Planning Personal Projects and Organizing Personal Information

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In a given week, an active person may be working on, or at least thinking about, several different projects. Some are work-related ("prepare annual report"); others are not ("plan family ski vacation"). Projects have duration (several days to several months) and a structure that includes basic tasks ("book plane tickets") and subprojects ("decide on hotel"). This article describes exploratory research that looks at the kinds of projects people manage in their daily lives, the problems they encounter and the kinds of support people need to manage better. The personal project is advanced as a tractable unit of analysis for the study of personal information management (PIM). Over time, a personal project often involves several forms of information (paper and digital documents, email, web pages, handwritten notes, etc.) and several supporting applications. People face problems of information fragmentation that are more widely experienced in their practice of PIM. A *Project Planner* prototype explores an exciting possibility that an effective, integrative organization of project-related information can emerge as a natural by-product of efforts to plan and structure the project.

Introduction

As people collect information, they structure it - in various ways and to varying degrees. People create physical piles and analogous groupings of items on a computer desktop. People order their information. People may assign property and value combinations, annotations, and file and folder names including leading characters to influence ordering. People create folder hierarchies. This article describes research examining the structure that people impose, or would like to impose, on information relating to a personal project. Personal projects are "personal" because a person is doing them, not because they are private or involve only the person though certainly projects of this kind are included. Projects may last for days or months and contain tasks and subprojects.

How do people manage a personal project?

Not much is formally known about how people manage a project in their lives; referred to in this article as personal project management or PPM. Mumford, Shultz & Van Doorn (Mumford, Schultz, & Van Doorn, 2001) note that, more generally, the study of planning in psychology has proceeded in "fits and starts" over the past 50 years and remains under-developed. A number of studies of human-computer interaction in recent years look at task management (e.g., (Bellotti et al., 2004; Bellotti, Ducheneaut, Howard, & Smith, 2003; Czerwinski, Horvitz, & Wilhite, 2004; Gwizdka, 2002a; Kaptelinin, 2003; Kim & Allen, 2002; Mackay, 1988; Wolverton, 1999; Yiu, 1997)). However, the task as an object of these studies has relatively short duration (a few minutes to a few hours) and with relatively little structure or associated planning.

The phrase "project management", is commonly associated with large projects involving teams of people using complicated, structured and restrictive software applications such as Microsoft Project®. But these large projects are far removed from the projects people manage in their daily lives.

Most people do not use special-purpose software. Instead they carry around goals, constraints, planning, structure, dependencies, deadlines, etc. for a project in their own heads making occasional and ad hoc use of external aids to structure their thoughts and to organize project-related information. People may, for example, use paper notepads, whiteboards, the outlining facility of a word processor, or the list making facility of a spreadsheet application.

This article describes two studies looking at how people organize information relating to their personal projects. The article also provides an update on a parallel prototyping effort

that is guided by and, in turns, guides fieldwork studies such as those described in this article. Prototyping explores the possibility that better support for the planning of a personal project can yield richer external representations (ERs) (Russell, Stefik, Pirolli, & Card, 1993) that serve several purposes through a single effort: *The ER that people develop to understand and plan their project can also help to organize project-related information*.

Personal tasks and personal projects

An informal distinction is made between a *personal task* and a *personal project* or, simply, *task* and *project*. For *task*, we use a simple, intuitive definition implicit in Bellotti's use of the term (Bellotti et al., 2004): A task is something we might put on a "to-do" list. "Check email", "send mom flowers for Mother's Day", "make plane reservations" are each examples of tasks. With respect to everyday planning, tasks are atomic.

A project is made up of any number of tasks and sub-projects. While it makes sense to put tasks like "Call our financial planner" on a to-do list, it makes little sense to place a containing project like "Plan for our child's college education" into the same list (except perhaps as an exhortation to "get moving!").

Task management as used, especially recently, in studies of human-computer interaction (e.g., (Bellotti et al., 2004; Bellotti et al., 2003; Czerwinski et al., 2004; Gwizdka, 2002a, , 2002b; Kaptelinin, 2003; Kim & Allen, 2002; Mackay, 1988; Silverman, 1997; Whittaker & Sidner, 1996; Williamson & Bronte-Stewart, 1996; Wolverton, 1999; Yiu, 1997) refers primarily to the management *between* tasks including handling interruptions, switching tasks and resuming an interrupted task. Project management as used in this article refers primarily to the management of various components *within* a project. The extended lifetime of a project and the structures that are imposed upon it are perhaps an inevitable consequence of its many components and their interdependencies - to each other and to outside agents. For the project to be successfully completed, many or most of these components must also be completed, in the right order, at the right time. To take the example of planning a wedding (Jones, Phuwanartnurak, Gill, & Bruce, 2005), it is important to set a wedding date but not before dates of availability for the preferred location of the wedding are confirmed. If the wedding cake, wedding dress, vows, bouquet, etc. are all selected on time, the wedding is still not likely to be considered a success if the invitations don't go out in time.

A better understanding of how people go about managing important projects and the information required to complete these projects could have several near-term practical

benefits. Better computer-based support can be expected to follow. Studies may also elicit better, teachable techniques and strategies of PPM. The study of PPM may produce a set of "do's and don'ts" that people would otherwise have to acquire by hard-won experience.

