Just for me: Personal Applications of Life Tracking and Activity Capture

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Abstract
In the past few years, the explosion of interest in social sharing on the Web has made popular the practice of publishing one's everyday life activities on the Web. The resulting availability of rich, detailed data about an individual's activities presents newfound opportunities for personal applications beyond social consumption. In this paper, we describe several systems which make use of temporal personal activity data aggregated from Web sites for several personal purposes: to help users more easily re-find their notes, automate routine reactive tasks, organize their digital resources and reflect on their personal life metrics. Each of these applications use aggregated temporal data in different ways, providing different perspectives of how temporal activity data can support interaction.

Introduction
This excitement of the social sharing on "Web 2.0" has driven the creation of a huge array of web sites and tools make of the chronicling of the minutiae of everyday life activities easy and fun. The result is that social sharing on the Web has spawned an unprecedented quantity of detailed, real-time information about people's lives. While the social implications and potential for such sharing are still being explored, we believe that this data is also useful towards solving interaction problems closer to home –

personal applications for the individual. In particular, we examine the opportunity for high-fidelity records of user activity gleaned from the Web to support the individual in the following three ways:

- *as a memory prosthesis*, e.g., to support the recall and memory of past events and information;
- *to support simple task delegation*, e.g., the construction of reactive tasks that respond to the individual's activity and save the user from having to perform these actions manually;
- and to increase the individual's self-awareness, by making salient long-term statistics of the individual's life through longitudinal analysis of the user's activities. These metrics could include time and attention spent on projects, social contact with individuals, and tracking physical life activities such as amount of exercise, sleep and nutrition.

We briefly describe applications that use temporal actiity data to fulfill each of these forms of support in the remaining sections of the paper.

Memory support for personal information-keeping

Individuals keep track of an immense quantity of information that they rely upon to effectively perform everyday tasks and fulfill daily responsibilities in work, social and personal contexts each day. This information might pertaining to reminders of tasks to be done, important phone numbers, web sites, books to read, birthdays, wish-lists, instructions on how to do things, et cetera. We examined how users create and maintain their information at work and home using current tools (both paper and software) in an artifact and interview study [1], which revealed that there are many kinds of information that people frequently need that "don't fit" or are otherwise burdensome to manage using conventional personal information management tools. For these kinds of information, people often resort to using e-mail (i.e., e-mailing themselves), or stashing information in "misc" files, folders, and post-it notes on their desks/workspaces. While these strategies result in the storage of information that affords some of the informational needs surrounding these information items (such as visibility, in the case of a post-it note, or availability in the case of e-mail), information kept using these strategies must be manually managed, and lack the facilities that more structured PIM tools readily provide: reminder alarms, multiple views (calendar/todo), and automatic filing/organization.

Therefore, we sought to develop a tool that would afford the flexible and low-effort storage and creation of information afforded by note-taking tools, but that would also support reminding and use once it was captured. Our systems, Jourknow and its successor list.it [4], apply user activity data (e.g., what the user is doing, where, and when) aggregated from the Web to learn how relevant particular notes are to various contexts/activities of people's lives. Further relevance information is computed from features extracted from the note, specifically dates, times and names of people and places and web sites, enabling the specification of "context-sensitive alarms". Finally, these relevances are then used to automatically display notes that are likely to be useful to the individual as she goes about her daily activities. Both of these systems display these learned associations to the individual, allowing them to inspect and modify these associations and

improve reminding behavior. A screen shot is visible in Figure 1.

Activity-reactive personal automation

The second application surrounds ways to relieve the user from the attentional burden of simple activity-reactive tasks. Our approach, embodied in a system called **atomsmasher** lets users specify their desired autonomous or reactive autonomous behaviors directly, by "programming" a simple reactive script to perform tasks for them. In the same way that calendar alarm/reminders and e-mail filtering functions relieve the user from paying attention to the time and each incoming email respectively, these scripts can perform an action or combination of actions in response to an event about user activity arriving from various Web streamss. For example, AM can be used to easily set up an adaptive "Away responder" that can automatically determine, based on a user's calendar entries or location, when and how to automatically reply to messages of particular types. Atomsmasher users specify behaviors using a simplified constrained natural language input interface to specify behaviors in terms of "when X happens do Y". More information about atomsmasher can be found in [1].

