ever to understand what people are doing with information, and how they are doing it, to design more effective information products and services.

REFERENCES

Bellotti, V., Dalal, B., Good, N. , Flynn, P., Bobrow, D.G. & Ducheneaut, N. (2004). "What a to-do": Studies of task management towards the design of a personal task list manager. *Proceedings of CHI 2004*, 735-742.

Cole, I. (1982). Human aspects of office filing: Implications for the electronic office. *Proceedings of the Human Factors Society*.

Gracy, K.F.and Croft, J.A. (2006). Quo vadis, preservation education? A study of current trends and future needs in graduate programs. *Library Resources & Technical Services, 50 (4)*:274-288.

Hsieh-Yee, I. (2004). Cataloging and metadata education in North American LIS programs. *Library Resources & Technical Services, 48(1):*59-68.

Jahoda, G. and Brockmeier, K.C. (1985). Personal information management courses offered by library schools. *ASIS Proceedings 1985*, 217-18.

Jones, W. (2007). *Keeping Found Things Found: The Study and Practice of Personal Information Management*. Morgan Kaufmann.

Lansdale, M. (1983). The psychology of personal information management. *Applied Ergonomics, 19:*55-66.

Malone, T.W. (1983). How do people organize their desks? Implications for the design of office information systems. *ACM Transactions on Office Information Systems, 10:*99-112.

Turvey, M.R. and Letarte, K.M. (2002). Cataloging or knowledge management: Perspectives of library educators on cataloging education for entry-level academic librarians. *Cataloging and Classification Quarterly, 34 (1/2):*163-185.

Appendix. Survey Questions

1. Do you teach a course on Personal Information Management (PIM)?
   ___Yes
   ___No (skips to question 5)

2. At what level is this course taught?
   ___Undergraduates only
   ___Advanced undergraduates and graduates
   ___Graduates only
   ___Continuing education
   ___Other (Please indicate: _____)

3. Is this required coursework or an elective?
   ___Required
   ___Elective

4. When you cover PIM in your teaching, what readings do you assign? Please list the textbook and/or the most important assigned readings. (Open-ended response, text box provided)

5. Do you incorporate PIM into any courses that you teach?
   ___Yes
   ___No (skip to question 7)

6. Into what other courses do you incorporate PIM? Please list courses.

7. Do you teach full-time or part-time?
   ___Full-time
   ___Part-time

8. If your institution does not offer courses in PIM, what are the likely reasons? (check all that apply)
   ___Not enough student interest
   ___There is not enough content to warrant a separate course on PIM
   ___Lack of resources (teaching, classroom space, or funding)
   ___Not relevant to the school's degree programs
   ___Other (specify)

9. Does your institution plan to introduce PIM coursework in the near future (1-3 years)?
   ___Yes
   ___No

10. Please indicate in the space below what students should learn, or should be able to do, as result of taking a course on Personal Information Management. (Open-ended response, text box provided)

11. May the investigators of this study contact you or a representative of your institution again if there are any follow-up questions?
   ___No, I would prefer not to be contacted again.
   ___Yes, I (or a representative of my institution) may be contacted if there are follow-up questions. Please contact _____ at the following address, phone number, and/or e-mail:_____ _____