The study of PPM should also prove useful to the study of personal information management or PIM. One ideal of PIM is that we have the right information at the right time, in the right place, in the right form, etc. (Jones & Maier, 2003). This ideal is far from the reality for most people. A wide diversity of PIM-related tools has become part of the problem – leading to information fragmentation. A person may maintain several separate, roughly comparable but inevitably inconsistent, organizational schemes for electronic documents, paper documents, email messages and web references. The number of organizational schemes may increase if a person has different email accounts, uses separate computers for home and work, uses a PDA or a smart phone or uses any of a bewildering number of special-purpose PIM tools.

Moreover, the study of PIM itself is often fragmented by application in ways that parallel the fragmentation of personal information. Many excellent studies focus on uses of and possible improvements to email (for example, (Bellotti et al., 2003; Bellotti & Smith, 2000; Ducheneaut & Bellotti, 2001; Gwizdka, 2000, 2002a, 2002b; Mackay, 1988; Whittaker & Sidner, 1996; Wilson, 2002). Other studies similarly focus on the use of the Web or specific web facilities such as the use of bookmarks or history information (Abrams, Baecker, & Chignell, 1998; Byrne, John, Wehrle, & Crow, 1999; Catledge & Pitkow, 1995; Tauscher & Greenberg, 1997a, , 1997b). A wide range of studies have looked at the organization and retrieval of documents in paper and electronic form (for example, (Carroll, 1982; Case, 1986; Malone, 1983; Whittaker & Hirschberg, 2001).

The study of PIM puts an emphasis on helping people manage their information over time and in ways that cross the many boundaries set by current tools. This is a worthy if somewhat daunting ambition. How much personal information do we study? For how long? In what contexts? A personal project may serve as a tractable unit of analysis for the study of PIM. Most personal projects are bounded in scope and time and they provide an excellent context in which to analyze information management activities. A full range of tools, computer-based and otherwise, are often involved in a project's completion. The study of PPM, therefore, provides a practical way to approach PIM without "falling into" existing tool-based partitions (e.g. by studying only email use or only Web use).

Study One

A simple study was designed to get a better sense for the kinds of projects people are

working on at a given point in time, the forms of information used and the approaches that people employ in the planning of these projects. A deliberate attempt was made to sample beyond the academic environment. "Friends of friends" were opportunistically sampled and, as an incentive, $30 was donated in the name of each volunteer participant in an American Red Cross relief fund for victims of the Katrina hurricane.

Twelve people participated in the study (9 men, 3 women, from 35 to 63 in age). Occupations varied: two software designers, three small business owners (one retired), two stay-at-home parents (both doing lots of volunteer work), two software product managers, one retired engineer, one software sales manager, and one real estate agent.

The study required no more than 20 to 25 minutes of a participant's time distributed between a participant's initial efforts (10 to 15 minutes) to complete a short questionnaire sent in email and a follow-on phone interview (taking an additional 10 to 15 minutes) to complete the questionnaire and to explore follow-on questions.

The questionnaire began by informally defining and giving examples of a project. Participants then were asked to list projects they were actively working on. Participants listed an average of 5.27 projects (stdev = 1.01, mode and median both = 5). For a given participant, just under half were work-related (or related to a primary volunteer activity for participants who were not working). Table 1 provides a sampling of projects listed. Projects lasted or were expected to last an average of 34 weeks but there was great variability in duration from 2 weeks to 2 years or longer.

Table 1. A sampling of projects listed by participants
(in their words with "" for confidential information).

Organize annual Thanksgiving Dinner for Church	Plan December Ski Trip
<blank> remodel	New deck
Plan on-line training course for <blank>	Plan January ski trip
Plan Italy vacation	Run Girl Scout Troop
Camping trip	<blank> Metrics System
Write Comprehensive Strategic Planning document	Sculpting
Investment property <blank>	Music FS
Set up 529 for kids	School Phone book
<blank> reports	Update tools documentation
Plan trip to Illinois to visit relatives	Tools release schedule
Taxes	Build bike rack for garage

Plan Winter vacation	FY2006 <blank> model

Participants then picked a project that, by their reckoning, required the most amount of information. For this project, participants were asked to estimate the percentage of information in different forms as listed in Table 2. Without attributing too much precision to these rough estimates, the majority of project-related information appears to be in the form of files (e-documents) and email. However, information for most projects comes in several forms, including paper. Consistent with other studies (Bergman, Beyth-Marom, & Nachmias, 2006; Boardman & Sasse, 2004; Jones, Dumais, & Bruce, 2002; Ravasio, Schär, & Krueger, 2004), participants all reported that they experienced problems with information fragmentation across their projects and that maintaining (and maintaining consistency between) different organizations was a major problem.

For the selected project, participants were also asked to select the form of information they considered most organized (bolded in green cells in Table 2) and the form they considered least organized (italicized in pink cells in Table 2). Email was overall the least organized. This is in contrast to results from a survey (Bruce, Jones, & Dumais, 2004) indicating that for many people paper documents are now the least organized form of information. Three participants indicated that their strategy was to leave all incoming email in the inbox and use search and sort utilities to organize and locate needed information.

The project to produce a strategic planning document involved heavy use of an intranet site, thus explaining the choice of web pages as most organized. Paper was most organized for three projects. In each, the information involved was organized in a loose-leaf notebook (provided to the participant as the client or organized by the participant acting as a real estate broker). For seven of 12 participants, their files (including e-documents) were listed as most organized for the selected project. This is consistent with previous research suggesting that the organization of files is typically the most elaborated (Boardman & Sasse, 2004).

