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Information literacy at work: A study on information management behaviour of Kuwaiti engineers

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Information literacy at work

A study on information management behaviour of Kuwaiti engineers

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Abstract

Purpose – The purpose of this paper was to investigate the information behaviour of Kuwaiti engineers with a focus on information sources and finding information from these sources, management of information found and re-finding of information from personal collections.

Design/methodology/approach – Survey method of research was used to conduct the study. Data were collected using online questionnaire and interviews with a selected number of participants.

Findings – Results indicated that engineers collected and received information from a variety of sources. They saved selected information for future use in folders and structured them by using work-related categories. Use of information management tools was not common. A majority of participants expressed the need for training courses in information literacy. They felt that lack of institutional support to facilitate access to information was considered a major difficulty in information seeking.

Originality/value – No similar study could be found in the literature, as earlier studies either investigated personal information management practices or information seeking behaviour. This study looked at information literacy in a wider context.

Keywords Information literacy, Information management, Library, Electronic library

Paper type Research paper

Introduction

To more effectively use the vast amount of information available resulting from the explosion of digital resources, such as websites, repositories and social media, professionals need appropriate information finding and re-finding skills. It is important that they not only deploy appropriate strategies for selecting information sources and eliciting relevant information from them but also manage the information they retrieve in a way that it is easy to re-find in the future. Effective information management behaviour and proficiency in the use of relevant tools can be helpful in developing these skills and enhancing information literacy in the workplace.

The researchers conducted the study to investigate the information management behaviour of Kuwaiti engineers with a focus on information finding and re-finding. The study covered three aspects of information behaviour:

(1) information sources and finding information within these sources;

(2) management of the information found; and

(3) re-finding of information from personal collections.

The following research questions guided the study:

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RQ1. From what sources do engineers collect and retrieve/receive information?

RQ2. What methods do engineers use to save and manage information?

RQ3. How comfortable are engineers in finding information related to their field?

RQ4. What strategies do engineers consider important in re-finding information?

RQ5. What are the main obstacles to information finding and management for engineers?

Conceptual framework

Several studies have highlighted the need for improving information seeking processes. Kuhlthau (1991) and Dervin (1998) discussed these processes with the intent to improve information literacy skills, while Wilson (1999) highlighted the need for studies on use and users to understand information behaviour better. Wilson (2000) also looked at information behaviour as the totality of human behaviour in relation to sources and channels of information, including information seeking and information use. Choo *et al.* (2000) described three components of information behaviour: information needs, information seeking and information use, and Case (2007) asserted that information behaviour encompasses information seeking and other unintentional or passive behaviours. These studies demonstrate that, to improve professionals' information literacy, information seeking needs to be examined in a wider context, including relevance and quality of information, skills to extract information related to specific tasks and the ability to access information for use immediately or its potential use in a future task.

Engineering is an interdisciplinary field that poses unique challenges in identifying, evaluating, acquiring and using information, as knowledge of information resources in more than one discipline is often necessary. Information can be in various formats and may require manipulation and knowledge of specialized software. In addition, familiarity in experimentation, laboratory research and mechanical drawing may also be necessary (Riley *et al.*, 2009; Denick *et al.*, 2010).

A number of studies have investigated the information seeking behaviour and information needs of engineers in different fields (Weiner, 2011; Fidel and Green, 2004; Hertzum, 2002; Anderson *et al.*, 2001). These studies emphasized that, for engineers to be information literate, they should know how to determine the scope of information needed, access the information needed effectively and efficiently, evaluate the sources and use the information appropriately (both ethically and legally).

Engineers have very specific information needs, and as the complexity of their work increases, so too does the complexity of their information seeking behaviour. Du Preez (2007) highlighted that the information needs of engineers are constantly changing. Engineers consume information to produce physically encoded information on a particular product or service for clients. Their different roles require searching for a variety of information, such as research and development, design and testing, and manufacturing and construction. In addition to technical information, engineers also need economic, marketing, legal and social information.

Hertzum (2002) indicated that engineers look for sources that are perceived to be of high quality and technical in nature. The more experience an engineer has with a specific source, the more accessible it is perceived to be. Engineers rely on internal

sources of information (e.g. reports, drafts, benchmark test results and colleagues) and external sources (e.g. consultants, vendors and customers). Bibliographic databases and information systems are also among the preferred sources of information for engineers.

