

3) Analysis Questions

Analysis Question 1: What tasks do users now perform?

In order to create a semester schedule, several basic tasks must be performed:

- Student decides he wants to register for classes for the next semester
- Student decides which classes he would like to take
 - Student references the course catalogue (*not everyone does this*)
 - Student decides which classes is required and/or that he is interested in
 - Student references departmental course offerings for semester(s) of interest
 - Student references schedule (*either online or in conjunction with AmanB, or in the case of Todd through FPF*)
 - Student notes relevant course information (e.g. time, days, location, professor, Course Control Number)
- Student prioritizes which classes are most important to him (based on graduation requirements, time/days, current schedules, location, professor, gaps/no gaps, overlaps, course load, friends/study buddies)
 - Student discusses course selection with friends, advisors, professors, (prospective) employers
 - Student references graduation check-off lists to ensure on-time graduation
 - Student references online professor ratings
- Student finalizes the courses he wishes to take that semester and finds backups
- Student creates a finalized schedule in his planner/organizer (*one or a combination of the following*)
 - Student uses AmanB to list out classes
 - Student creates a graphical representation of his schedule
 - Student uses Microsoft Excel to list out classes
 - Student creates a graphical representation of his schedule
 - Student uses colors to clarify and group sections with lectures, using primary colors for lectures and corresponding lighter shades for sections
 - Student uses paper and pencil to list out classes (planner)
 - Student lists lectures and sections with dates and times
 - Student writes down final and other important events
- Student decides which classes he wishes to register [for each phase of Telebears *if he registers through Telebears*]
 - Student prioritizes based on how impacted and essential the classes are
- Student registers the classes he chooses [for the first phase *if he registers through Telebears*]
 - Student decides whether he wishes to add himself to waitlisted classes or register a backup
- Student registers the rest of his unregistered classes in the second phase (*if he registers through Telebears*)
 - Student decides whether he wishes to add himself to waitlisted classes or register a backup
- Student plans out daily schedule
 - Student uses Microsoft Outlook to list out classes as events in Calendar

- Student uses colors to clarify and group
 - Student writes down midterm(s), final, and other important events
 - Student sets priority on events
 - Student uses paper planner to list out important events
- Student modifies his class schedule accordingly (based on waitlisted courses, cancellations, etc.) if necessary
 - Student add, drops, or changes grading option on paper (*if graduate student or extension*)
- Student shares class schedule with peers, co-workers, family, etc.
 - Student arranges group meeting by determining availability using schedule

Analysis Question 2: What tasks are desired?

Over the course of contextual analysis interviews, the variety of desired tasks varied from user to user and so did the extent to which they desired it. The tasks fell into three separate categories: tasks that both we and the users desired, tasks that only the users desired, and tasks that we thought the users would desire.

The users independently mentioned many desired tasks we had brainstormed. This cemented their desirability in our minds. These are:

- The ability to view class locations geographically (Todd, Anh)
- The ability to find distances between classes (Todd, Anh)
- The ability to import/export his schedule to a different format (Ali, Anh).

The ability to input their schedule into the application and, at the user's scheduled Telebears appointment, have the application automatically register for classes based on the importance rating assigned to each course was not mentioned by the users (Ali, Anh); but, when we asked for their thoughts, was found desirable.

Lastly, there were tasks that users desired which we had not previously considered. These are:

- Consideration of visually impaired citizens when making the application (Anh).
- A menu-based manner to add classes, which would filter the list of classes displayed according to some fields like selecting the major, then the class number followed by the discussion number (Maggie).

Analysis Question 3: How are the tasks learned?

Tasks are learned in a variety of ways, depending on the type of task. The task of learning to use Telebears is done during CalSo orientation. During CalSo, students are split up by college and given the requirements and paperwork with suggested four year plans. Counselors explain how AP classes apply and when students should retake core classes.

Students are walked through the process of looking up classes using the paper version of the schedule. Students are walked through the waitlist system. Strategies are not taught; only policy is given out. Students are told to highlight the classes and sections they want. Then, through Telebears, the students sign up for classes using course control numbers.