Table 2. For a selected project, relevant information comes in several forms with varying degrees of organization
("most organized" green cells with bold font; "least ..." italicized in pink cells)

	paper	files[2]	email	web pages	other[3]
<Sport> Solutions	20%	20%	30%	0%	30%
Investment property	30%	30%	10%	20%	10%
Life insurance tool	20%	15%	50%	0%	0%

Refinance our house	20%	0%	50%	30%	0%
Strategic planning doc.	10%	50%	20%	20%	0%
Obs. Metrics	0%	55%	40%	0%	5%
Masters proj.	25%	50%	5%	5%	15%
Real estate client	50%	0%	30%	0%	20%
School phone list	10%	85%	5%	0%	0%
Serv., home schooling	0%	20%	10%	50%	20%
Software release	0%	65%	20%	15%	0%
Newsletter	20%	50%	25%	5%	0%

A final question in this study explored participant approaches to planning the projects that they listed. Percentages (derived from absolute numbers given by participants) are listed in Table 3. Participants on average indicated that they continued to use paper (e.g., a notebook) to write down to-do lists, reminders, notes, etc. for three quarters of the projects they were working on.

Not surprisingly, people reported that they tried to find a related project to use as a template on a large percentage (41%) of the projects they were working on. Sometimes the connection to a related project was direct - as, for example, when a newsletter or a phone list for the current year was based upon the equivalent for a previous year. In other cases, the connection was less direct. One participant, for example, indicated that he and his wife used notes and folder structure from a completed project to landscape their yard as a guide when working on a current project to re-model their house. Participants indicated that, for a high percentage of their projects (42%) they constructed a project outline or a to-do list using their word processor.

Table 3. Approaches in planning used for ongoing projects.

For how many of the projects you listed, did you/do you....	Ave.	stddev
...write notes and to-do lists on in a paper notebook or on a piece of paper.	75%	0.40
...write a plan on a whiteboard.	11%	0.18
...do a "MindMap".	7%	0.20
...write an outline document or to-do using a word processor?	42%	0.26
...try to find a related project to use as a template?	42%	0.34
... actually try to copy the folder structure from this related project?	11%	0.33
... use a dedicated application like MS Project?	7%	0.14

Results of the study suggest the following:

- People at any given point in time are likely to be working on several (five or more) different projects, roughly half of which are work-related. Projects can last from a few weeks to a year or longer.
- The information needed for a project comes in several different forms including paper documents, e-documents, email and web pages.
- People continue to use ordinary paper notebooks to jot down notes, reminders and to-do lists. Two participants reported that they had tried for a period of time (a year or so) to use a PDA (Personal Digital Assistant) instead of a notebook. Both participants had abandoned their PDAs as "too complicated", "too much trouble" or "one device too many" (both now used full-featured cell phones and the also used laptop computers).
- For nearly half (42%) of the projects reported by participants in the study, some form of a digital planning document (e.g., an outline or to-do list) was used.

Study Two

Study Two was designed to gain a deeper understanding for how people organize the various forms of information that relate to a given project. Special attention was given to the role of folders and naming conventions in the structuring of project-related information.

Fourteen participants (six women, eight men, ages from 25 to 62) each completed a session of 60 to 90 minutes in length. Ten participants were employed by the University of Washington (four professors, two librarians, two support staff and two graduate students). Also participating were an electrical engineer, two software engineers, and one high-level manager, all male, none affiliated with the University of Washington.

All but one interview took place at the person's place of work; the remaining interview took place in the person's home office. Pictures were taken, using a digital camera, of various collections of information pertaining to a selected project.

The interview began with questions similar to those used in Study One. Participants were asked to list projects in their own lives that they would be comfortable discussing with the interviewer and to select one of these for the interview. Across participants an attempt was made to equally represent work and non-work related projects.

For the selected project, the participant then gave the interviewer a "guided tour" showing

how project-related paper documents, electronic documents, email messages, web references and any other project-relevant information types were organized.

One result of this study has been reported (Jones, Phuwanartnurak et al., 2005) as a late-breaking result at CHI'2005. People were given a thought question at the end of the first session: "Suppose that you could find your personal information using a simple search rather than your current folders…Can we take away your folders? Why or why not?" Participants were permitted to stipulate additional features of this hypothetical search utility and the "folder-free" situation. Issues of control and storage would be handled in some other way. The search utility itself would be fast, effortless to maintain, secure and private (no personal information would be communicated to the Web), etc. With these conditions in place, 13 of 14 participants gave a resounding "No!" to the question "Can we take your folders away?"

Participants would not give up their folders for a range of reasons including:

- "I want to be sure all the files I need are in one place".
- "Folders help me see the relationship between things".
- "Folders remind me what needs to be done".
- "Folders help me to see what I have and don't have".
- "I use empty folders for information I still need to get."
- "Putting things into folders helps me to understand the information better".

