cisc3650
human-computer interaction
spring 2012
lecture # III.2
human activities: what users do

topics:

- evaluation techniques
- usability testing

references:

- *Designing Interfaces*, by Jenifer Tidwell, chapter 1, What users do.
- *Leonardo's Laptop: Human needs and the new computing technologies*, by Ben Shneiderman, chapter 5, Understanding human activities and relationships.

what users do

- UI (user interface) design starts with understanding the needs of the users
- think of "interaction" like a "conversation"
  - user tells computer what s/he wants
  - computer provides feedback
  - what *vocabulary* does the user employ?
  - what does the user expect the computer to do?
  - how does the user expect to receive feedback from the computer?
- remember that the software designer and software engineer are NOT the user!
- understanding the user means focusing on *human behaviors* rather than system behaviors (which is what software engineers typically do)

software as a tool

- most software is a *tool* to help a user accomplish some task
- identify the user's end goal
- for example, the goal of filling out a college application (like your first homework assignment) is to get accepted into a college—not to fill out a form
- identifying the end goal helps prioritize the elements of the system
- some systems (tools) may be used for more than one end goal, and more than one user audience—design for a range of user types
- also, users will vary in the amount of experience and skill they have in using the tool—design for a range of skill levels

user research

- identify the target audience
- be cognizant of gender, personality and cultural differences of users
- goals of user research are to understand:
  - users' goals (with using the software)
  - tasks users will undertake to achieve the goal(s)
  - vocabulary users will employ when describing and accomplishing the tasks and goals
  - range of users' skill levels at addressing the task and using the software system
  - range of users' attitudes towards the software system
- ways to conduct user research:
  - direct observation— interviews, onsite visits with users
  - case studies— detailed views of a small number of representative users
  - surveys— written information gathered from a large number of users
  - personas— models (fictional) of the types of users

- user research is different from *market research* because goal of market research is to understand the person who *buys* the product; whereas goal of user research is to understand the person who *uses* the product

user adaptivity

- try to ascertain how much the users will be motivated to *learn* how to use the system
- identify skill levels of users and proportion of each that can be expected:
  - novice, first-time user
  - infrequent, occasional user
  - frequent, expert user
- consider the user learning trajectory to go from novice to competent user
- what type of help will the user be likely to invoke?

patterns of user behavior

1. safe exploration
   let user explore without getting into trouble. support functions like "undo" and "go back". provide warnings about and before destructive actions.
2. instant gratification
   show user success quickly. make first things typically done easy to achieve.
3. satisficing
   most users are happy with "good enough". designer advice: give directions to user. make labels short and easy to read. layout of interface should convey meaning. interface navigation should be easy. keep cognitive load low. make it hard to (learn to) do things wrong.
4. changes in midstream
   let users change their mind about what they are doing in the middle. let users stop, save and come back later.
5. deferred choices
   let users skip some steps and come back to them later. don't give user too many choices in the beginning of a task. clearly mark required fields on a form. prioritize important

inputs and try to keep these to a short list; then show other ones later (or let user control displaying of these). use good defaults when possible. make it easy to return later to enter deferred inputs. let users "try" before registering.

6. incremental construction
   don't expect everyone to do things in the same sequence. let users build a little bit at a time.
7. habituation
   support users' habits by following conventions and standards for keystrokes and naming of common functions. be careful of default action in response to dialog boxes: don't let default action do something destructive.
8. microbreaks
   support tasks that user can accomplish with short amounts of time, e.g., simple tasks or bigger tasks broken up into many sub-tasks that can each be addressed one-at-a-time and resumed later.
9. spatial memory
   people remember where things are on the interface, so use that to your advantage.
10. prospective memory
    support "note to self", i.e., reminders from user to her/himself about things to do later.

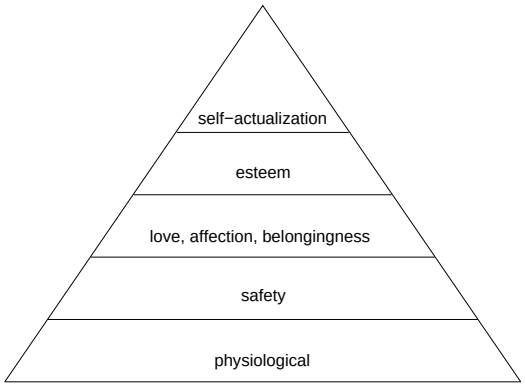
reminder systems.

11. streamlined repetition
    give users way to create "macros" for things that are frequently done repeatedly.
12. keyboard only
    don't make people use the mouse all the time. but also don't make them memorize too many keyboard commands. make frequent commands easy to remember and use with keyboard shortcuts.
13. other people's advice
    allow place for users to leave each other comments. advice about how to use the system, about what works and doesn't work.
14. personal recommendations
    let users connect with each other through common and/or social media; e.g., allow URL to be copied-pasted; support connection to facebook.

understanding human activities and relationships

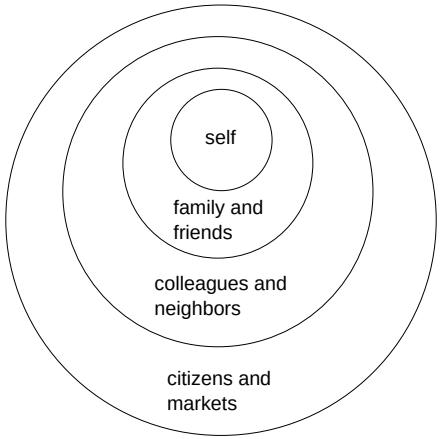
- how do you use computers and technology?
- how do your friends and family use computers and technology?
- activities include:
  - collecting information
  - communicating with others
  - collaborating with others
  - designing interfaces
  - distributing ideas
- what is the frequency of these activities?
  we expect that frequencies vary from one user to another!

maslow's hierarchy of human needs



- needs of the individual:
  - physiological: survival, food, water, ...
  - self-actualization: fulfillment of personal goals
- needs of others:
  - safety: secure person, house, ...
  - love, affection, belongingness: social, giving, receiving, ...
  - esteem: self-respect, respect for others, self-confidence, ...

circles of relationships



- four circles of relationships:
  - self $= 1$ person
  - family and friends $= 2 - 50$ people
  - colleagues and neighbors $= 0 - 5000$ people
  - citizens and markets > 5000 people
- characterized by:
  - size
  - degree of interdependence
  - shared knowledge
  - trust

four stages of activities

- the creative process is an activity that has four stages:
  1. collect/information (e.g., surf web, read books)
  2. relate/communication (e.g., ask friends)
  3. create/innovation (i.e., interpret what has been collected and communicated)
  4. donate/dissemination (e.g., pass new knowledge/information on to others)
- try and apply this to the activities you do, i.e., identify the 4 stages in your daily activities

ART: activities and relationships table

ART	collect information	relate communication	create innovation	donate dissemination
self	digital photo import		photo diary PhotoShop	
family and friends	PhotoMesa family albums	Photo-sharing on web sites	StoryStarter Export to web	Family photo histories
colleagues and neighbors	PhotoFinder kiosk	Neighborhood photo sharing		
citizens and markets	Library of Congress		PhotoQuilt	Web sites for photo exchange

mobility and ubiquity

- smaller devices: easy to carry around
- wireless communications: easy to get online anywhere
- technology is more portable
- create ART (activities and relationships table) for mobile devices