

Personal information management (PIM), reference management and mind maps – the way to creative librarians?

Ina Fourie

Department of Information Science, University of Pretoria, Pretoria

Please note, this is not the final version that appeared in Library Hi Tech

Abstract

Purpose – The column explores the potential of personal information management (PIM) and reference management. This contribution focuses on combining the use of PIM and reference management software with mind maps to stimulate the creative and innovative use of information collected. Following a brief review of the literature on the topic *per se*, awareness is raised of appropriate software and the potential of mind maps.

Design/methodology/approach – The column is written against the background of research from information behaviour, PIM, mind maps, creativity, innovation and the reflective and evidence-focused librarian.

Findings – There is growing emphasis on more than information literacy skills and the responsible use of information. Creative and innovative use of information is stressed. More intensive use and exploitation of information is necessary to justify the time and effort spend in using PIM and reference management software. Mind maps and collaboration might support creative and innovative use of information, and need to be further exploited. Although software is strong in supporting collaboration, there is very limited build-in support for the combination of features for information and reference management with features for mind maps.

Originality/value – Although much has been published on developments in PIM and reference management, there is limited coverage of combining PIM and reference management with the use of mind maps and creativity, reflection and noting evidence.

Keywords – Computer software, Creativity, Information, Information management, Innovation, Librarians, Mind maps

1. Introduction

In previous contributions Fourie (2011a, b) sets the tone for the importance of exploring the use of personal information management (PIM) and reference management and the role of librarians, as well as the use of alerts in this regard. These contributions also stress the importance of collaboration in seeking and monitoring information (i.e. using alerts) and in exploring the creative and innovative use of information. Calls for librarians to be creative and innovative are nothing new. According to Walton (2008) both concepts have been discussed in the library and information science literature over many years: “Creative ideas are used to provide value and ensure unmet gaps and needs are addressed. Innovation is the process that applies the creativity” (Walton 2008:125). Olson (1999:383) argues that “Librarians need to explore their individual creativity. Creative thinking is an underutilized problem-solving skill that can be learned and applied to any situation”.

In fields other than Library and Information Science, the value of information collections for creativity has also been noted. Muldrow and Yoder (2009) report on how reference managers are taking research to the next level. They argue: “Political scientists labor at the peripheries of their given fields to revolutionize current understandings about politics, yet the

processes by which they store and share their knowledge remains firmly orthodox. No longer! Today the technology exists to change how we review past literature, how we save and organize our research, and how we share and collaborate on projects with our colleagues. Ready adoption of that technology will move us ever closer to resolving the existing duality between the revolutionary goals of our research, and its bourgeois processes. So, join our revolution comrades; you have nothing to lose but your (paper) chains!" They are offering this insight in the context of reference management.

Librarians promoting the use of PIM and reference management need first-hand experience of its potential to stimulate idea generation, bring associations between concepts to the front, and highlighting trends and gaps in the subject field. With regard to creativity and innovation, mind maps immediately come to mind. In an excellent monograph on PIM Jones (2008:265) briefly mentions the use of mind maps – without going into detail on the use of mind mapping software, etc., which was not the intention of his discussion. Mind mapping can be associated with meta activities that follow after the collection and organisation of information (Jones & Teevan, 2007:17, 270), might add value to information collected, and might help with making sense of the information collected.

This contribution will focus on the use of mind mapping software in combination with PIM. The following will therefore be covered: clarification of key concepts, a brief review of the literature on the topic *per se*, awareness of appropriate software, and the potential of mind maps. It will be concluded with suggestions on how librarians can take this further.

2. Clarification of concepts

Although there are many definitions of PIM, the following definition is widely cited: "Personal information management or PIM is both the practice and the study of the activities people perform to acquire, organize, maintain, retrieve, use, and control the distribution of information items such as documents (paper-based and digital), Web pages, and email messages for everyday use to complete tasks (work-related and not) and to fulfil a person's various roles (as parent, employee, friend, member of community, etc.) (Jones and Teevan, 2007:3).

A mind map is a tool that can support cognitive processes such as thinking, problem-solving, idea generation, categorisation, representation, vocabulary exploration, and visualisation. According to Buzan (2006:12) "Mind maps are a method for storing, organizing and prioritizing information (usually on paper) using Key Words and Key Images, each of which will trigger specific memories and encourage new thoughts and ideas". It can be used for any possible topic or activity such as deciding on research methods for studies on information behaviour, planning information literacy training programs, and exploring the potential of mobile access to information. It can be used for information from any source or combination of sources as would be the case with PIM and reference management – books, articles, lecture notes, meetings, and one's own head (Buzan 2006:14). In *Understanding mind maps* by Morris and Smith (1998:13) mind maps are noted as "a way of hot-wiring your creative energies" and "a multi-handed thought-ball catcher". I think this spells out very well the reason to consider the use of mind maps to supplement PIM.