These reasons can be understood with reference to the representation of a folder structure for a house re-model in Figure 1. The comments of participants make it clear that file folder hierarchies such as that of Figure 1 are more than a means to one end - the organization of files within for later access. The hierarchy can be seen as an external representation, albeit partial and imperfect, for the participant's project to re-model her house.
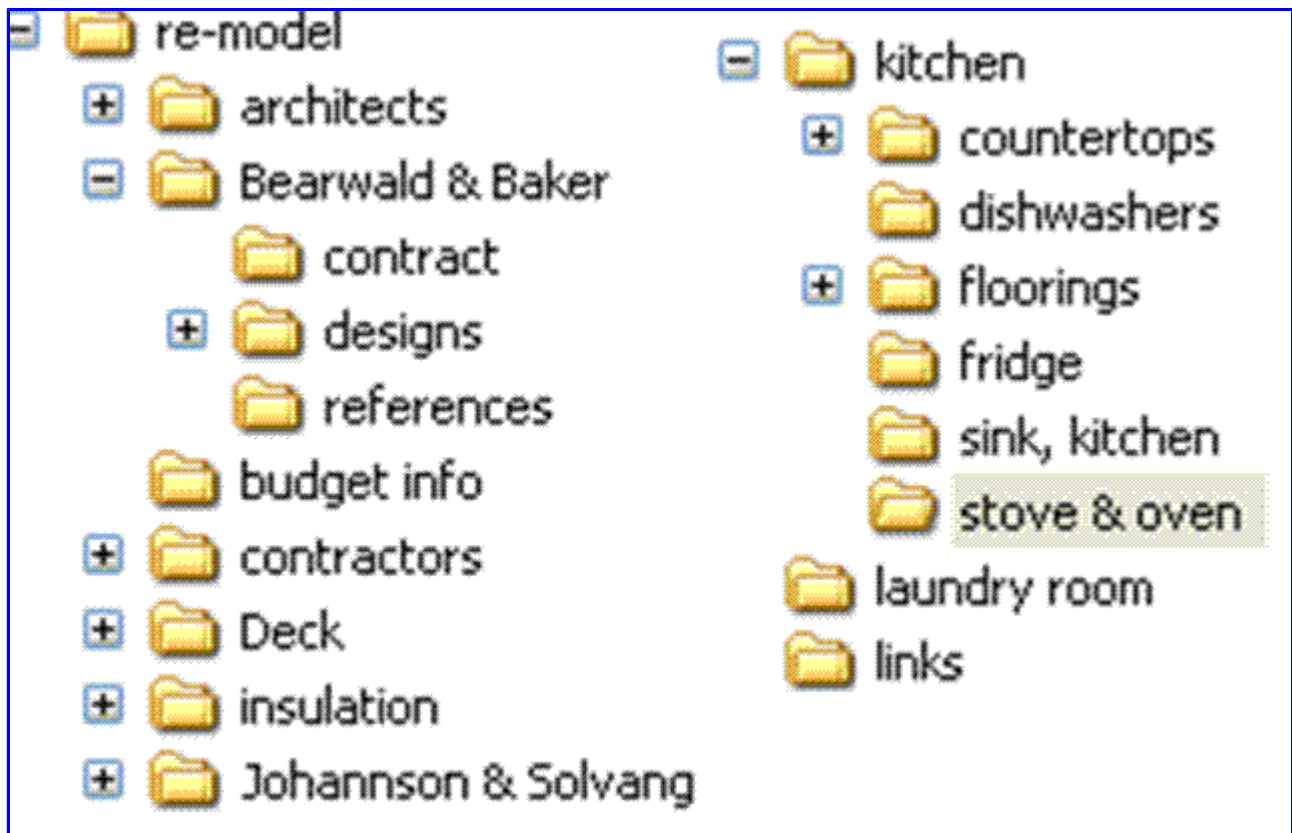
Figure 1. A file folder hierarchy for a home re-model.

The participant's file manager was never designed to support the use of a folder hierarchy as the external representation for a project and its planning. Here are but a few of the many features that not well supported now but that might be useful:

- *A manual ordering of folders*. Many participants forced an ordering of folders through the selection of leading characters in folder names (e.g., "1", "2", "_", "zz"). See, for example, Figure 2. Participants could order files and folders in certain views of their file managers but not others.

- *The ability to use and re-use structures*. Many of life's activities share similar structures. One business trip is much like another, for example, with a need to complete many of the same kinds of tasks (make plane reservations, make hotel reservations, …). One participant in the study created special dummy folder hierarchy called "course xx_xxx" containing a structure of empty subfolders for "reading", "assignments", "grading criteria", etc. (See Figure 3). There is little system support current for the location and re-use of structure.

- *Support for "garbage collection"*. All participants made remarks such as "I really need to get rid of this" or "This is in the wrong place" (see Table 4). Boardman and Sasse (Boardman & Sasse, 2004) report a similar finding. Several people felt compelled to interrupt the interview in order to move or delete information.

