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Personal Knowledge Management: A Study of Knowledge Behaviour of Academicians

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Abstract. Current theories of knowledge management postulate a cycle of knowledge creation, refinement and implementation that hinges on the transformation of tacit, or practical, into explicit, or discursive, knowledge. The modern organisation, because it is characterised by diverse local practices, and by the increasing salience of professional work, is thus a complex mosaic of situated knowledge, grounded in process. Enabling organisations to capture, share and apply the situated knowledge grounded in the process is seen as fundamental to competing in the knowledge economy. The study is focussed on the various knowledge activities of faculty members to understand the extent of impact of information systems on those activities and how those activities contribute to value creation and knowledge management. The results of this study suggest the presence of certain type of knowledge behaviours which facilitate knowledge management.

Keywords: Personal knowledge management; PKM; knowledge management; information systems for knowledge management.

1. Introduction and Purpose of the Study

In recent education and training policy and research there has been growing emphasis on "capacity-building", an orientation to educational organisation which acknowledges, orchestrates and applies learning as a means to both organisational change and enhanced educational outcomes. Teachers become "learning professionals", no longer simply responsible for structuring others' learning but also for ensuring their own ongoing learning and its applications in local work contexts. This emphasis on capacity-building to create and sustain lifelong learning has stimulated considerable interest in teachers' working knowledge and the conditions that support the formation of capacity-building organisations in education.

Management education institutions are recognised to be in the knowledge business, and are exposed to marketplace pressures in a similar way to other businesses. They are information processing systems that continuously deal with and disseminate interpretation and learning derived from an uncertain and fast changing business environment. The institute's interaction with its environment, together with the means with which it creates and distributes information and knowledge, is central to building an active and dynamic knowledge environment. Educational institutions do have a significant level of knowledge management activities, and it is important to recognise these, and use them as foundations for further development of the educational processes. Management institutions as well as the faculty must recognise and respond to their changing roles in a knowledge-based society by consciously and explicitly managing the processes associated with the creation of knowledge assets. The primary mission of educational institutions is the creation, preservation, integration, transmission and application of knowledge, and it changes dramatically with the advent of information technology. Dretske (1981) comments that the way one interprets, conceptualises and internalises information creates knowledge. Any knowledge management strategy designed to improve performance of an educational institution must address three components: (1) the work processes or activities that create and leverage knowledge; (2) a technology infrastructure to support knowledge capture, transfer and use; (3) behavioural norms and practices that are essential to effective knowledge use (Bhatt, 2001; Zack, 1998).

The knowledge-based view of the organisation views the organisation as a knowledge creating entity, and argues that knowledge and the capability to create and utilise knowledge are the most important sources of the organisation's sustainable competitive advantage (Prahlad and Hamel, 1990). Organisation culture, i.e., the values, beliefs and work systems, is believed to be the most significant input to encourage or impede learning and create knowledge, and in the process enhance the decision-making capabilities of the organisation. Therefore, the organisation culture should provide support

and incentives as well as encourage the knowledge-related activities by creating environments for knowledge exchange and accessibility. An organisation culture that fosters a knowledge environment will henceforth be called "knowledge culture" in this study. The knowledge culture characterises the ability to use prior knowledge to recognise the value of new information, assimilate it and apply it to create new knowledge and capabilities (Alavi *et al.*, 2005). A culture that is positively oriented towards knowledge is one where learning on and off the job is highly valued, and where hierarchy takes a back seat to experience, expertise and rapid knowledge is captured, legitimised and distributed throughout an organisation. Cultures that explicitly favour knowledge sharing and knowledge acquisition will create a context for interaction that is favourable to leveraging knowledge and hence build a knowledge culture. A knowledge-centered culture is embodied in the institutional characteristics which encourage and facilitate the creation and dissemination of knowledge.

Creating a knowledge culture is not only of information architecture and structure, but also of the situation where the user develops the information need, analyses the information and gives it an interpretation. When knowledge is viewed as a product of social interaction and interpretation, instead of as an object (e.g., a database, report, e-mail, document), then culture becomes even more central for understanding how to leverage knowledge because it creates the context for interaction in which knowledge is created and used (a database takes the form of a knowledge repository; a report takes the form of an interpretation and understanding; a document which can be retrieved at a later date takes the form of memory for understanding and action at a later date). Technology comprises a crucial element of the structural dimension needed to mobilise social capital for the creation of a knowledge culture. Through the linkage of information and communication systems in an organisation, previously fragmented flows of information and knowledge can be integrated (Teece, 1998). The Information environment, which is a collection of technology, people and organisational arrangements, has the unique features for facilitating a knowledge culture.

