Problem and Solution Overview

Our product is designed to make the scheduling of activities more portable, convenient and reliable. Many individuals, particularly those who are less comfortable with technology, prefer paper-based scheduling tools, such as post-its and planners, rather than electronic tools, such as Outlook or a Personal Digital Assistant. Pen and paper tools are flexible, reliable and easy to use. Their weaknesses, however, are that they are easy to lose, difficult to back up and are not accessible through a computer or the Internet. Our product will offer the best of both worlds, by complementing a digital pen and planner with a web site that can display and organize any event that the pen records.

Target Users

Rationale behind choice of users

We sought users who are representative of the target market for our application. In particular, we sought out people who were busy and had lots of activities to plan for. We also searched for people who represented different ages, careers and degrees of proficiency with technology.

Backgrounds of users

We conducted five interviews, two with undergraduate students, one with a graduate student, and two with young professionals.

One undergraduate is a sophomore in the engineering department. She has a moderate class load this semester, but also works in a student computer center three days a week. She is the vice president of a campus social organization and therefore has to plan a lot of events in advance. She is also a member of the mock trial team, and while this is of lower priority than class, work, and the social organization, it is still very important to her. She has a vision for her future and is constantly thinking about how to get there.

The other undergraduate is a 3rd year Haas business major. She is also very active in school groups, work, and a professional fraternity, all of which put a strain on her everyday schedule. She always carries her planner with her to keep herself organized, but at times she can find it overwhelming; she sometimes does not even have enough space to write everything so she uses post-its. She would love to use more high tech solutions, but they are much more difficult to use when compared to a simple pen and planner.

The graduate student is getting a master's degree in public policy and also works part-time doing research. She has a busy social, academic and professional schedule. She is married, so she has to share her schedule with her husband. She is in her mid-thirties. She considers herself to be "old-fashioned" and also has a slight distrust of electronic gadgets because she often finds them to be unreliable and too complex. She takes a lot of pleasure in writing things by hand.

One young professional works for a government agency. He was trained as an engineer and received a master's in business administration. He is in his mid-thirties and is married, so he too has to share his schedule with his spouse. He likes to think visually and does not like to use the computer for long hours because of health reasons. He does not consider himself to be particularly well-organized or to have a good memory.

The other young professional is an attorney at a federal government agency. She has numerous meetings to attend and many things to take care of at work, so having a solid scheduling system is important for her. She is in her early thirties. She has to use technology and computers for her work to some degree, but generally only embraces electronic gadgets if they are for entertainment, such as an iPod or digital camera.

Contextual Inquiry

Process and environment

All of our interviews were conducted in the homes of the users, often at their desks. The user could typically access any computer-based planners using a desktop or laptop and an Internet connection. He or she could also easily refer to calendars, planners or other paper-based materials as necessary.

Our interviews were typically conducted by two team members, although on one occasion there was only one available. One interviewer typically focused on asking questions, while the other concentrated on taking notes and making sure that everything was covered.

A typical interview would begin by asking the user to briefly list all the tools they use to schedule their time, from the most primitive (i.e. writing on your hand) to the most technologically advanced (i.e. setting up appointments in Outlook.) We would then have the user demonstrate to us how they used each tool.

For each tool, the user would bring the item out or lead us over to it. He or she would then go through the steps of recording activities and notes, and explain what sort of thoughts led to each process. We would observe how they entered data and ask questions about anything that we did not understand or found particularly interesting.

We typically concluded our interviews by thanking our users and presenting to them the idea of an Anoto digital pen-based scheduler. We would gather the users' impressions of the idea and ask for suggestions.

Common tasks and themes
Planners

All of our users had hand-written planners. They were typically used to record events with specific start times. Most also used it to record random thoughts and activities that were less time-sensitive, or kept a separate planner for that purpose.

Many users enjoyed planners because they could tailor them to their needs and preferences. For example, one user used different color pens to indicate the urgency of an event; another drew small picture icons to represent different kinds of tasks. A third highlighted items that were unfinished and crossed out items that were completed, while another crossed out items she no longer wanted to do and boxed the unfinished ones. Two users used the monthly overviews in their calendars to record hours of work for billing and compensation purposes, while two others exclusively used the weekly overviews. While electronic planners like Outlook often rigidly define how data is highlighted and entered, the users taught us that one of pen and paper's great strengths is its flexibility.

Because they devoted so much time to their planners, users did express some concern about the prospect of losing them. Aside from that, however, they seemed quite pleased with how their planners functioned.

Outlook and Lotus Notes

Two of our users accessed a computer-based planner, such as Outlook or Lotus Notes. Such planners allowed people to record tasks, plan calendars and invite people to meetings.

Those users who used Outlook or Lotus Notes particularly appreciated how meetings were organized in such programs. When a meeting is called, confirmation emails are sent out to all the prospective participants. If a participant clicks an "accept" button, his or her calendar is automatically updated with the meeting. The meeting host can easily see who has acknowledged receiving a invitation, send reminders, and inform participants of any changes.

Aside from this feature, however, Outlook-type programs were not enthusiastically embraced by any of our users. They always complemented their use of Outlook with a hand-written planner. Outlook-type programs were primarily used at work and to plan very time-sensitive events with clear start and end times. It was not preferred for less time-sensitive events or more general goals, and one user in particular felt that Outlook was a very public planner and required some semblance of professionalism. Planners were generally seen as far more portable, easy-to-use, and reliable.