- *Other project- and task-related features*. All participants kept project folders. A

project folder was defined (1). to have a name that, by participant agreement, signified a project they wished to complete and (2). to contain subfolders, the majority of which represented, also by participant agreement, either sub-projects or tasks (e.g., "(select) architect". In the context of a project, the ability to take informal notes or to set reminders and due dates might be especially useful.
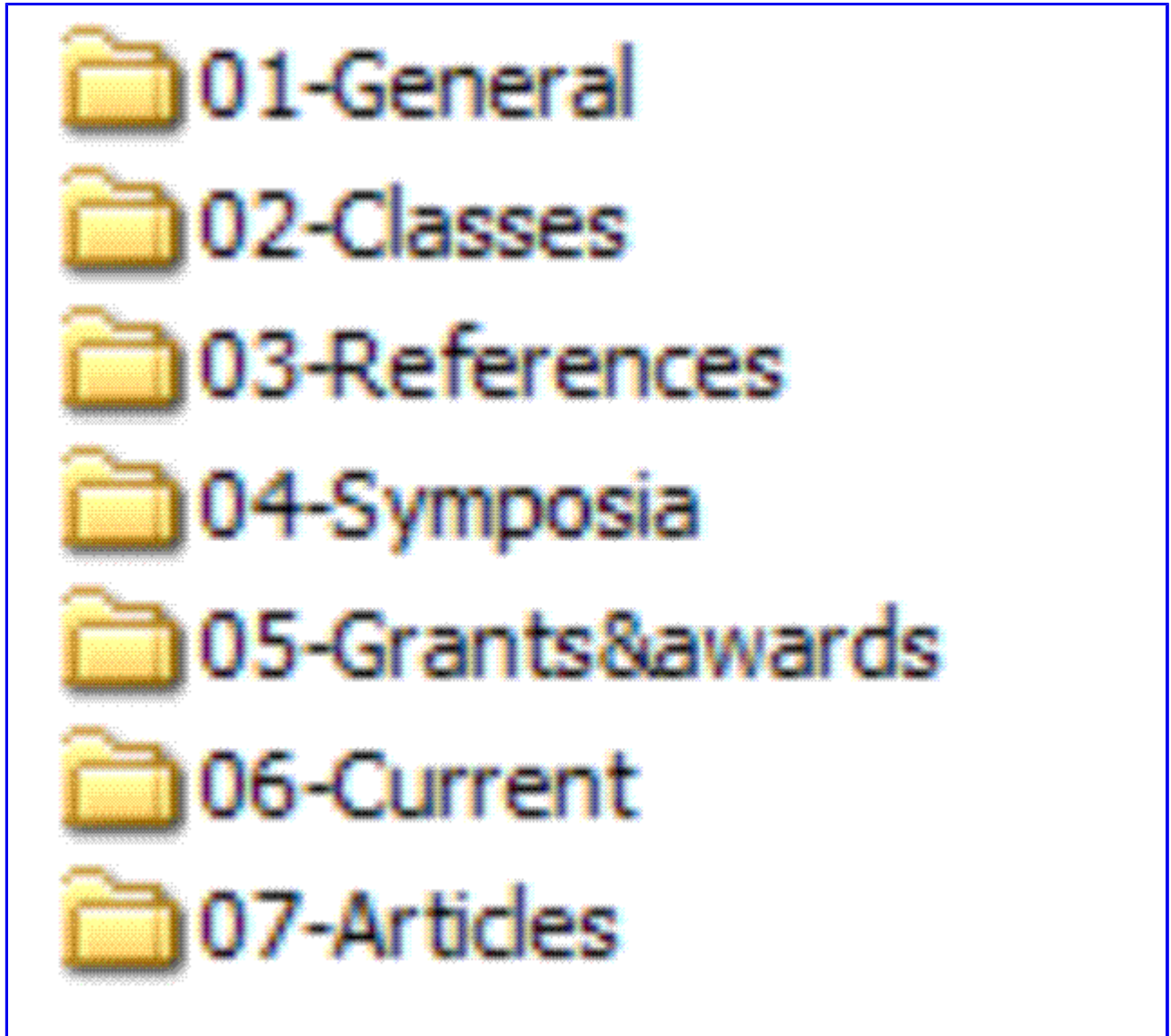