2. Literature Review

In a world of rapid and continuing change, it is imperative that organisations maximise their return on all assets. One of the least-exploited assets is the knowledge that resides within the individuals and groups of the organisation. Davenport's (1998) four types of knowledge management objectives are: the creation and maintenance of knowledge repositories; improving knowledge access; enhancing knowledge environment; and valuing knowledge.

Traditionally, knowledge is stored in the minds of experts in the form of tacit knowledge and in the form of reports, presentations, videos and documents in the form of explicit knowledge. Personal knowledge is difficult to store in the form of documents and reports and is difficult to retrieve and access if it exists as tacit knowledge in the minds of experts. One important prerequisite to knowledge management is to make knowledge and expertise of an individual explicit, so as to integrate learning into the organisation's knowledge base. Knowledge management characterises the ability to use prior knowledge to recognise the value of new information, assimilate it and apply it to create new knowledge and capabilities (Alavi *et al.*, 2005). Information may be analysed to create new knowledge, thus adding value to information so that it is able to produce action. According to Oluic-Vukovic (2001), technologies are useful at this stage because they can facilitate the creation of new knowledge through the synthesis of data and information captured from diverse sources but they are silent about which type of information technology tools has more impact on the creation/conversion of knowledge.

Ortrun (2005) proposed a "soft methodology" model in knowledge management that addresses the problem of accessing and managing one particular type of knowledge: personal (implicit/tacit) knowledge. The capability of an individual to utilise knowledge by codification and representation is an important step in building a PKM (Prahlad and Hamel, 1990). The explicit representation of an interpretation schema is what we call a context. A context can be extracted in different ways through interpretation. Information, once it is processed in the minds of the individuals, becomes knowledge, and when this knowledge is codified and represented it can be shared and distributed. Knowledge which is represented well is understood and communicated better. Knowledge has to be structured and codified to be stored and made available to all.

For knowledge to be utilised, it has to be accessible to the people. Once knowledge has been stored and internalised, the organisation's knowledge needs to be accessible to persons who need it, e.g., via its availability in document-ware, through verbal communication within a human network, through databases, etc., Employees have to know what knowledge exists within the organisation and which of their own experiences should be made accessible to others so as to assist them. Discovery involves locating internal knowledge within the organisation. This process addresses the oft-quoted

phrase, "if only we knew what we know". Large, non-hierarchical or geographically dispersed organisations find this knowledge-gathering process especially helpful as one part of the organisation may not be aware of the knowledge existing in its other parts.

What is new is that networks of individuals are created, within but also outside the firms, and even through the frontiers of the firms. These networks may form communities, like communities of practice (Lesser and Storck, 2001). They simply make up pools of inventors that coordinate to exchange their specialised bundles of knowledge. One of the main characteristics of a knowledge management is an increase in the collective fund of information, through content and information aggregators, which results in the collective growth of knowledge, in turn translating into societal progress, and into greater individual and community knowledge acquisition. The determinant of success in getting people to submit their most valuable personal knowledge to a repository is the existence of a "personal knowledge management" (PKM) in an organisation (King, 2006).

Knowledge sharing involves the transfer of knowledge from one (or more) person to another one (or more). Not only should organisations ensure that all knowledge should be documented, but they should also be ready to implement different methods for sharing different types of knowledge to facilitate the sharing of employee knowledge throughout the organisation. Tacit knowledge is shared through communities of practice by making people working together or interacting in the workplace share their experiences. Explicit knowledge is shared through expert systems and by mapping experts and their knowledge resources (Snowden, 1998). Knowledge is dynamic — it goes through human brains for knowing, invention, propagation, fusion, generalisation and problem-solving. Research articles are the major medium that carries knowledge between researchers and practitioners (Zhuge, 2006). Great importance is laid in the flow of knowledge, i.e., knowledge sharing to the development of knowledge. Knowledge sharing is perceived, for example, by the World Bank as critical for economic development and as an important next step going beyond the dissemination of information (MacMorrow, 2001).