Apart from mind maps, concept maps, knowledge maps, and argument maps also feature in the subject literature (Dang *et al.*, 2011; Engelmann and Hesse, 2010; Loss, 2009; Martin and Rice, 2009; Pinto, Douchet, Fernandez-Ramos, 2010; Taylor and Littleton-Kearney, 2011; Tramullas, Sanchez-Casabon and Garrido-Picazo, 2009). For the moment, only the potential of combing mind mapping with the use of PIM and reference management software will be considered.

3. Brief review of the literature

Although librarians are certainly aware of mind maps (Adam and Mowers, 2007; Murley, 2007), these are not often discussed extensively in the literature of Library and Information Science. A quick title search on databases such as ISI Web of Science, Library and Information Science & Technology Abstracts (LISTA), Library and Information Science Abstracts (LISA), ACM Digital Library, and Google Scholar revealed limited coverage of mind maps *per se* with regard to libraries and information services. Even fewer reports were noted on the combination of mind mapping software and creativity with reference management. Beel, Gipp and Muller (2009) report on SciPlore MindMapping as a tool for creating mind maps combined with pdf and Reference Management, and Coughlan and Johnson (2009) on designing personal information management systems for creative practitioners. Engeleemann and Hesse (2010) report on a solution for providing group members access to the knowledge structures and the information resources of their collaboration partners in the form of digital concept maps. Tramullas, Sanchez-Casabon and Garrido-Picazo (2009) offer an elaborate discussion on PIM and the use of concept mapping software. As their article is written in Spanish it is not accessible to me, apart from what can be gathered from a Google translation – which seems a pity in a field which holds so much potential and with so few publications on the issue. With regard to personal knowledge management (PKM), Voelkel and Haller (2009:300) argue the value of conceptual data structures where notes are taken as an external representation for internal concepts. Such notes can serve as external reminders about the knowledge that a person would otherwise forget – a good reason for extending the value of information in a PIM collection.

Mind maps (as well as concept maps, knowledge maps and arguments maps) feature strongly in the literature of education. The following are but a few examples. Dhindsa, Makarimi-Kasim and Anderson (2011) report on a constructivist-visual mind map teaching approach and the quality of students' cognitive structures. Taylor and Littleton-Kearney (2011) argue the value of concept mapping in teaching critical thinking to nurses. Concept maps can also be used to assess the learning needs of knowledge managers and to support them in gaining a holistic picture of their field (Martin & Rice, 2009). In the information science literature Pinto, Doucet and Fernandez-Ramos (2010) report on measuring students' information skills through concept mapping. They analyze the role of concept maps which according to them can serve as a tool to improve information analysis, synthesis, organization and representation skills and competencies. They did an experiment with a group of library and information science students in which they observe, analyse and measure the students' ability to create a concept map, identify the main and secondary subjects, subject codify the concepts, grade and represent the concepts. This adds a new dimension to information literacy and the collection of information and can be extended to include the future use of information (as presented in a PIM).

For more detail on PIM as such *Personal Information Management* edited by William Jones and Jaime Teevan (2007) and *Keeping found things found* by William Jones (2008) is worth reading, bringing to the front the many dimensions and complexities of PIM, its potential over a lifetime, group information management (GIM) as well as reasons for gaining additional value from PIM.

4. Software for PIM and reference management and mind maps

When thinking of combining mind maps with the use of PIM, it can be done in different ways: (1) mind mapping features/facilities integrated with PIM software; (2) mind mapping software with features/facilities for accommodating reference management; and (3) manual integration e.g. using separate mind mapping software in addition to PIM or reference management software, and of course, good old fashioned pen and paper (Buzan, 2006).