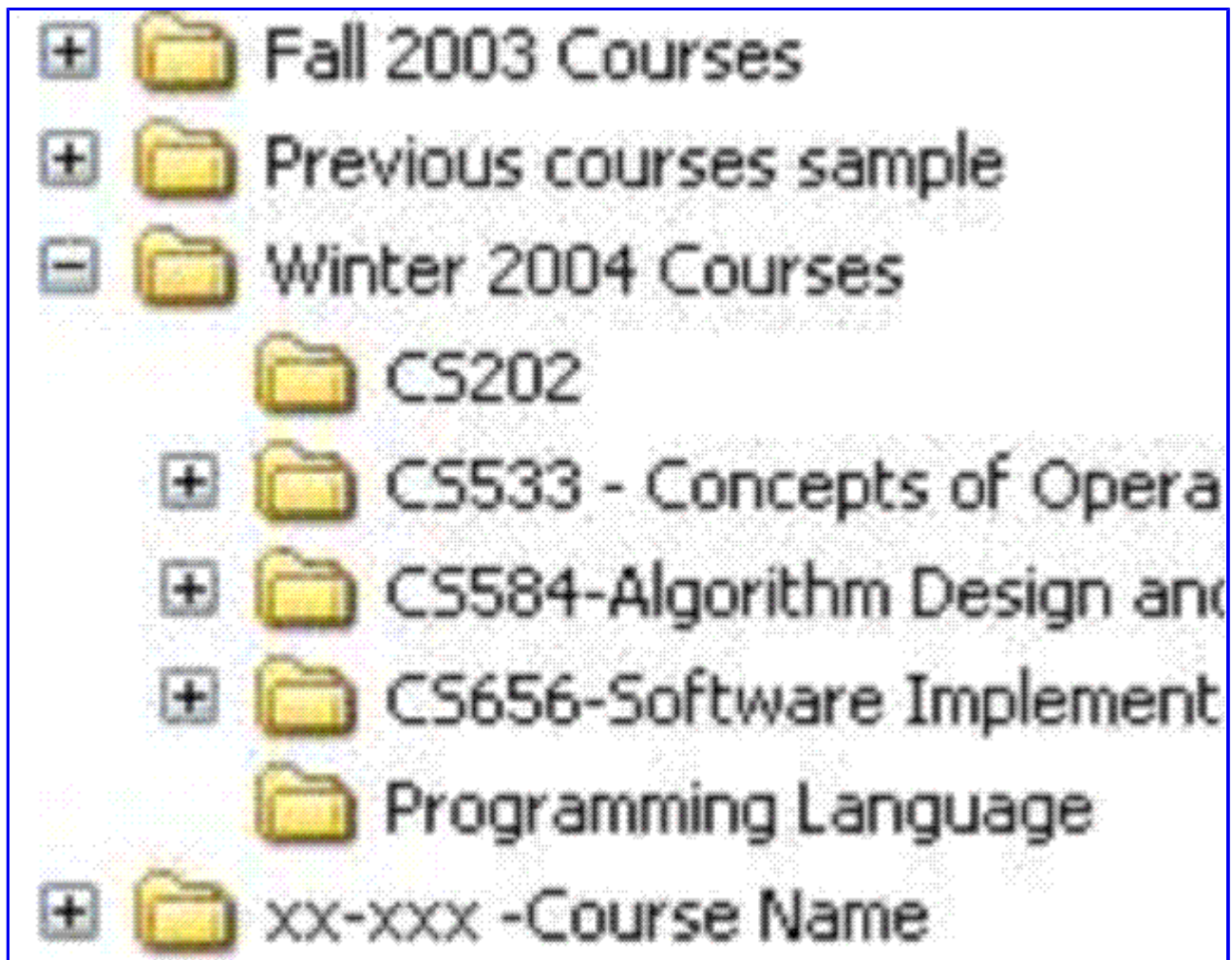Figure 2. The use of leading characters to force an ordering of folders.

Figure 3. "xx-xxx-Course name" to re-use structure.

Data from Study Two are summarized in Table 4.

Table 4. A summary of fieldwork data from Study Two.

Observation	n	%
Leading characters to re-order	8	57%
Efforts to re-use folder structure	5	36%
"I really need to move/delete"	14	100%
"Wait while I move/delete"	3	21%
Project folders (e.g., "re-model")	14	100%

This study reaffirmed previous observations (Bergman, Beyth-Marom, & Nachmias, 2003; Boardman & Sasse, 2004; Jones et al., 2002; Ravasio et al., 2004) that people develop their own unique approaches to information management. There is large variation in the way people approach information management and sometimes even in the way a single

individual manages information for different projects. Two brief case descriptions help to convey this diversity.

Don is a vice president in charge of business development and general legal counsel for an investment firm. Near the beginning of the interview Don said, *"In law school, a professor once told us that practicing law is 90% organizational skills, 10% law. But of course, there's the ideal and then the reality-there's ALWAYS room for improvement."* Don uses an Apple PowerBook G4. Don chose to discuss his project to advise a major Web search service provider. Don maintained a single file folder for this project that contained five subfolders (but no sub-subfolders). Each subfolder represented a distinct aspect of business development for his client (e.g., "advertising"). Don keeps all email relating to the client project in his inbox but he carefully selects a structured subject line for each email he sends out. This subject line includes client name, topic and subtopic. He follows a similar naming scheme for files associated with the project. Don also maintained a small hanging folder of paper documents associated with the project. Web references were not organized by project. Don said that he was able to find project-related email and documents (paper and electronic) easily when needed. However, he mentioned that the careful coding of information into a subject line was sometimes cumbersome and did not work well for client-initiated email messages (that did not follow this coding scheme).

Melissa is a stay-at-home mom who does lots of volunteer work. Melissa does her computing on a desktop machine running Microsoft Windows XP. Melissa chose to discuss her volunteer work to put together a small phone book for students, parents and teachers of the elementary school attended by one of her two children. To maintain some control over access, the phone list is distributed in paper form only. Many of the updates to this phone list also come to Melissa as paper forms filled out by parents at the beginning of the year to provide updates (concerning phone number, address and martial status of the parents).

Melissa manages several additional sources of information including a summary report from a Web site that parents are encouraged to use to provide updates and also including a report generated from the school district's database. Melissa also uses data and documents from the previous year as a starting point. Much of the data resides in various Microsoft Excel spreadsheets on Melissa's desktop computer. Over the years a certain process and steps have emerged in the production of the phone list and this is partially reflected in the names that are assigned to spreadsheets (e.g., "Phone Book 2002-2003 Missing Information", "Phone Book 2003-2004 Removed"). All files across the years reside in a single " Phone Book" folder with no further organization into subfolders. By contrast, emails associated with the phone book project are organized by subfolders corresponding to academic year. A similar organization is imposed on paper documents

relating to the project. Melissa maintains no project-specific organization of web information. Melissa was in the process of handing off her work to another volunteer for the next academic year and was trying to create a "how to" document to explain her steps. Melissa explained that this was challenging to do because her system was only partly reflected in the external organization and mostly resided "in my head".