Fidel and Green (2004) stated that engineers rely heavily on interpersonal communication with their colleagues as part of their information behaviour. Du Preez and Meyer (2011) indicated that, at the initial stage of a project, engineers depend on the sources available to the project team but consider information gained from personal contacts as being more reliable that information from other sources. These personal sources of information include clients' needs, engineers' experiences and colleagues' designs and technical reports. Therefore, it is essential to create a social network for engineers that provides a place to share information and enables collaboration among members of a project team.

Engineers also depend on a personal store of technical information (Hertzum and Pejtersen, 2000). Anderson *et al.* (2001) specified major factors that influence the selection of information sources and noted that the main consideration was accessibility, which meant that engineers relied on sources that required the least effort. The task in hand was also a major consideration, as identifying appropriate sources depended on the task complexity and level of uncertainty. Du Preez and Fourie (2010) emphasized that characteristics such as the quality, availability and accessibility of the information sources also played a vital role for engineers and influenced their information needs. Engineers were also more likely to seek information from familiar sources repeatedly rather than seeking it from new sources (Du Preez and Fourie, 2010).

Most previous studies on information needs focused on information sources, information seeking and information use, with only a few covering aspects of information management (Jones and Karger, 2006; Jones and Teevan, 2007; Jones, 2008). In general, information management has not been examined as part of information behaviour; however, we believe that in the digital environment, it should be included alongside information seeking. This will make information literacy at work more meaningful.

Recent studies have emphasized the need for special processes to handle digital information. Zhang *et al.* (2010) pointed out that with the growth and increasing complexity of digital resources, individuals must use different approaches to organize and retrieve information required for both personal and professional tasks. More effective management has become essential due to the overwhelming amount of information being produced and disseminated in the digital environment. In today's information age, storage and organization of information for re-use is a significant challenge, especially re-finding information from web-based sources. Specific web pages, entire websites and even small pieces of semi-structured information can be difficult to re-locate at a later time. Deng and Feng (2011) described that while most search tools help users initially find information, they do not provide support when users attempt to re-find the same piece of information.

It is also important to examine the link between information literacy and personal information and knowledge management. Cahoy (2013) stated that it was crucial for employees to learn how to manage their information for future research needs, such as storing collected information in a personal archives system for future needs. The re-finding of information can be enhanced by using proprietary tools such as Dropbox,

Endnote, Bibliographic Citation Manager and other simple tools that can ease information management for users.

Information management focuses on storage, organization and retrieval of information needed by individuals (Bergman *et al.*, 2004), and is a key factor in engineers completing various tasks efficiently. Chaudhry (2013) stated that proper information management can help control information overload and facilitate future finding of the information within a short timeframe. The importance of information management behaviour can be reinforced by providing organizational schemes, such as personal taxonomies to facilitate e-document location in personal collections.

Proper information management is expected to facilitate the re-finding of information (Elsweiler, 2007). The most important stage after first finding the information is being able to re-find it in a short amount of time; however, there are many obstacles to re-finding information. Re-finding can require specific information for a single resource, information for tasks that require a single complete source, or involve tasks that require information from multiple sources.

One of the reasons that users experience difficulties in re-finding information is that they do not manage information in simple and effective ways (Boardman and Sasse, 2004). Information should be managed effectively to be retrieved easily in the future. Cross-checking tools in personal information management play an important role in collecting and managing data, such as files, e-mails and bookmarks. The proper usage of these tools in information management will lead to quick re-finding of information in a short amount of time and with less effort. Khoo *et al.* (2007) and Zhang and Twidale (2012) reviewed the personal folder organization of different professional groups but did not link their findings to information literacy, whereas Zhang *et al.* (2010) examined information literacy focusing on environmental scanning.