Students learn to use custom scheduling systems from their friends or by themselves. For example, Maggie learned how to navigate the AmanB scheduler through her dorm mates.

Over the years, students will refine the schedule making process, depending on what works well and what doesn't. For example, Anh moved from using the paper schedule to look up his classes to using an online schedule. He found that the online schedule was more readily accessible and more convenient.

Analysis Question 4: Where are the tasks performed?

The interviewees and their respective locations are discussed below in order.

Todd -

Online at Home:

- Searched Fall Program for freshmen
- Read about professors on Berkeley website

At Home:

- Mom helped with Excel layout of schedule

In Dorms/ at Frat House:

- Talked about positives and negatives of professors
- Scheduling paperwork for FPF done at home

On Campus:

- Went to FPF program office for advice on professors

Ali -

Online at Home or in Soda Hall on Laptop:

- Looked at professor ratings on HKN site
- Searched schedule.berkeley.edu for class times
- Signed up for class on Telebears

At Home:

- Planned class schedule on paper by listing days and times
- Entered schedule into Outlook

In Campus:

- Talked with professors and advisors about useful classes for grad school

At Workplace:

- Talked with boss about useful classes for industry

Maggie -

Online at Home:

- Laid out schedule on AmanB
- Signed up for class on Telebears

At home:

- Produced Excel spreadsheet for long term plan

Anywhere:

- Chose classes in course catalog

Anh -

Online at Home:

- Looked at schedule.berkeley.edu

At Home:

- Looked at City and Regional Planning department internal schedule
- Used Excel for weekly class schedule
- Used Excel for organizing meeting times for group projects

It goes to show that the users who possess a laptop have more freedom with the location of their activities but still prefer to handle matters like this at home or at their frat in the company of others while asking for their advice.

Analysis Question 5: What is the relationship between user and data (personal, private, public, meaning to the user, *etc.*)?

Relevant data available to the user includes:

- Class Availability (semester Offering, Capacity)
- Class Time
- Class Location/distances Between Classes
- Class Prerequisites/restrictions
- Professor Teaching The Course (ratings/opinions)
- Finals Schedule
- User's Non-Academic Schedule
- Graduation/major Requirements
- Academic Deadlines (e.g. Add/Drop)
- Course Descriptions
- Personal Interest in a Course/Subject Area
- Projected Course Difficulty

All this data is available and may be considered while creating and adjusting a class schedule. Each piece of data may carry a different amount of importance depending on the user.

Graduation requirements were universally considered as the main constraint for course choice. Other data that seemed to play a large role in the decision-making process of the interviewed users included as follows in professor ratings/reputation, personal interest, class time and gaps between classes.

Private: Certain data must be kept private and only accessible by the user. Currently only the user has access to their progress towards degree; since this is potentially sensitive information, it should be kept private.

Personal: Personal data may be shared with certain other users. If a student inputs his class schedule into an online course scheduler (e.g. AmanB), it becomes accessible by anyone the student chooses to share the information with. Also, through AmanB, anyone who is able to access the user's information is also able to modify it. Often users may desire to share their data, but the amount of access should be determined by the user and default to a protected state.

Public: All other data is public - it can be accessed by any user. Information such as class availability, class time, professor ratings, &etc., can be accessed through public channels.

Analysis Question 6: What other tools does the user have to complete the tasks?

One might debate that from a certain perspective, we are building a tool that others will use for interaction with another application. But from the developer's perspective, we believe that we are building a higher-level application that will allow multiple applications to build on each other.

The users used a limited number of different tools for the purpose of scheduling and planning their courses.

- Telebears to register for classes
- schedule.berkeley.edu for choosing classes
- Excel or paper and pen for creating visual layouts of classes

Everyone used pen and paper to write down their classes and timings and there was a common tendency to manually find conflicts though Anh tends to audit multiple classes and hence signs up for many courses regardless of clashes. Not surprisingly, no one enjoyed the task of manually going through the list and looking for clashes.

