

Differences on How People Organize and Think About Personal Information

Matjaž Kljun

Infolab21, School of Computing and Communications,
Lancaster University, Lancaster, LA1 4WA, United Kingdom
m.kljun@lancaster.ac.uk
<http://scc.lancs.ac.uk/>

Abstract. Personal information management (PIM) is a study on how people handle, store, classify, organize, maintain, archive personal information to support their needs and tasks. In the last decade a lot of studies focused on how people acquire, organize, maintain and retrieve information from their information spaces with a focus on offices, electronic documents, email and web bookmarks and the fragmentation of information between these collections. Results have led to many research prototypes that tried to either augment present tools or integrate these collections within entirely new designs. However not much has changed in the present tools and hierarchies still prevail as the storage foundation. Our research aims at understanding the difference between how people organize their information in various applications and physical space and how they actually think of this information in relation to tasks they have to accomplish. We carried out a preliminary study and are currently finishing another study which both show that there is a difference on how information is organized in formal structures on computers and physical spaces and how it is thought of in users heads. These findings have motivated the design of an applications that tries to mimic the later.

Keywords: personal information management, mental

1 Introduction

PIM studies vary from the usage of office space for managing information [10] [14], to computer documents [11][7], email [6] and web bookmarks management [1]. Some studies covered more collections and focused on how fragmented information is managed across different tools [3] and even devices [13]. These studies aimed at understanding management practices and how they change over time, or how related information is managed across applications. Many research prototypes addressed the issues found in mentioned studies with spatial management, piles, different visualizations, context awareness, tagging and agents to improve and ease management practices of users. Some prototypes also addressed the fragmentation problem and introduced tools that enabled users to manage different types of information together. The later prototypes used either existing

applications and embed other information types (like Taskmaster) or work above them as another layer (like WorkspaceMirror), while others introduced new interfaces with mixing several information types (like Haystack). It has been noted that there is a lack of testing all such prototypes [3] which has not changed lately.

There has also been a lot of studies on how users perform tasks like how interruptions are affecting the tasks completion and found out that users have most problems returning to long lasting tasks [5]. Several suggested solution also tried to bring together information that is task related [12][8][2]. Some solutions even bend towards helping users to complete their task with suggesting future possible actions [4].

However none of the mentioned studies and prototypes did not focus on understanding the difference between how people organize their information in personal information collections (PICs) in software applications and tools, and how they manage information in their heads when they have the task to complete (which we are calling Task Information Collections). None of the prototypes The difference between the two, understanding how this gap can be bridged and if it has to be bridged at all is the aim of our study.

2 Research Goals

People need information to complete their tasks and they acquire information by different tools and means. We named all information relating to a task a TIC. Our studies showed that TICs are partly supported by tools (desks, file cabinets, clips), software applications (divided by information types), web space and are partly held in our heads. Although there is a need to integrate information of various types and formats it was still not studied what is the best way and to what extent users want to integrate their information in support of tasks. Our research goals are to understand:

- How users think of their information that relates to the task at hand and how they manage TICs in their heads.
- How TICs change over time with a task passing by and how it is forgotten (if it is) after a related task is finished.
- How and if these changes are related to how information is acquired (created, found, given), its importance, duration of a task, etc.
- How TICs overlap and how information in PICs is reused in various TICs.
- How to preserve some of the TICs for users and for how long or if they need to be preserved at all.

Answering these questions will help us understand the difference and relations between the two collections and their changing over time. The results will be used to build the prototype application to support the management of TICs in relation to information scattered over several applications and WWW.

3 Progress To Date

Theoretical Research and User Studies We reviewed the Personal Information Management frameworks in [9], which also included the findings from our preliminary study. We studied some PIM practices of 7 students that signed up and volunteered to enter data each day for a month in an anonymous questionnaire. The main questions of the study were: (1) which information items participants regarded as important after each day, (2) how much time they spent on creating (editing), finding or reading these items, (3) which of these items participants considered linked to other items and which were these linked items.

We found that (1) more than half of information regarded as important was created, (2) that level of importance dropped quickly for most information items, (3) users linked information in their heads regardless of the application used to manage it and (4) that mental links to information items not regarded as important were also maintained and. The results showed that TICs are formed by information of various types and formats. It also showed that TICs overlap as some information items were linked to other information items that were not related. These results led to our present longitudinal study which aims to understand how people talk about their tasks and information related to these tasks. In semi-structured interviews we ask participants about most important tasks they had to work on in the last two weeks. They give us a tour of information related to a task on their computers and desks and draw how all presented information is related to a task.