Our study examined information seeking and information literacy from a broader perspective and in a wider context. Building on previous research, we address the fact that with the emergence of digital information and social networks, professionals became more dependent on their own information finding techniques rather than delegated information searches. In addition, information became available to them via e-mails from colleagues and postings on sites, such as Facebook and Twitter. It has, therefore, become important that professionals view information finding in a different context. Information should also be evaluated for its potential use in the future and be stored properly to facilitate re-finding. Personal information management tools and techniques can be helpful in managing personal collections of information and re-finding items when needed. A conceptual framework that guided this study included different aspects of personal information management in addition to information finding as part of information literacy (Figure 1).

Methodology

The survey method of research was used to study the information management behaviour of engineers working in different fields throughout Kuwait. Data were collected using an online questionnaire that was distributed to participants via e-mail. Study participants included engineers working in the corporate sector and companies managed by government agencies, as well as academics working in the field of engineering. A list of names and e-mail addresses was compiled from public directories

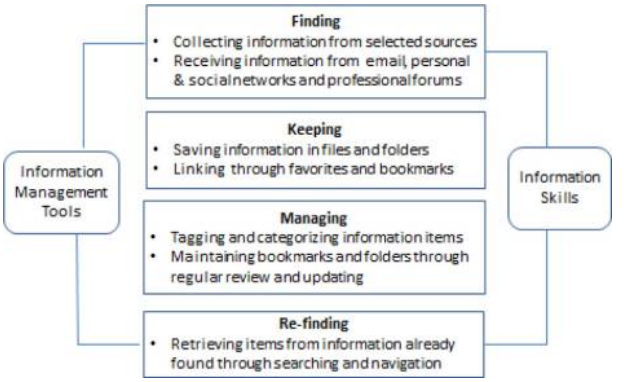

Figure 1.
Information literacy in a wider context

and personal contacts. Out of the 115 engineers invited to contribute to the study, 70 participated, yielding a response rate of about 60 per cent.

The online questionnaire used for data collection contained 13 questions. Five questions were about information sources while six were about information management and re-finding. The last two questions collected demographic information of the participant.

Respondents were also asked about their willingness to participate in follow-up interviews about information management behaviour and approximately 33 per cent agreed. An interview guide was prepared to conduct the semi-structured interviews, which sought additional information on prior questions and possible clarifications on previous answers. Interviewees were specifically asked about information overload, most trusted information sources, tools used to manage information and steps perceived as necessary to enhance information literacy. Information collected through the interviews provided valuable qualitative data that have been helpful in discussing the findings. These also served as a triangulation mechanism, as interviewees were more specific and candid in their answers during the interviews, offering suggestions on how best to discuss our findings and expand the conclusions.

Results

Participant demographics

More than 75 per cent of engineers who responded to the questionnaire hold a bachelor's degree, while about 23 per cent had completed master's studies in their respective engineering fields. More than 62 per cent were female with five or fewer years of work experience. The majority (65.15 per cent) of participants were aged 30 years or younger.

The majority of participants were practicing engineers working for private companies in the oil and telecommunication sectors. A small number, however, were employed in government departments.

Information sources

Participants were asked to indicate the frequency of use of selected types of information sources to collect work-related information. Frequency was reported on a scale of 1 to 5 (1 = infrequent and 5 = most frequent). Participant responses are summarized in Table I.

Information source	*N*	Mean	SD
Websites	69	4.32	1.157
Personal documents (papers and e-contents)	69	3.68	1.131
Professional colleagues	68	3.66	1.087
Technical reports	69	3.62	1.226
Databases	67	3.13	1.381
Conference papers	68	2.96	1.365
Libraries and information centers	69	2.88	1.409
Scholarly journals	69	2.75	1.479
Institutional repositories	68	2.63	1.233
Blogs	69	2.55	1.420

Table I. Sources used to collect information

As shown in Table I, websites were at the top of the list of information sources used to collect work-related information (4.32 mean score), followed by personal documents (3.68 mean score) and professional colleagues (3.66 mean score). Databases were also frequently searched to find engineering information (3.13 mean score).

Participants were also asked to report the sources of information that was sent to them (i.e. "pushed") on a regular basis. They reported the following sources as the most frequent:

- e-mail attachments from professional forums;
- documents forwarded by colleagues;
- information sent through social networking sites; and
- information sent by vendors.

Engineers who participated in the study frequently received information via e-mails sent from professional forums. They also received documents from their colleagues, while social networking sites were only the third most frequent source from which the engineers frequently received information.