4.1 Selected examples of PIM and reference management software

A wide variety of software is available for PIM and reference management. Although PIM is sometimes associated with personal calendars and appointments the emphasis here is on software supporting the organisation and management of documents such as journal articles, books, conference papers, email, and photos. In academic contexts, popular examples include EndNote (<http://www.endnote.com/>), Reference Manager (<http://www.refman.com/>), RefWorks (<http://www.refworks.com/>), Zotero (<http://www.zotero.org/>) (free). There is also Citavi (<http://www.citavi.com/>) (free version for up to 100 references), WizFolio (<http://wizfolio.com/>) (also offering an ipad version; <http://help.wizfolio.com/Contents/iPAD.aspx>), Connotea (<http://www.connotea.org/>) (free tool especially aimed at clinicians, researchers and scientists), JabRef (<http://jabref.sourceforge.net/>) (free) or Mendeley (<http://www.mendeley.com/>) (free with versions for iphone and ipad; <http://www.mendeley.com/#mobile>), TreePad (<http://www.treepad.com/>). More examples of PIM software can be found on Wikipedia (http://en.wikipedia.org/wiki/Comparison_of_reference_management_software). None of these are explicitly referring to mind maps or any of the other possibilities to stimulate creativity.

4.2 Examples of mind mapping software

A wide variety of mind mapping software is available for free or for purchasing. The emphasis is on stimulating innovative ideas, sharing and collaboration through various means; some even took up on the use of mobiles and tablets. Examples of software include MindGenius (<http://www.mindgenius.com/>), Mindjet's MindManager (<http://www.mindjet.com/>) (including versions for iphone and ipad; free; <http://www.mindjet.com/mobile-apps>), FreeMind (http://freemind.sourceforge.net/wiki/index.php/Main_Page) (which also allows limited note taking), XMind (<http://www.xmind.net/>), Mind42.com emphasizing collaboration (<http://www.mind42.com/>), MindMeister (www.mindmeister.com), CRPA – constructive recollection (<http://crpa.co/index.html>), Mindomo (<http://www.mindomo.com/>) (collaborative mind mapping and brainstorming application), Freeplane mind mapping (http://freeplane.sourceforge.net/wiki/index.php/Main_Page), Windows 7 mind mapping (www.windows7download.com/free-win7-mind-maps) for examples of Windows 7 free downloads, Rationale (<http://rationale.austhink.com/>) for argument maps supporting critical thinking and argumentation skills, Smartdraw for concept maps and mind maps (<http://www.smartdraw.com/specials/concept-mapping.htm>), Cmap tools (<http://cmap.ihmc.us/download>) for downloads for free, Inspiration and Kidspiration (www.inspiration.com) and WebspirationPro (<http://www.inspiration.com/About-Us/Whats-New#WebspirationPRO-launchare>). Mind mapping software can be supplemented by sticky notes such as TurboNote.com (<http://turbonote.com/>), and software for capturing ideas e.g. Evernote (<http://evernote.com/>) and Microsoft Onenote (<http://office.microsoft.com/en-us/onenote/>).

Very few of the available software include PDF readers and integration with PIM or reference management software or vice versa. SciPlore (http://www.sciplore.org/software/sciplotre_mindmapping/) seems an exception. It was originally known as *Scienstein* and started in 2008 as a project of two PhD students Béla Gipp and Jöran Beel, who worked as researchers at the VLBA Lab with Prof. Arndt and Stefan Weidner. SciPlore is described as a mind mapping application written in Java. It is licensed under the GNU General Public License and based on the open source software FreeMind. The focus of SciPlore MindMapping is on combining mind maps with PDF and reference management (Beel, Gipp and Muller, 2009). Associative Scrapbook (<http://www.cs.bath.ac.uk/~tc225/AS/>) discussed by Coughlan and Johnson (2009) is another example of adding value to PIM.

4.3 Features required for mind mapping software to be used with PIM

Effective alignment of mind mapping software with PIM would require special features such as a link for an information source to a node of a mind map which can be done manually or automatically e.g. linking to a PDF file from a mind map with the PDF file again linked to a PIM or reference management database. It might also be possible to drag and drop a PDF with bookmarks for important information to a mind map (Beel, Gipp & Nelson, 2005). Other features may include making notes, working with a variety of software, a compatible operational system, ability to edit ideas around a central concept, support for brainstorming, variety of formats for saving and sharing, formats for exporting and importing, and support for a variety of templates of mind maps e.g. fishbone chart, flow chart, organization chart, and project management, etc, as well as features supporting collaboration.

5 Potential value of mind maps

The value of mind maps for the collection and organisation of information can be derived from the literature as mentioned in section 3, discussions on mind maps *per se*, and the literature on information literacy, information behaviour, the reflecting librarian and practitioner, and evidence-based librarianship (EBLIP). Buzan (2006:18) also adds a good starting point: unlike with taking notes mind maps save us from recording unnecessary words.