First results show that most of the TICs take a form of a mind map and that TICs do overlap. These results are the base for our TICs management research prototype.

Prototype Design and Implementation We are currently implementing the research prototype called *Task Information Map*. It allows users to define tasks and subtasks to which they can drag separated digital documents or folders of documents, URLs and to some extent email from their existing applications. It also allows to rate importance of information items through time. The prototype builds a map based on where information collections (folders) or information items are dragged and finds overlaps between tasks. It allows users to navigate their information through their tasks and vice versa. The development is in its initial phase and as such has not been tested. Although the prototype sketches received encouraging feedback. After completing the prototype we plan to extensively evaluate it participants' working environments.

4 Key Contributions

This research aims to understand how the organization of information in the physical and digital worlds differs from mental organization of information users need to accomplish and complete their tasks. We hope that this contribution will affect future designs of software applications addressing the information fragmentation problem and ease management of personal information.

5 Acknowledgements

I would like to thank my advisor, Dr. Alan Dix, for insightful discussions, advice and support.

References

1. Abrams, D., Baecker, R.: How people use www bookmarks. In: CHI '97: CHI '97 extended abstracts on Human factors in computing systems. pp. 341–342. ACM, New York, NY, USA (1997)
2. Bergman, O., Beyth-Marom, R., Nachmias, R.: The user-subjective approach to personal information management systems design: Evidence and implementations. *J. Am. Soc. Inf. Sci. Technol.* 59(2), 235–246 (2008)
3. Boardman, R., Spence, R., Sasse, M.: Too many hierarchies? The daily struggle for control of the workspace. In: *Proc. HCI International 2003*. Citeseer (2003)
4. Catarci, T., Dix, A., Katifori, A., Lepouras, G., Poggi, A.: Task-Centred Information Management. *Digital Libraries: Research and Development 4877/2007*, 197–206 (November 25 2007)
5. Czerwinski, M., Horvitz, E., Wilhite, S.: A diary study of task switching and interruptions. In: CHI '04: Proceedings of the SIGCHI conference on Human factors in computing systems. pp. 175–182. ACM, New York, NY, USA (2004)
6. Fisher, D., Brush, A.J., Gleave, E., Smith, M.A.: Revisiting Whittaker & Sidner's "email overload" ten years later. In: *CSCW '06: Proceedings of the 2006 20th anniversary conference on Computer supported cooperative work*. pp. 309–312. ACM, New York, NY, USA (2006)
7. Jones, W., Phuwantnarak, A.J., Gill, R., Bruce, H.: Don't take my folders away!: organizing personal information to get things done. In: CHI '05: CHI '05 extended abstracts on Human factors in computing systems. pp. 1505–1508. ACM, New York, NY, USA (2005)
8. Kaptelinin, V.: Umea: translating interaction histories into project contexts. In: CHI '03: Proceedings of the SIGCHI conference on Human factors in computing systems. pp. 353–360. ACM, New York, NY, USA (2003)
9. Kljun, M., Dix, A., Solina, F.: A study of a crosstool information usage on personal computers: how users mentally link information relating to a task but residing in different applications and how importance and type of acquisition affect this. (November 2009), <http://eprints.lancs.ac.uk/33816/>
10. Malone, T.W.: How do people organize their desks?: Implications for the design of office information systems. *ACM Trans. Inf. Syst.* 1(1), 99–112 (1983)
11. Ravasio, P., Schr, S.G., Krueger, H.: In pursuit of desktop evolution: User problems and practices with modern desktop systems. *ACM Trans. Comput.-Hum. Interact.* 11(2), 156–180 (2004)
12. Smith, G., Baudisch, P., Robertson, G., Czerwinski, M., Meyers, B., Robbins, D., Andrews, D.: Groupbar: The taskbar evolved. In: *Proc. OzCHI*. vol. 3. Citeseer (2003)
13. Tungare, M., Pérez-Quinones, M.A.: Mental workload in multi-device personal information management. In: *PIM Workshop 2009*, Vancouver, BC, Canada (November 7-9 2009)
14. Whittaker, S., Hirschberg, J.: The character, value, and management of personal paper archives. *ACM Trans. Comput.-Hum. Interact.* 8(2), 150–170 (2001)