Of the engineers who were interviewed, 8 out of 20 expressed frustration regarding information overload. They said that information overload was causing difficulties in being able to re-find the needed information.

Participants also expressed which characteristics they perceived as important regarding the quality of information. Importance was indicated on a scale of 1 to 5 (1 = less important and 5 = most important). Their responses are summarized in Table II.

Characteristic	*N*	Mean	SD
Are from trusted sources	69	4.25	0.946
Based on research	69	4.22	0.983
Are updated on a regular basis	68	3.96	1.112
Are from well-known databases	69	3.78	0.968
Are produced by reputable academics	68	3.76	0.964
Are from reputable sources	69	3.75	0.976
Report practical steps	69	3.70	0.990

Table II. Important characteristics of information sources

As shown in Table II, engineers considered that information produced by trusted sources was most useful to them, as this obtained the highest mean score. They also attached importance to sources where information was based on research (4.22 mean score) and to those sources that were updated regularly (3.96 mean score). Their perceptions about these characteristics of information sources were corroborated when the following were reported as the most frequently used databases:

- Applied Science and Technology Index/Abstracts/Full Text.
- ProQuest Dissertations and Theses Full Text: Science and Technology.
- CSA Engineering Research Database.
- Petroleum Abstracts.
- Engineering Village.
- Energy Citations Database.
- DAAI: Design and Applied Arts Index.

Participants were asked to choose which sources they trusted most for finding work-related information, indicating the level of trust on a scale of 1 to 5 (1 = least trusted and 5 = most trusted). Their responses are summarized in Table III.

As shown in Table III, academics and engineering databases were considered the most trusted information sources by the majority of study participants. These two sources yielded the highest mean scores, 4.16 and 4.00, respectively. During the follow-up interviews, engineers listed the following as the most trusted information sources:

- refer to professional colleagues = 6;
- refer to previous projects = 5;
- websites = 5;
- databases = 3;
- library = 3; and
- company portal = 3.

Online journals, e-books and Google were mentioned as trusted sources by one engineer within the above categories.

Information management

As stated earlier, storing selected information for future use and ensuring that it is organized properly for re-finding is critical in the digital information age. Participants were asked to

Table III. Trusted sources of information

Source	*N*	Mean	SD
Academics in your field	69	4.16	0.980
Engineering databases	69	4.00	0.985
Project reports	69	3.93	1.034
Articles from journals	68	3.78	1.183
Colleagues from professional forums	69	3.64	0.985
Colleagues at work	69	3.58	0.898
Information downloaded from websites	69	3.38	1.189

indicate which methods they used to keep (or save) digital information or e-content for future use. They reported the frequency of keeping information on a scale of 1 to 5 (1 = least frequent and 5 = most frequent). Their responses are summarized in Table IV.

As shown in Table IV, the most popular methods of saving information for future use were saving it in folders or e-mailing it to themselves, as these methods obtained a mean score of higher than four. Use of outside services and adding to a personal portal were revealed to be less popular methods.

A myriad of tools are currently available to professionals to help manage information in personal collections. Participants were asked to indicate their use of such tools to manage information. They indicated the frequency of applying different methods on a scale of 1 to 5 (1 = least frequent and 5 = most frequent). Their responses are summarized in Table V.

As shown in Table V, engineers who participated in the study used search, personal information management and e-mail management tools most frequently, as these tools yielded the highest mean scores (i.e. more than three). Concept and mind mapping and specialized drawing tools, however, were not very frequently used.

Several engineers stated during the interviews that awareness about the need for information management should be promoted among engineers, particularly those who work on special projects. These engineers also suggested that it would be helpful if at least one project team member is assigned the responsibility for information management, to encourage others to pay more attention to information management during the project. Only 3 out of 20 engineers who were interviewed mentioned that they were using management tools.

Information finding and re-finding

Participants were asked to indicate how comfortable they were in finding information. They assessed their information finding skills on a scale of 1 to 5 (1 = not effective and 5 = very effective). Their responses are summarized in Table VI.