Post-its

All all of our users used post-its to remember things. They were favored because they were convenient, highly portable and very visible. People tended to place them in prominent locations – on the inside cover of a planner, around a desktop screen or inside of a wallet, for example – so that the described events could be completed or recorded in a more permanent medium. One user made use of post-its only when his actual planner

was not readily accessible, and then transferred the contents of the post-its into the planner when he had access again. Another exclusively used digital post-its on her desktop for the purpose of general, long-term, non time-sensitive reminders.

The concept of making to-do lists visible

A key goal for every user was to tie up loose ends and ensure that all upcoming, important obligations would be looked at at appropriate times. The system typically centered around the planner. Upcoming events and obligations were recorded as promptly as possible. Finished events were crossed out or checked off, and unfinished events were either handled at some specific, regular interval, or were transferred on to a later time period. In this way users could ensure that everything that needed to be done was done, and that any upcoming obligation was recorded in a place such that a timely reminder of that obligation was inevitable.

Unique features of individual interviews

One user said that writing by hand, in addition to be being flexible and reliable, had a number of other purely psychological benefits. She noted that she remembered things better if she wrote them by hand. She also added that crossing out items on her to-do list gave her great comfort, because it made her feel as if she was making forward progress.

Another user records non time-sensitive tasks in a blank notebook, which functions as his planner. He sticks it with Velcro to the side of his desk at work, and every Friday afternoon he has an Outlook-scheduled time slot devoted to writing in his planner all the tasks he wants to do for the next week. This helps him to not think about planning responsibilities over the weekend, and gives him a fresh start on Monday.

Alternatively, a different user uses a whiteboard in her home to record tasks that are not time-sensitive. She likes this approach because the board is large and extremely visible in her room, and thus can her remind her of her long-term goals.

Task Analysis Questions

Who is going to use the system?

The users will be anyone who has many things to plan and who is not entirely comfortable with digital planning tools, such as Outlook or a Personal Digital Assistant (PDA).

What tasks do they now perform?

Users typically now organize their time with paper-based planners. With these planners, they can record upcoming events, keep track of finished obligations, and also take note of more general thoughts or goals that do not have a clear start time.

What tasks are desired?

Users seem to enjoy their planners, but they have a number of weakness that they would like to ameliorate. If the planner is not in their hands, the users lose the ability to check or revise their schedules. Moreover, because all of their scheduling is typically concentrated in one, highly portable item, losing that item would be a devastating blow. Users would enjoy the ability to backup their data.

How are the tasks learned?

Users learn how to plan through experimentation. People have very diverse methods of planning their time, even though many use similar tools, such as the portable daily planner. They try out a variety of approaches – for example, different symbols, different color pens, different strategies regarding the review and rescheduling of tasks – to see what works for them.

Where are the tasks performed?

The review and revision of planning tools can take place anywhere. Common locations include the home, in the classroom or at work. Since new appointments and activities may arise at any time, the planning tool might be accessed in inconvenient locations as well, such as in the middle of a high-pressure meeting, at a social event or while using public transportation.

What's the relationship between user & data?

The data describes the future and past of the user. It consists of discrete activities involving start and end times as well as general goals for a day or week. It may also include general ideas or inspirations, such as the name of a particularly good restaurant or the URL of an interesting web site that should be visited. The data may also involve information specifically tailored to the academic or professional pursuits of the user. Some of our users, for example, used corners of their daily planners to record work hours for the purpose of compensation.

What other tools does the user have?

In addition to the daily planner, users make use of PDAs, computer programs such as Lotus Notes or Outlook, post-its, scraps of paper and even their own forearms.

How do users communicate with each other?

Daily personal planners are typically not shared with another person. In situations where sharing was required – for example, in a marriage where the spouses may have competing obligations – a calendar was used to record and display just those events that were relevant to both of them.

How often are the tasks performed?

Planning is performed moderately to extremely often, depending on the user. Most users note items in their planners at least once a day, and check their planners multple times each day. The need to plan can take place at unpredictable moments. Many users set a specific time each week to carefully review and revise the data in their planners.

What are the time constraints on the tasks?

The time constraints on entering data into a planning tool can vary, but often are extremely tight. A user does not like taking a lot of time to record a entry when they are in the middle of a meeting, engaged in a conversation or immersed in work. Users, however, are often informed of things that they must remember and record at just those moments.

What happens when things go wrong?

The main problems with existing paper-based planning tools is that they may be left behind or lost. If a planner is left behind, the user must scramble to record upcoming events in a less convenient medium, such as their forearm or a scrap of paper. He or she must then strive to remember that record and input it into their primary planner later. Losing the primary planner, however, has typically been described as an absolute catastrophe. Users in that case have no recourse other than to buy a new planner and start all over from scratch.

Distribution of Work

- Student 1 - interviewed two users, wrote up contextual inquiries and task analysis
- Student 2 - interviewed two users, wrote up task analysis and functional summary
- Student 3 - interviewed two users, drew up interface sketches, and expanded inquiries
- Student 4 - interviewed one user and wrote up analysis of approach
- ALL - analyzed findings and conceptualized appropriate visions of interface design