Prototyping

Results from fieldwork studies are guiding an ongoing Universal Labeler (UL) prototyping effort (Jones, Munat, & Bruce, 2005). The UL follows an "un-application" approach with emphasis placed on incremental add-ons and overlays to existing tools and applications in preference to the creation of separate applications (and new forms of information to be organized). The approach is motivated by insights derived from our studies on the Keeping Found Things Found (KFTF) project (kftf.ischool.washington.edu/) and from the research of others:

- Project-related information is currently scattered across several different organizations - for paper documents, e-documents (and other files), email and web references.
- People have invested considerable effort in existing organizations of information. People are reluctant to adopt new applications especially if these require the maintenance of new organizations or an abandonment of work invested in current organizations.
- For most people, the file folder organization is the most elaborated of their organizations.
- People structure their understanding of a project through outlines, to-do lists and other external representations written on paper or in an electronic document.
- These external representations can also form the basis for an integrative organization of files, email, web information and notes.

The UL includes a set of modules which work as add-ons to and extensions of existing applications such as the user's file manager, email client, web browser and word processor. A guiding principle of the UL is that *information management and task/project management are two sides to the same coin*. Moreover, given the right support, an integrative organization of information can emerge as an outgrowth of efforts to plan a project and mange its tasks.

In the UL's Project Planner module, for example, users can begin their work on a project such as "house-remodel" top-down by building an outline where major headings like

"kitchen" or "media room" represent high-level project components. Or users can start bottom-up by typing in notes and gathering bits and pieces of information from web pages, email messages and e-documents through a drag-and-link operation. With drag-and-link, information is hyperlinked back to the source so users can drag only a small, key part of a larger document (email message, web page) with the assurance that more information is only a click away.

Over time, a basic plan emerges such as that depicted in Figure 4. The plan is essentially another view into a part of the user's file folder hierarchy where headings are folders, subheadings are subfolders and hyperlinks are shortcuts. Users can easily switch to a more conventional file folder view if they want. However, users may prefer to stay in the Planner view for the rich-text, document-like features it provides. In addition to drag-and-link and the ability to type formatted notes, users can also order headings and subheadings in ways that help them to make sense of a plan or to see first things first - just as they might like to do in a word processor.

House Re-model -- Planner View

File   Edit   Help

Level 0

- kitchen
  - *counter tops*
    - new-tech alternatives
      - granite is expensive .. check out other c
    - find out what the budget allows
      - quick questoin about budget for cou
    - lower cost granite
      - some good web sites...
      - Granite has recently become the m kitchens. Granite is both durable an
      - Unlike marble, granite is a relatively unaffected by most chemicals
  - *overall layout*
    - decide whether galley ktichen or big social area
  - *cabinets*
    - decide on a wood and whether to do custom
  - *flooring*
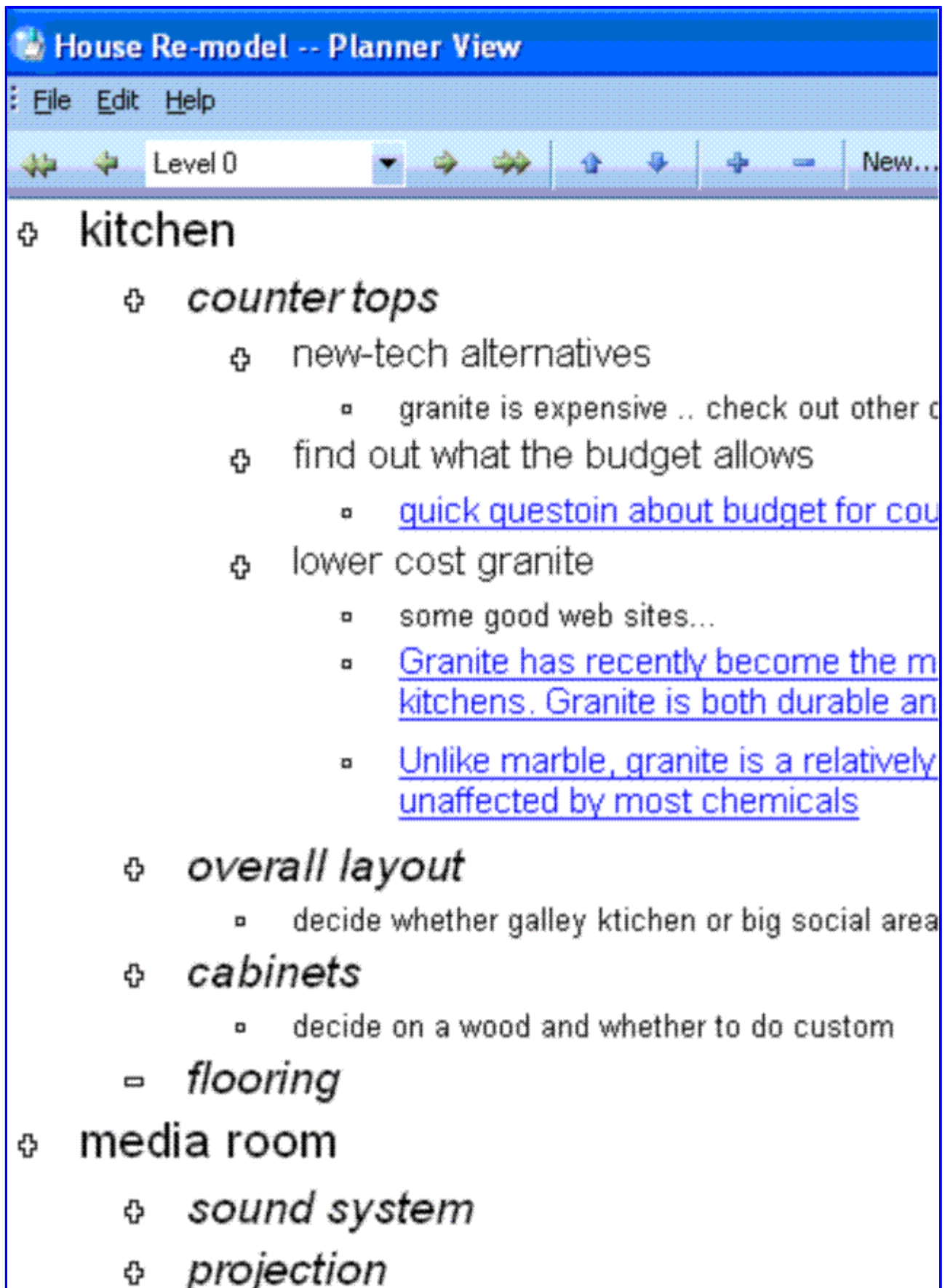- media room
  - *sound system*
  - *projection*