The power of knowledge to beget knowledge, also enhanced through the growth of information on global networks (accessed by learners), leads to the exploitation within the community of users of knowledge that might otherwise remain unexploited (e.g., talents or previous knowledge that are incomplete). The more information and knowledge are available through global networks, the more varied are the paths and opportunities for knowledge creation. With mobile technologies and the Internet, not only is the collective amount of accessible information and knowledge growing, but so is its diversity. The potential for cross-cultural knowledge exchange, knowledge transfer and cross-fertilisation of ideas is greatly improved through global networks and wider access. Diversity relates not only to the types of knowledge, but also to the shape in which knowledge is "encoded", or the shape in which it is accessible — for example, one can think of the many kinds of multimedia and interactive tools available today and in the future. This will once again increase the potential reach of knowledge. Such tools, combined with always-on access characteristic, enhance the potential utility of complementary or supporting information and knowledge.

According to Davenport and Prusak (1998), most knowledge management projects have one of three aims: (1) to make knowledge visible and show the role of knowledge in an organisation, mainly through maps, yellow pages and hypertext tools; (2) to develop a knowledge-intensive culture by encouraging and aggregating behaviours such as knowledge sharing (as opposed to hoarding) and proactively seeking and offering knowledge; (3) to build a knowledge infrastructure, in terms of a web of connections among people given space, time, tools and encouragement to interact and collaborate.

3. Research Objective

In this paper we develop a framework for understanding contribution behaviours, which we define as voluntary acts of PKM. Our focus is on why and how faculty members make contributions to the PKM system, and as a result, to the knowledge resources of an institute through information technologies. The study tries to develop a model of PKM that delineates six mediating mechanisms: (1) CONTRIBUTE; (2) DIVEST; and (3) USE (4) ASSESS (5) GET (6) LEARN. We specify the role of information technology in facilitating contributions to personal knowledge resources as well as to the knowledge resources of the world.

4. Method

The present investigation surveyed faculty members from management institutes offering Masters of Business Administration/Post Graduate Diploma in Business Administration. Items gathered information about technology use patterns, computer experience and use of technology for teaching, changes to teaching and learning, incentives and barriers, using a survey instrument. The survey was distributed using paper-based mail and e-mail. Complete data were obtained from 150 respondents, 57 of whom completed the web-based survey and 93 the paper-based version. Respondents were on an average 37.5 years

Table 1. Correlation analysis between demographic variables and the six factors.

	Regr. factor score 1 for analysis 1	Regr. factor score 2 for analysis 1	Regr. factor score 3 for analysis 1	Regr. factor score 4 for analysis 1	Regr. factor score 5 for analysis 1	Regr. factor score 6 for analysis 1
Age						
Pearson correlation	−0.014	−0.290**	−0.193	0.043	−0.167	−0.061
Sig. (2-tailed)	0.899	0.005	0.066	0.684	0.114	0.564
Educational qualifications						
Pearson correlation	−0.218*	0.156	−0.069	−0.189	−0.092	0.130
Sig. (2-tailed)	0.038	0.139	0.514	0.073	0.385	0.221
IS usage						
Pearson correlation	0.148	0.057	0.160	0.148	0.116	−0.018
Sig. (2-tailed)	0.162	0.593	0.131	0.162	0.273	0.868
Total experience						
Pearson correlation	−0.002	−0.190	0.047	0.082	−0.135	−0.098
Sig. (2-tailed)	0.985	0.071	0.659	0.437	0.203	0.355

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

old, and had an average of 12.5 years experience as faculty member. The study used a likert scale of 1–5 to elicit response.

A principal component factor analysis was conducted to classify the knowledge activities of faculty members (knowledge dissemination, sharing, creation, accessibility, repository and representation). To further understand the impact of different categories of information tools (storage, acquisition, distribution, communication, interpretation), chi-square tests were conducted. The results of the chi-square tests are shown in Table 1.

5. Results

The variance explained by the initial solution, extracted components and the rotated components is displayed in Table 2. The total variance shown in Table 2, accounted for by each of the six components explains nearly 71% of the variability in the original 26 variables. So we can reduce the original data set by using these six components (Eigen values greater than 1 as shown in Table 2) with only 29% loss of information.