Method	*N*	Mean	SD
Save in personal folders on the desktop	68	4.43	0.967
E-mail it to yourself	68	4.10	1.148
Bookmark or add a Favorite on your desktop	68	3.90	1.259
Save the URL to search when needed again	68	3.29	1.394
Store on outside services (Dropbox and GoogleDocs)	68	2.76	1.585
Upload to personal portal	67	2.58	1.616
Add a hyperlink to a personal web page	67	2.09	1.300

Table IV. Methods used to keep information for future use

Tool	*N*	Mean	SD
Search tools that help mine local and networked drives	68	3.88	1.228
Information management tools that help organize calendars, tasks and schedules	68	3.40	1.199
E-mail management tools that help mitigate message overload	68	3.12	1.451
Concept and mind mapping tools that help organize and connect information	68	2.90	1.405
Specialized tools (GNOME, SmartDraw and Hystack)	68	1.78	1.183

Table V. Tools used for managing personal information collections

Table VI.
Information finding skills

Skill level	*N*	Mean	SD
I know when to use web-based and when to use specialized sources (databases, digital repositories, etc.)	68	4.09	0.958
I am able to select the right information from my specialized area as well other relevant sources	66	4.05	0.867
I can assess the quality of information reasonably well (can distinguish between views, opinion, facts, advocacy, etc.)	68	4.01	0.889
I possess searching skills to be able to ask focused questions	68	3.96	0.937
I am comfortable in using databases that were created for the engineering field	68	3.88	1.000
I can integrate and synthesize information from various sources to create new knowledge	68	3.84	1.045

As shown in Table VI, participants expressed an ease in information finding, as the mean scores for all listed skills were quite high. The engineers reported that they were confident in selecting appropriate information sources, were able to select relevant information from specialized sources and could comfortably assess the quality of information found.

During the interviews, however, several engineers highlighted the need for information literacy enhancement. Four engineers suggested that "Kuwait University should have an information literacy course for all colleges. Students should gain information literacy skills before graduating and entering a professional career". One engineer suggested that "there should be a manual on information literacy skills about how to search, manage, and re-find information effectively".

Participants were asked to indicate their agreement with specific statements regarding re-finding information. They indicated their agreement on a scale of 1 to 5 (1 = disagree and 5 = strongly agree). Their responses are summarized in Table VII.

Mean scores listed in Table VII indicate that most strategies followed in re-finding information were effective. Engineers appeared to be aware of the importance of organizational schemes and personal information techniques in re-finding information. They also appeared to have little difficulty in finding information saved in folders or linked through bookmarks.

During interviews, one engineer stated that out of the eight hours he spent at work, five were spent in re-finding needed information. He added that this could have been

Table VII.
Strategies for re-finding information

Strategies	*N*	Mean	SD
Proper organizational schemes and personal information management tools make information re-finding easier	68	3.91	1.181
I am always able to find information saved in personal folders	68	3.87	1.078
I have no problem finding previously saved information through bookmarks and favorites	68	3.84	1.074
It is easier to search again instead of going through the saved information	67	2.55	1.294
Information saved for future use is rarely needed	68	2.49	1.240
It is more difficult to find information the second time	67	2.28	1.042

reduced if there was a shared system for information management. Three other engineers also suggested the implementation of a shared information management system across teams to better manage project information in one place that is accessible to all relevant employees.

Participants were asked about the major barriers (or difficulties) in finding and accessing work-related information. They were asked to select multiple options if applicable. Their responses are summarized in Table VIII.

Participants felt that institutional support to facilitate access to relevant information sources was not adequate, as 46 out of 68 reported this as a major difficulty. Many engineers also felt that they were confronted with information overload. It was interesting to note that even though participants expressed satisfaction about their information finding skills in a question that appeared early in the survey, 30 participants listed lack of information literacy skills in a later question as one of the major difficulties in finding work-related information.

During the follow-up interviews, most engineers emphasized the need for training in information literacy and suggested that these courses should be mandatory for all employees. Some highlighted that such courses should be taken during an educational program (i.e. before entering the workforce) to build a firm foundation.

Engineers who were interviewed showed enthusiasm about the study of information management behaviour and suggested that findings of this research be brought to the attention of top management in relevant companies. Going further, they suggested that recommendations be made towards improving skills and capabilities related to information management, such as attending training workshops and short courses focused on the use of personal information management tools and enhancing search skills.