Microsoft Excel was the application of choice when it came to visualizing class schedules or planning for future semesters. We have to take into consideration varying levels of computer skills and if possible have a simple tutorial on how to use the application. Some of the candidates, like Todd, had difficulty using Excel, but others taught them how to use the application. Others, like Ali and Maggie, were quite proficient with Excel.

Microsoft Outlook was used by both Ali and Anh. While Ali used Outlook to lay out all his classes, discussion, parties, etc into the Calendar, Anh focused on major events like midterms, project due dates, paper due dates, etc. Both had few complaints about MS Outlook though Ali would have preferred more freedom with the selection of colors. This made us realize that we definitely should not try to create a daily planner as the users will be more reluctant to switch from an application they are comfortable with.

Finally, AmanB was another tool used only by Maggie; she used it to get a visual display of her weekly class schedule and find conflicts. She said that adding personal events was not too hard to figure out since she was fairly competent with computers.

Analysis Question 7: How do users communicate with each other regarding the tasks?

When users are planning classes, they often consult with their peers to get advice about what classes and/or professors are good, as well as strategies for getting into as many desired classes as possible. Ali for instance would really like a feature which displayed the HKN ratings of professors without the need for him to visit the HKN website. In the case of Maggie, her roommates would join her while she was registering for classes and give her their opinion on the courses under consideration. Schedules are shared to help determine section choice. Some also talk to their departmental advisors or (prospective) employers regarding class choice.

Users also communicate with each other when scheduling business meetings or personal gatherings. For instance, Anh had an excel file which helped him gauge the free time of his friends. Often, schedules themselves are not explicitly transferred, but information gathered implicitly from them (available or not-available times) is.

Analysis Question 8: How often are the tasks performed?

The entire cycle of tasks is repeated each semester. The frequency of the performance of each task varies depending on the task and sometimes depending on class availability. For example, if the student is lucky and the classes he chooses to take are registered without any issues, then he will more than likely not have to repeat any task and rework his schedule.

Reworking the schedule can be a cyclic process, and can be repeated as many times until the student absolutely finalizes his/her schedule. Most corrections, such as adding, dropping, and changing grading options, take place during the first two weeks of each semester as mentioned by Anh and Ali. Though untested, it is very likely that setting the grading option

could now very well go up to the tenth hence leading students to visit their schedules later than normal.

Analysis Question 9: What are the time constraints on the tasks, if any?

There are several time constraints on the tasks that must be considered. They are:

- Add/drop deadline in the fifth week of instruction - This is most important because, changes to the class schedule after this time can generally not be made.
- Telebears Phase I & II - It is advantageous to sign up for a course as soon as possible because impacted courses often fill up quickly. Depending on waitlist requirements, registering for available classes during Phase I may be a better choice.
- Start of instruction - A student generally wants to add a course before instruction begins, in order to miss as little instructional time as possible.
- Changing grading option/course units deadline - A student can choose whether to take a course for a letter grade or on a pass/no pass basis. For certain courses, the student may choose to adjust the number of units that a course is worth. These affect the amount of time and commitment that a course requires.

Analysis Question 10: What happens when things go wrong while performing tasks?

If the primary method for performing a required task failed or became inaccessible, then the user defaulted to the secondary option. For example, Maggie was unable to locate her paper copy of the course catalog; thus, she resorted to the online version and listed prospective classes using paper and pen.

Additionally, Maggie was unhappy with the new Bearfacts layout. She said she was frustrated with "clicking around" because she did not already know the hierarchical structure of the site. She wanted to see submenus along with the menus. As a result, she avoided using Bearfacts.

Ali was observed using the back button while running searches on schedule.berkeley.edu. While this is not a problem as the back button does not function correctly for schedule.berkeley.edu, it could pose a problem for potential sites we design using JavaScript. We have to plan ahead for people who use the back button, but really mean to run a brand new search.

Ali also preferred using MS Outlook versus a web-based application. Previous experiences with web-based scheduling applications failed when he did not have Internet access. Since then, he avoids any such applications.

Both Todd and Anh used a paper-based system, which is generally more failsafe.

If an essential backend system, such as Telebears, fails, then it's impossible to perform dependent tasks.