Exploring the Design Space for Personal Information Management Tools

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ABSTRACT

The storing and retrieval of personal and work-related information from large capacity storage devices has become tedious and haphazard especially for individuals that are not technologically or computer literate. There must be a better a way to help people remember where information has been stored, implicate its temporal importance and manage daily tasks. This paper discusses a study currently investigating personal information management and archiving, with an objective of designing software tools to assist the process.

Keywords

Information visualization, personal information management, personal history, task analysis, email, phenomenological study.

INTRODUCTION

As the age of technology continues to accelerate providing us with devices that afford connectivity to virtually any place on the globe, we have become inundated with personal information. Everyone must sort, filter, read, answer, store and discard information in their daily lives. With the advent of the Internet and distributed communication applications such as email, the amount of information, in addition to paper documents, has increased exponentially.

Often people build piles in their environment to help sort and organize their personal information. Any place and every place may become suitable to store a small fraction of this information in hopes that some cognitive cue will remind the individual of what is in this discrete cluster of information. Usually, information is placed in the cluster and often forgotten until some event occurs that forces its retrieval under somewhat hurried or perhaps desperate circumstances. Typically, no one other than the individual who placed the information in the cluster or grouping can have any hope of a timely recovery. Often, other people are dependent or have contributed to this information cluster and serendipitous recovery is a process that is unnerving and discomforting.

THE PROBLEM

The information technology revolution has been proceeding at a furious pace to ever-higher levels of complexity in an effort to help us record our personal information. Vast distributed networks are pervading our personal information space adding a level complexity that no one had anticipated or prepared for. No longer is an individual's personal information only maintained in a single site (e.g., home or office) or on a centralized computer. Web-based access to information has complicated the situation through the use of applications that have complex or dissimilar user interfaces. This fragmentation of personal information across numerous storage devices begins to blur the memory of users and impede timely retrieval. This can have a significant impact on the success or failure of an individual when information cannot be retrieved and acted upon in a timely manner.

This last point has special significance. To maximize success, individuals organize their information in a manner that is most helpful in cueing the remembrance of valuable data. Several organizational structures have been implemented and studied. As previously stated, the "pile metaphor" study was an effort at duplicating the organizational style of individuals that literally pile information into groups having poorly defined boundaries yet can visually stimulate mental processes increasing the perception of the pile contents [1]. By identifying the data with a single categorical identifier, less time is required to browse the structure and find the data item.

However, this information is vital to the decision-making process of an individual and its loss may result in actions taken that are detrimental to the individual trying to cope with an information overload situation. To ameliorate the problem, users have now redefined the uses of such innovative computer applications such as email that is now being used as a remembrance agent and as a task management tool [2]. Email users often find themselves with large hierarchical structures comprised of inboxes full of email that is neither remembered nor retrieved. Browsing

for information in these large structures is tedious and time-consuming.

Email is not the only web-based application that suffers from this information overload. The World Wide Web now consists of many millions of web sites that allow user to research, locate, compare, purchase, record information about every aspect of their lives. More and more governmental processes are being made available through the web in an attempt to reduce processing delays and minimize paper records. In order for the user to recall where they have been on the web they must rely on saving addresses in bookmark and favorite folders or resort to writing a record of the task on paper. However, this process still suffers from the problem of building a data structure that the user can place the data in and most importantly, remember where the information was stored.

Note that in most every case, the most efficient way to perform this archiving process is to group items of similar type together and order them by time. This is not how most individuals encounter information. Several different pieces of information may be related but are dissimilar in type. For instance, in filing a yearly tax return, an individual might use one of several computer applications linking stored finance records with personal information kept on paper media such as a health expenditures or stock liquidation receipts. Some method of reconciliation between the two disparate pieces of information is needed to remind the individual where those information items are kept.

PERSONAL INFORMATION MANAGEMENT

Anyone can sit down and construct an application that will perform some functionality that might help organize personal information. However, this type of reaction to a perceived problem often falls short in delivering a richly structured domain-centered tool. Essential to tool development is the understanding of user needs. This requires performing a careful task analysis that decomposes the information management process and reveals the underlying goal-oriented user activities. To explore and learn more about how people store and retrieve all types of information, I am conducting in-depth, phenomenological interviews using purposeful sampling [3]. From the interviews I hope to gain insight into the following information management concepts:

- Types of personal information stored and retrieved frequently

- Information storage locations

- Information clean-up and discard

- Underlying data structures built by the user

- Shared information storage spaces

- The use of email as an adjunct to to-do lists

- Cues that help users remember where data is stored

- Pathways of connectivity

- The affordances in the information space that make an individual feel effective in managing their information

I have chosen to conduct the interviews at the locations where the individuals are immersed in their personal information space. The interviews are recorded using an audiotape recorder and through the judicious (sometimes copious) process of writing notes.

The research challenges for this study are to establish trends and patterns that indicate people use similar processes to construct and manage their information space. The establishment of behavioral patterns will help identify the design requirements for the application to be developed. Based upon the observation gleaned from preliminary interview data, three personas have begun to take form. Those personas are:

- Technology resistant – a person who uses technology only when absolutely necessary and has poor organizational skills

- Technology competent - a person that uses technology on a daily basis and exhibits good organizational skills

- Technology rabid – a person who delights in using technology to complete their daily information processing tasks but exhibits poor organization skills

Although the results from early interview transcriptions are preliminary, patterns and behaviors have begun to appear common to the three personas identified to date. For example, electronic mail appears to be of vital importance to all three personas both as a pathway of connectivity and as a information management tool.

CONCLUSION AND FUTURE WORK

This study is being conducted to provide guidance toward the development of software that will automate the cueing process people construct to support remembering personal information space organization. Efforts to articulate the software design requirements for the toolset are underway.

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