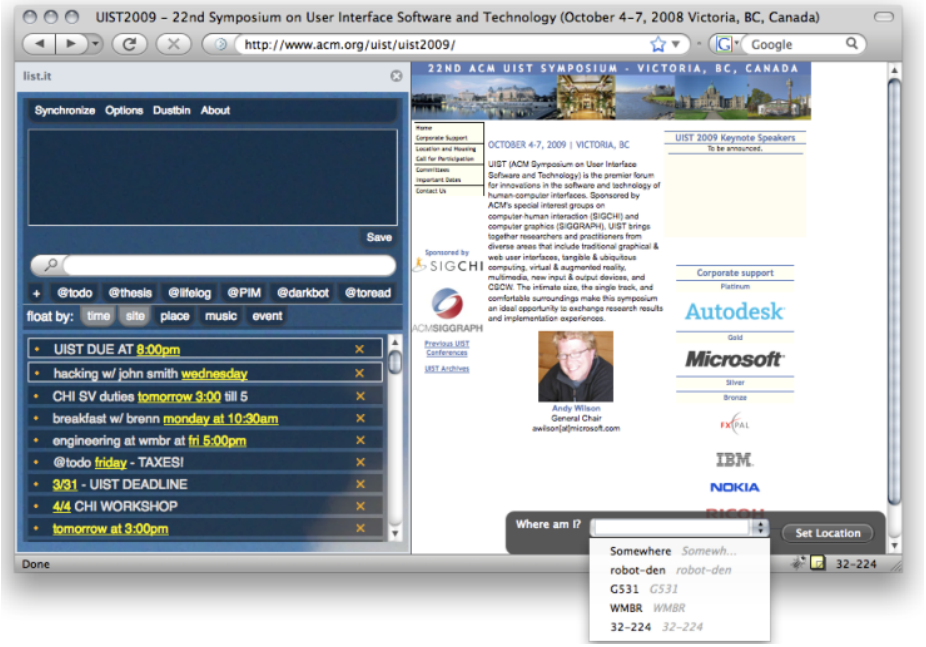

Figure 1 - List.It with Notes that Float (NTF), which supports multiple "floation modes" by content features (date/time/entities) and activity correlations.

Self-awareness and life management

Our third application seeks to let people easily reflect upon their personal information in context of their life activities. Our approach unifies three formerly separate ideas -- temporal and activity based organization of personal documents (proposed by Lifestreams [2] and [1]) and statistical visualization of life activities (introduced by services such as DAYTUM[1] and mycroscosm[2]). While the former two approaches use time and user-defined activities as organizational principles for document collections, the latter two "micro-tracking" sites facilitate automatic collection and publishing of select summaries of their life activities. Our perspective is that these systems could greatly benefit from being integrated -- enabling summaries of life activities to contextualize personal information spaces, and vice versa-- allowing personal information spaces to encourage reflection on self activity.

[1] http://www.daytum.com

[2] http://mycrocosm.media.mit.edu

To this end, we are building a life tracking service based on our user modeling framework, that provides integrated views of heterogeneously sensed activities and contexts, naturally situating interactions the user has with informational resources and people at the proper locations within these views. Although, like in Lifestreams, time the main organizing axis, instead of supporting only linear timelines, we wish to explore the use of periodic timelines that can "fold" the user's past into a single view to facilitate reflection further into the past by days, weeks or months. These views aim to make salient regular patterns (such as temporal periodicities) in certain activities, in addition to showing trend of particular activity summaries, such as increased or decreased contact with particular individuals, physical activity, nutrition, sleep, etc. We imagine that such trends might help individuals to explain/better understand their states of well-being. An early design mockup is visible in Figure 2.

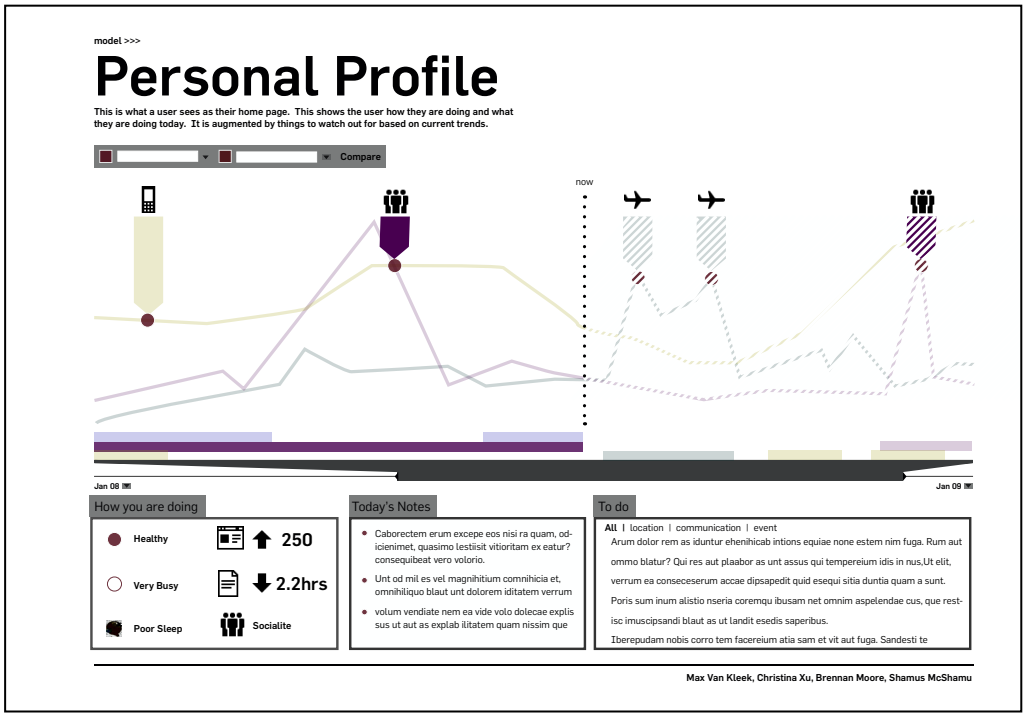

Figure 2 - Eyememine, the "activity desktop", which contextualizes personal information items in captured life activity data, to encourage self-reflection and facilitate organization.

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