Information for personal collections (PIM or reference management) is collected because it is of use for an immediate need such as writing an article or completing a research project, or because it is expected that it might have some future value. Considering the time and effort and even mental workload of collecting and organising information when using different devices or fragmented information (Jones and Teevan, 2007; Tungare, 2009), personal information collection really need to hold some value when putting in even more effort to add value by means of mind mapping. An important issue here would be collaboration and sharing so that not only one person takes on the workload or gain from it, but also for getting the timing right for working on mind maps as a meta activity and specifically focusing on creativity. Walton (2008:129) explains: "The library manager can use creativity as a tool to ensure the library flourishes and develops within this turbulent world. Creativity will not occur spontaneously or without any effort or time but will need the library manager to take responsibility for its manifestation".

According to Buzan (2006:6) mind maps can play an important role in personal development. It "can be a powerful tool for personal transformation and as a way for each of us to make the most of our natural abilities"... "they can be artistic creations in their own right".

There are many reasons for using mind maps; the following are a few suggestions applying more specifically to personal collections of information:

- 1) Noting synonyms for a field of interest as well as relationships and associations between terms that again can point to search terms for adding breadth and depth to information seeking and studies/work in a field. Working on this paper, the following terms come to mind: PIM, personal information management, reference information management, personal information ecosystems (Tungare, 2009:24), personal information landscape, mind mapping, concept mapping, knowledge mapping, topic or subject mapping, and argument mapping. Following mind maps, a next step might be to explore knowledge and arguments maps. Awareness of terms can further be supplemented with vocabulary tools such as thesauri (available through databases, for subscription or for free; the American Society of Indexers offers a useful list;

clusters suggested by search engines such as Yippie, and Google's wonder wheel feature).

- 2) Brainstorming, idea generation and visual thinking. The literature cited here on PIM and mind maps for example bring to mind ideas for further research and teaching such as including argument maps in information literacy courses, evidence on the use of concept maps in information literacy training (in supplement to the article by Pinto, Doucet and Fernandez-Ramos, 2010), librarians' use of mind maps, success stories of using mind maps in libraries, systematic reviews of creativity and information seeking, the impact of visual thinking on research output, case studies of visualisation in teaching information literacy and PIM skills, action research in teaching information literacy and PIM skills, and the ability of mind mapping to show gaps in knowledge and to bring dormant information needs to the front.
- 3) Increasing productivity by creating outlines for projects and papers and saving time in writing out unnecessary words as is the case with note-taking. Mind maps offer a brief method for recording ideas, insights, inspiration and factual information and also for stimulating retention. It can be linked to creating new knowledge such as plotting means for enhancing training in information literacy to more meaningful levels, noting the researchers working on such issues, recording the outcomes (evidence noticed), as well as support from other fields and disciplines such as education (e.g. the Ausubel concept of using advanced organisers, psychology). Tacit knowledge can be transformed into knowledge that can be shared with others if following a system of collaboration and sharing with others. Mind mapping can even be used to explore the possibility for such sharing and collaboration: the strengths, the pitfalls and the manifestations of human behaviour.
- 4) Deepening learning from the subject literature through reflection and regular practice of skills in reflection, problem definition, etc. (This is on assumption that information collection is followed on a regular bases with mind maps). Mind maps might also help in noting gaps in current research and practices that need to be filled.
- 5) Exploring the structure of a field e.g. PIM and reference management can be linked to information organisation (including tagging), collaborative work and learning, collaborative information seeking, information retrieval, software design, software evaluation, etc.
- 6) Enhancing ability to analyse complex information and concepts to find the deeper meaning in definitions, draw comparisons and synthesising information. It can help with making sense (Jones and Teevan, 2007:16-17). For PIM mind maps can e.g. be used to analyse different definitions of PIM as explained in Jones (2008) and Jones and Teevan (2007).

6 Conclusion

The value of PIM has been argued in the literature along with its shortcomings and the time it may require. The need for creativity and innovation in a dynamic society and also for librarians has also been well argued. It thus seems to make sense to explore the possibilities for combining PIM with tools associated with creativity and innovation such as mind maps. This contribution has noted some of the available software as well as the potential value. The challenge, however, lies with librarians to explore the combined use of PIM and mind maps, as well as other possibilities such as concept maps, knowledge maps and argument maps. Action research might offer the best approach to record experiences, to share these, to reflect and to put knowledge into improved practices of PIM as well as the training of library users and clients.