Looking at Table 3, the study shows six factors (which represent the six characteristics of knowledge culture) derived from 26 variables (which represent the impact of information systems on the various academic activities). The components of each factor shown are highlighted in Table 3.

Factor 1 can be labelled as CONTRIBUTE; Factor 2 can be labelled as DIVEST; Factor 3 can be labelled as USE; Factor 4 can be labelled as ASSESS; Factor 5 can be labelled as GET; Factor 6 can be labelled as LEARN.

Table 2. Total variance explained.

Component	Initial eigen values			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	11.445	44.018	44.018	11.445	44.018	44.018	3.598	13.839	13.839
2	1.841	7.080	51.098	1.841	7.080	51.098	3.423	13.164	27.003
3	1.503	5.782	56.880	1.503	5.782	56.880	3.085	11.867	38.870
4	1.411	5.427	62.307	1.411	5.427	62.307	2.970	11.423	50.293
5	1.192	4.585	66.893	1.192	4.585	66.893	2.831	10.889	61.182
6	1.032	3.969	70.861	1.032	3.969	70.861	2.517	9.679	70.861
7	0.851	3.274	74.135						
8	0.695	2.672	76.807						
9	0.647	2.489	79.297						
10	0.603	2.320	81.616						
11	0.550	2.117	83.733						

Table 3. Rotated component matrix.

Variables	Component					
	1	2	3	4	5	6
Peer interaction	0.039	0.764	0.431	0.207	0.073	0.073
Faculty industry interaction	0.264	0.479	0.473	0.070	0.343	−0.033
Faculty head interaction	0.161	0.609	0.044	0.557	0.074	−0.018
Faculty round the clock availability	0.258	0.288	0.373	0.459	0.368	−0.165
Academic collaboration	0.365	0.461	0.236	0.179	0.359	0.164
Information about teaching pedagogy	0.011	0.325	0.236	0.187	0.577	0.241
Industry news	0.381	0.077	0.063	0.175	0.714	0.269
Availability of current case studies	0.095	0.226	0.119	0.286	0.694	0.131
Call for papers	0.317	0.192	0.525	0.136	0.557	−0.006
Information about course contents and structure	0.260	0.736	−0.037	−0.016	0.212	0.267
Availability of secondary data	0.316	0.710	−0.047	−0.040	0.234	0.238
Distribution of class notes, exercises and solutions	0.502	0.223	0.461	0.215	0.212	0.078
Sending papers to international/national journals of repute	0.696	0.176	0.414	−0.021	0.233	−0.036
Advertising about academic and cultural events	0.749	0.278	0.248	0.089	0.067	0.243
Sending interoffice memos, official letters and circulars	0.739	0.129	0.023	0.192	0.264	0.225
Submission of reports through e-mail	0.706	0.244	0.184	0.313	−0.018	0.236
Interpretation less cumbersome	0.155	0.024	0.738	0.323	0.149	0.284
Rule-based interpretation of data	0.226	0.048	0.768	0.113	0.136	0.259
Analysis of large data sets	0.224	0.441	0.463	0.176	0.005	0.458
Graphs and flowcharts make interpretation better	0.224	0.136	0.133	0.127	0.337	0.752
Combining different formats of data	0.314	0.236	0.342	0.219	0.025	0.652
Access to data	0.025	−0.043	0.294	0.717	0.362	0.080
Capacity to store data	0.012	0.107	0.202	0.587	0.371	0.424
Reusability of data	0.279	0.150	0.129	0.734	0.067	0.247
Shareability and distribution of data	0.406	0.064	0.054	0.554	0.226	0.384
Make data explicit	0.140	0.391	0.142	0.310	0.226	0.511

6. Discussion

Personal knowledge management was evaluated using the knowledge management diagnostic (KMD) created by Bukowitz and Williams (1999). This diagnostic enables us to know of the KM efforts of an organisation also when these efforts are not called "PKM". The six processes assessed include the basic steps of daily information gathering in the organisations (GET), using knowledge to create value (USE), learning from the value created (LEARN), making the knowledge available for others to use when they encounter similar problems (CONTRIBUTE), assessment of existing knowledge assets (ASSESS) and sharing the knowledge with the others (DIVEST).