Conclusions

Complex tasks, functional variables and the multiplicity of work environments require engineers to be comfortable in finding and managing information. Most previous studies focused on seeking and using information, while this study focused on the information management behaviour of engineers. Participants reported that they were collecting and receiving information from a variety of sources, including websites, institutional repositories, colleagues and professional forums and e-mail attachments. However, academics and specialized databases were considered the most trusted information sources by the majority of engineers surveyed. Results also indicated that information based on research and updated regularly by these trusted sources was considered most useful.

Table VIII. Difficulties in finding work-related information

Difficulty	Frequency	(%)
Lack of institutional support to access information sources	46	30.9
Lack of proper tools to facilitate information searching	36	24.2
Information overload	34	22.8
Lack of information literacy skills	30	20.1
Lack of easy methods to save and re-access information	1	0.7
Incompetent or untrained colleagues	1	0.7
Language	1	0.7

Most engineers considered it important that information they collect and receive to perform various tasks should also be saved appropriately for future use. The most popular methods for doing so were personal folders or e-mailing the information to themselves. Use of outside services and adding to a personal portal were revealed to be less popular methods. Engineers who participated in the study used search and personal information management and e-mail management tools quite frequently; however, concept and mind mapping and specialized drawing tools were seldom used.

Engineers expressed ease in finding work-related information and reported that they were confident in selecting appropriate sources and specialized information from these sources. They were also comfortable with assessing the quality of information found. Overall, strategies suggested in the survey to re-find information were successful, and engineers were aware of the importance of organizational schemes and personal information techniques in re-finding information. While they appeared to have little difficulty in finding information saved in folders or linked through bookmarks, they felt that institutional support to facilitate access to relevant information sources was not adequate. As such, the majority agreed that they were confronted with information overload. They also listed lack of information literacy skills as one of the major difficulties in finding work-related information.

References

Anderson, C., Glassman, M., McAfee, R. and Pinelli, T. (2001), "An investigation of factors affecting how engineers and scientists seek information", *Journal of Engineering and Technology Management*, Vol. 18 No. 2, pp. 131-155.

Bergman, O., Boardman, R., Gwizdka, J. and Jones, W. (2004), "Personal information management", *proceeding (CHI) EA ' 04 Extended Abstracts on Human Factors in Computing Systems*, ACM, New York, NY, pp. 1598-1599.

Boardman, R. and Sasse, M. (2004), "Stuff goes in to the computer and doesn't come out: a cross-tool study of personal information management", *Proceedings of the SIGCHI Conference on Human Factors in Computing System*, *New York, NY*, pp. 583-590.

Cahoy, E. (2013), "Affective learning and personal information management", *Communication in Information Literacy*, Vol. 7 No. 2, pp. 146-149.

Case, O. (2007), *Looking for Information: A Survey of Research on Information Seeking, Needs, and Behavior*, 2nd ed., Academic Press, Amsterdam.

Chaudhry, A.S. (2013), "Information management strategies of knowledge workers in the public sector in Kuwait", *Libri: International Journal of Libraries and Information Services*, Vol. 63 No. 2, pp. 149-158.

Choo, W., Detlor, B. and Turnbull, D. (2000), *Web Work: Information Seeking and Knowledge Work on the World Wide Web*, Kluwer Academic Publishers, Dordrecht.

Deng, T. and Feng, L. (2011), "A survey on information re-finding techniques", *International Journal of Web Information Systems*, Vol. 7 No. 4, pp. 313-332.

Denick, D., Bhatt, J. and Layton, B. (2010), "Citation analysis of engineering design reports for information literacy assessment", *Proceedings of the 2010 American Society for Engineering Education Annual Conference and Exposition*, *Louisville, KY*.

Dervin, B. (1998), "Sense-making theory and practice: an overview of user interests in knowledge seeking and use", *Journal of Knowledge Management*, Vol. 2 No. 2, pp. 36-40.

Du Preez, M. (2007), "Information needs and information seeking behavior of engineers: a systemic review", *Mousaion*, Vol. 25 No. 2, pp. 72-94.