References

Adam, A. and Mowers, H. (2007). "Get Inside Their Heads with Mind Mapping". *School Library Journal*, 2007, Vol. 53 Issue 9, p. 24.

Beel, J., Gipp, B. and Muller, C. (2009), "'SciPlore MindMapping' -- a tool for creating mind maps combined with pdf and Reference Management", *D-Lib Magazine*, Vol. 15 No.11-12, available at: <http://www.dlib.org/dlib/november09/11inbrief.html#BEEL> (accessed 14 September 2011). doi: 10.1045/november2009-inbrief.

Buzan, T. (2006), "*Mind mapping: kick-start your creativity and transform your life*", BBC Active, Essex.

Coughlan, T. and Johnson, P. (2009), "Designing personal information management systems for creative practitioners", *Journal of Digital Information*, Vol.10 No.5, available at: <http://journals.tdl.org/jodi> (accessed 14 September 2011).

Dang, Y. et al. (2011). "Knowledge mapping for rapidly evolving domains: A design science approach". *Decision Support Systems*, Vol. 50 No. 2, pp. 415-427.

Dhindsa, H.S., Makarimi-Kasim and Anderson, O.R. (2011). "Constructivist-visual mind map teaching approach and the quality of students' cognitive structures", *Journal of Science Education and Technology*, Vol. 20 No. 2, pp. 186-200.

Engelmann, T. and Hesse, F.W. (2010). "How digital concept maps about the collaborators' knowledge and information influence computer-supported collaborative problem solving". *International Journal of Computer-Supported Collaborative Learning*, Vol. 5 No. 3, pp. 299-319.

Fourie, I. (2011a), "Librarians alert: how can we exploit what is happening with personal information management (PIM), reference management and related issues? *Library Hi Tech*, Vol. 29 No. 3, pp. 550-556.

Fourie, I. (2011b), "Personal information and reference management: Librarians' increasing creativity", *Library Hi Tech*, Vol. 29 No. 2, pp. 387-393.

Jones, W. (2008), "*Keeping found things found*", Elsevier, Amsterdam.

Jones, W. and Teevan, J. eds. 2007. "*Personal information management*", University of Washington Press, Seattle.

Loss, L. (2009), "Concept maps as a tool for supporting knowledge management in collaborative research projects", *Journal of Information & Knowledge Management*, Vol. 8 No. 3, pp. 201-211.

Martin, N. and Rice, J. (2009), "Concept maps: a technique for assessing knowledge manager learning needs". *Knowledge Management Research & Practice*, Vol. 7 No. 2, pp. 152-161.

Morris, S. & Smith, J. (1998), "*Understanding mind maps in a week*". The Institute of Management Foundation, Northants.

Muldrow, J. and Yoder, S. (2009), "Out of Cite! How reference managers are taking research to the next Level", *PS: Political Science & Politics*, Vol. 42 No. 1, pp. 167-172.

Murley, D. (2007), "Mind mapping complex information". *Law Library Journal*, Vol. 99 Issue 1, pp. 175-183.

Olson, J.A. (1999), "What academic librarians should know about creative thinking". *The Journal of Academic Librarianship*, Vol. 25 No. 5, pp. 383-389.

Pinto, M., Doucet, A-V. & Fernandez-Ramos, A. (2010), "Measuring students' information skills through concept mapping", *Journal of Information Science*, Vol. 36 No. 4, pp. 464-480.

Taylor, L.A. and Littleton-Kearney, M. (2011), "Concept mapping a distinctive educational approach to foster critical thinking" *Nurse Educator*, Vol. 36 No. 2, pp. 84-88.

Tramullas, J., Sanchez-Casabon, A.I. and Garrido-Picazo, P. (2009), "Personal information management using concept mapping software", *Profesional De La Informacion*, Vol. 18 Issue 6, pp. 601-612.

Tungare, M. (2009), "Mental workload in personal information management on multiple devices". VDM Verlag Dr. Müller, Saarbrücken.

Voelkel, M. & Haller, H. (2009), "Conceptual data structures for personal knowledge management", *Online Information Review*, Vol. 33 No. 2, pp. 298-315.

Walton, G. (2008), "Theory, research, and practice in library management 4: creativity", *Library Management*, Vol. 29 No. 1/2, pp. 125-131.

Corresponding author

Ina Fourie can be contacted at: ina.fourie@up.ac.za