The assessment (see Table 4) revealed that the academicians generally performed well in their efforts in creating, finding and collecting internal knowledge and best practices (GET and LEARN). They averaged in sharing and understanding those practices (USE and CONTR) and were weak in adapting and applying the practices to new situations (ASSESS and DIVEST).

Research findings suggest that information systems had definitely given a boost to the creation of new knowledge through the synthesis of data and information captured from diverse sources. It was found that rule-based interpretation of data resulted in better understanding of business behaviour (Joshi *et al.*, 2005), and as a result created tacit knowledge. And when this tacit knowledge took the form of a research paper, a presentation or a case study, it got converted from tacit to explicit.

Table 4. KMO and Bartlett's test.

Kaiser–Meyer–Olkin measure of sampling Adequacy	0.871
Bartlett's test of sphericity	
Approx. Chi-Square	1509.035
df	325
Sig.	0.000

Information, once processed, becomes knowledge and to communicate this knowledge, it has to be codified, and represented. Knowledge which is represented well is understood and communicated better. Knowledge has to be structured and codified to be stored and made available to all. Thus, knowledge representation and codification is

a very important constituent of a knowledge culture which fosters knowledge understanding and leads to knowledge creation. This study reveals that information systems analysis tools do enable combining data from different formats leading to better understanding. Also, information systems communication tools like videoconferencing have made it possible to communicate information through pictures, flowcharts, graphs and charts to make representation better, which was otherwise very difficult to do without information systems tools. The results show that the management faculty was definitely using information analysis tools to reconfigure the existing information through sorting, adding, re-categorising, research and recontextualisation. Thus, we can say that there are definite evidences to the presence of a knowledge-creating culture and positive impact of information systems analysis tools on the knowledge creation processes.

Once knowledge has been created it has to be stored in a knowledge repository so as to make expertise of an organisation accessible to the others and also to integrate learning into the organisation's knowledge base. The information repositories are the document-ware which is made up of the databases, written reports, handbooks, patents and formally documented knowledge held within information systems in the digital form. A knowledge repository is an electronic document system that codifies, stores, disseminates and allows browsing and search of knowledge. Knowledge repositories store the knowledge in soft copy and electronic media and make it available to all. The respondents felt that information systems communication and analysis tools have boosted their capacity to capture more data from the Internet, store it and later use it for analysis. Since human memory is very limited, the computer memory acts as an additional storage space for data which can be reused time and again. Also the data which is stored once can also be shared easily and between many people at the same time. Thus, the reusability of data fosters a more knowledge-sharing environment, and knowledge repositories become a very important constituent of the knowledge culture in an organisation.

The collective fund of information, through content and information aggregators and databases, results in an indexed, interactively searchable and accessible information warehouse. The multi-dimensional space afforded by the mobile age and global networks like mobile Internet networks, create fluid multi-faceted spaces for learning, which can re-enforce and further enhance knowledge dissemination by creating an enriched platform for discourse — an important element of knowledge dissemination. Internet storage through databases and access through communication technologies provides better information dissemination mechanisms in terms of time, cost, responsiveness and reach. The respondents felt that the information storage tools like information databases, library databases enabled them to search for and send papers to the international/national conferences and journals of repute. Class notes, exercises and solutions once uploaded and stored as Internet files, were accessible to any number of students, at any location and at any time.

Once knowledge has been stored and internalised, the organisation's knowledge needs to be accessible to persons who need it, e.g., via its availability in document-ware, through verbal communication within a human network, through databases, etc. The survey revealed that information systems definitely had a positive impact on mapping knowledge across the organisation and enabling access to that knowledge. The Internet is one of the biggest repositories of organised and accessible data. Search engines enable the accessibility of data across the globe and hypermedia software make interoperability possible. Latest trends in the industry and the current business environment news are accessible to one and all. The respondents feel that now they are more at par with global universities in terms of course content and structures because of the open manner in which information is available through the Internet. Thus, the research findings suggest the existence of knowledge accessibility, which is enabled by the information distribution tools.