Figure 4. A plan built in the Project Planner also organizes project-relevant information.

The Planner is also designed to support a situated creation of new information items via a *create-and-link* operation. As illustrated Figure 4, for example, the task "find out what the budget allows" prompts an email inquiry to the contractor ("quick question about the budget..."). Although the email message itself remains in storage managed by the email application (Microsoft Outlook), a reference to this message is placed at the insertion point, immediately under the task. The project plan then provides a context in which the email message can be located again later (as alternative to trolling through sent mail) in order to answer questions like "Did the contractor ever respond? What did he say?" Similarly, a new document or a new web search can be initiated from and linked to the context of a project plan.

Planner Architecture

Behind the scenes, the Planner is able to support its more document-like outline view by distributing XML fragments one per file folder. A sample portion of a fragment is displayed in Figure 5.

```xml
<?xml version="1.0" encoding="utf-8"?>
<Label>
  <ChildLabel GUID="d64..." Name="A" Order="0" />
  <ChildLabel GUID="1ff..." Name="B" Order="1" />
  <Link GUID="5da..." Name="My Work" Order="2" Li
  <Note GUID="103..." Name="Here is the text for
  <Word GUID="ad7..." Name="Word Doc" Order="4" L
  <ChildLabel GUID="e82..." Name="D" Order="3" />
  <ChildLabel GUID="1c0..." Name="E" Order="5" />
</Label>
```

Figure 5. A sample XML hidden file used to support a rich-text overlay to the file system.

For any given folder, the Planner assembles fragments on demand to present a coherent project plan view including notes, excerpts, links and an ordering of subfolders (and sub-subfolders).

The distribution of XML fragments in association with file folders has more general application as a way to support a variety of views into a collection of personal information. Other potentially useful views include work flow views, decision tree views and tabular views. Views can readily be enhanced through the use of pictures and graphics.

Next steps

Other views into the same structure. The distribution of XML fragments in association with file folders has more general application as a way to support a variety of views into a collection of personal information. Views can be enhanced through the use of pictures and graphics. No matter how many extra views are supported, there is a single structure of folders and shortcuts underneath. We are beginning to explore the utility of other potentially useful views including workflow views, decision tree views and tabular views.

Re-usable structures. We have just completed a first version of a simple **Paste Structure** feature in support of users such as the participant in study two who created the folder

template shown in Figure 3. Using Paste Structure, the user can copy the folder structure for one project (e.g. for a "trip to Denver") to use as a template for a new project (e.g., "trip to Boston"). The folder hierarchy is copied but files within are not.

Life Organizers. We are also exploring the potential of downloadable Organizers" for various activities such as "Buy a house" or "Get a (better) job". Organizers are a modifiable "canned plan" that people can use as a starting point. Labels/headings of an organizer can help people to approach a project and to remind them of important aspects to the project. Links in an organizer can point to useful reference information.

Conclusions

To be active as a person is to have projects. Some projects are professional or work-related; others are personal, family or civic-related ("Re-model the house", "Plan a family vacation", "Organize a fund drive"). Projects have a lifetime from several days to several years. Projects also have a structure and a plan. The structure for some projects is flat - little more than a "to-do" list. The structure for other projects can be quite elaborate. A project may have subprojects which in turn have sub-subprojects.

A better understanding of how people plan and manage their personal projects - personal project management or PPM - is important in its own right. Moreover, personal projects may represent a tractable unit of analysis for the larger study of personal information management (PIM). Personal projects extend over a period of weeks or months and involve many different forms of information. People encounter many of the problems of PIM as they try to complete a project - especially problems relating to information fragmentation.

Studies described in this article indicate that people already create planning documents - sometimes simple to-do lists, sometimes more elaborate outlines - when working on a personal project. The Universal Labeler (UL) and the Project Planner module in particular are designed to leverage this work. Efforts like the UL may take us one step further in integration - towards a situation in which personal information is naturally organized and managed as an outgrowth of a person's efforts to plan a project.

Acknowledgements

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