Du Preez, M. and Fourie, J. (2010), "Development of a conceptual model for studying engineers' information behavior", *Mousaion*, Vol. 28 No. 1, pp. 62-88.

Du Preez, M. and Meyer, H. (2011), "Exploring conceptual models to study consulting engineers' social networks", *Mousaion*, Vol. 29 No. 2, pp. 75-94.

Elsweiler, D. (2007), "Towards task-based personal information management evaluations", *SIGIR '07 Proceedings of the 30th Annual International ACM SIGIR Conference on Research and Development in Information Retrieval*, ACM, *New York, NY*, pp. 23-30.

Fidel, R. and Green, M. (2004), "The many faces of accessibility: engineers' perception of information sources", *Information Processing and Management*, Vol. 40 No. 3, pp. 563-581.

Hertzum, M. (2002), "The importance of trust in software engineers' assessment and choice of information sources", *Information and Organization*, Vol. 12 No. 1, pp. 1-18.

Hertzum, M. and Pejtersen, A. (2000), "The information seeking practices of engineers: searching for documents as well as for people", *Information Processing & Management*, Vol. 36 No. 5, pp. 761-778.

Jones, W. (2008), *Keeping Found Things Found: The Study and Practice of Personal Information Management*, Morgan Kaufmann, San Francisco, CA.

Jones, W. and Karger, D. (2006), "Data unification in personal information management", *Communication of the ACM*, Vol. 49 No. 1, pp. 77-82.

Jones, W. and Teevan, J. (2007), *Personal Information Management*, University of Washington Press, Seattle, WA.

Khoo, C.S.G., Luyt, B., Ee, C., Osman, J., Lim, H.-H. and Yong, S. (2007), "How users organize electronic files on their workstations in the office environment: a preliminary study of personal information organization behavior", *Information Research*, Vol. 12 No. 2, p. 5.

Kuhlthau, C. (1991), "Inside the search process: information seeking from the user's perspective", *Journal of the American Society for Information Science*, Vol. 42 No. 5, pp. 361-371.

Riley, D., Piccinino, R., Moriarty, M. and Jones, L. (2009), "Assessing information literacy in engineering: integrating a college-wide program with ABET-driven assessment", Proceedings of the 2009 ASEE National Conference, Austin, Texas.

Weiner, S. (2011), "Information literacy and the workforce", *Education Libraries*, Vol. 34 No. 2, pp. 7-14.

Wilson, T.D. (1999), "Models in information behavior research", *Journal of Documentation*, Vol. 55 No. 3, pp. 249-270.

Wilson, T.D. (2000), "Human information behavior", *Informing Science*, Vol. 3 No. 2, pp. 49-55.

Zhang, H. and Twidale, M. (2012), "Mine, yours and ours: using shared folders in personal information management", *Personal Information Management Workshops*, available at: http://pimworkshop.org/2012/pdf/zhang_2012_mine.pdf

Zhang, X., Majid, S. and Foo, S. (2010), "Environmental scanning: an application of information literacy skills at the workplace", *Journal of Information Science*, Vol. 36 No. 6, pp. 719-732.

Further reading

Chaudhry, A., Rehman, S. and Al-Sughair, L. (2014), *Digital Information Management Practices in the Kuwaiti Corporate Sector: Final Report Project No. OI06/12*, Kuwait University, Kuwait City.

Godbold, N. (2006), "Beyond information seeking: towards a general model of information behavior", *Information Research*, Vol. 11 No. 4, available at: http://InformationR.net/ir/11-4/paper269.html

Leckie, G., Pettigrew, K. and Sylvain, C. (1996), "Modeling the information seeking of professionals: a general model derived from research on engineers, health care professionals and lawyers", *Library Quarterly*, Vol. 66 No. 2, pp. 161-193.

O'Farrill, R.T. (2008), "Information literacy and knowledge management: preparations for an arranged marriage", *Libri: International Journal of Libraries and Information Services*, Vol. 58 No. 3, pp. 155-171.

O'Farrill, R.T. (2010), "Information literacy and knowledge management at work: conceptions of effective information use at NHS24", *Journal of Documentation*, Vol. 66 No. 5, pp. 706-733.

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