According to Winter *et al.* (2005) management education programmes often rely on collaborative learning, which requires high levels of openness and interpersonal support. They propose the use of shared understanding to generate new result-oriented activities and the alignment of activities between groups. Information interaction tools like groupware and whiteboards, whereby individuals come together electronically to record their own experiences and learn from others (videoconferencing, whiteboards) enable building knowledge communities, whereby groups of people with a common interest come together to share values, beliefs and ways of doing things. The use of digital business communications facilitate a knowledge culture via the warehousing, transmission and sharing of information through e-mail, videoconferencing, electronic publishing, Internet and Intranet services. Through the tagging and linking of relevant information in an electronic company thesaurus, it is possible for people to access easily any topic of interest. Consequently, the principal contribution of information distribution and communication tools is to connect people via intranets and to help them locate knowledge sources and providers using directories accessed by the intranet. Extranets and

the Internet may connect knowledge workers to external knowledge sources and providers.

While knowledge dissemination is a single-sided emission of information knowledge, sharing is an interactive process. The study showed that information distribution and communication tools boosted communication and knowledge sharing between academic peers, faculty and industry, and between faculty and the head of the institution. Knowledge sharing also took the form of academic collaboration in writing research papers and books and conducting projects, because groupware tools made it possible for collaborating partners residing in geographically dispersed location to collaborate in an efficient manner. Also since secondary data was now available for sharing through hypermedia tools, it was much easier to conduct research. Thus, we can say that information systems tools foster a knowledge-sharing culture in an organisation by means of being more responsive and interactive.

The information about academic and cultural events is difficult and costly to distribute through posters and brochures. Also, the reach of information dissemination about academic and cultural events is limited due to difficulty in distributing information about such events. The respondents felt that information once uploaded and stored as Internet files enabled them to distribute the same information to more number of people, at a lesser cost and in a much lesser time frame. Distribution of inter-office memos, official letters and circulars and reports has also become more efficient and timely with the use of information communication technologies like the e-mail and workgroup collaboration tools like the lotus notes, etc.

The study had proposed that, since the extent of usage of information systems varied with age, there would be an impact of age on the knowledge behaviour of academicians. There was found to be no correlation between the age of the academicians and knowledge behaviour of the academicians. There was found to be small but significant negative correlation between age and the factor 2: DIVEST. This seems to suggest that as the age of the faculty member increases, there is a significant trend towards not sharing knowledge.

The study proposed that there would be significant impact of IS usage on the knowledge behaviour of academicians. Again, the null hypothesis was accepted. There was found to be no correlation between the extents to which the faculty used IS in their day to day activities and the knowledge behaviour of academicians. There was found to be a small but significant negative correlation between academicians with doctorate/MPhil/MTech degrees and the Factor 1: CONTRIBUTE. This seems to suggest that academicians with higher qualifications have a lower tendency to contribute to the knowledge body.

The study also proposed that there would be significant impact of the experience of the academicians and their knowledge behaviour. There was found to be no correlation between the experience of the faculty members and their knowledge behaviour.

7. Conclusion

The study shows that information systems do have a positive impact on the knowledge activities in an educational institution by means of providing a medium for knowledge acquisition, sharing, storing, disseminating and communication. Since a lot of research is going on in the fields of education and knowledge management, it becomes imperative for educational institutions to understand the impact of information technology tools on the knowledge environment which in turn fosters knowledge management. The study gives insights into the way faculty members are doing knowledge management without being aware of it, and the integration of information technology tools should be encouraged by the authorities.

When trying to manage organisational knowledge, various types of IT-based systems have been devised, seemingly without much concern on the impact of information activities on the knowledge management in an organisation. Knowledge capture and creation is not a disjointed single time effort but a process which is nurtured through the right environment and organisational mindset and culture. The study tries to draw a relationship between information and knowledge and identify the various components of PKM and knowledge behaviour of academicians. Actions such as information creation, information seeking and information interpretation can successfully be performed in knowledge environments. To facilitate this, information structures must be designed to support not only the informational aspects but also include people by making salient networks of users with similar interests and allow these to communicate and collaborate.

The results of this study suggest certain information structures that facilitate PKM. Such studies will be useful in understanding and guiding the academicians in their efforts to create, share, and learn from information, experience and insight, and as a result be able to better manage their personal knowledge.

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