CPEN441: user interface design

user **centred** approaches to design

when we're done this topic…

understand:

- why it's important to involve users in design
- the principles of a user-centred approach
- participatory design
- ethnography
- contextual design + the affinity diagram

system centred design

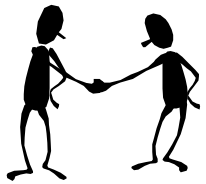
- what can be built easily on this platform?
- what can I create from the available tools?
- what do I as a designer find interesting to work on?

why involve users in design?

- functionality:
  - what's wrong with designers just role-playing?
- expectations:
  - what are ways to manage expectations?
- ownership:
  - what will make it a success? *users want to be heard*
- innovation:
  - what exciting practices arise from use?

user centred system design

design is based upon a user's
- abilities and real needs
- context
- work
- tasks



golden rule of interface design:

"Know Thy User"

also:

"fail often, fail fast"

user centred system design

- Knowledge about and involvement of users in the design process is a central concern.
- involve users (throughout design!), including…
  - observing users' working practices as part of collecting system requirements
  - using psychologically-based user modeling techniques
  - including user representatives on the design team

example

• you're designing a new e-commerce site for an existing popular home improvement superstore.

• what are some activities you might do to initiate a "user centered" approach to this design project?

hints:

• who are the users?

• what are their tasks and goals?

• what are their current patterns/contexts of behaviour?

challenges to involving users

- expensive and time consuming
  - many software projects have very short lead times
  - users have other things they need to be doing
- can disrupt the design process
  - users who are part of a design team may ask for changes that are hard, or at an inopportune time
  - users aren't always able to articulate what they want

methods for involving the user

- uncontrolled studies
  - emphasis on ecological validity
  1. participatory design
  2. ethnography
  3. contextual design

  This module
  4. questionnaires
  5. interviews
  6. observation
- controlled studies
  - emphasis on statistical validity
- minimally, talk to users
  - describe what you're going to do
  - get input at all design stages
  - important to have visuals and/or demos
- bottom line: learn their job/life and feedback into design

participatory design

- users become 1st class members in the design process
  - active collaborators vs passive participants (e.g., interviewees)
- users considered subject matter experts
- iterative process: all design stages subject to revision

side note: origins in Scandanavia

1. participatory design

- up side
  - users are excellent at reacting to suggested system designs
    - designs must be concrete and visible
  - users bring in important "folk" knowledge of work context
    - knowledge may be otherwise inaccessible to design team
  - greater buy-in for the system often results
- down side
  - hard to get a good pool of end users
    - expensive, reluctant ...
  - users are not expert designers
    - don't expect them to come up with design ideas from scratch
  - the user is not always right
    - don't expect them to know what they want
  - conservative bias to perpetuate current practices
    - don't expect them to fully exploit the potential of new

2. ethnography

- origin: anthropology
- basic idea: studying people "in the wild"
- research ethnographers attempt to understand a workplace through *immersion*, extended contact, and subsequent analysis
- most useful very early in development, build an understanding of existing (work) practices thorough enough to illuminate the possibilities for and implications of introducing technology
- ethnographic studies most often provide warnings – detailed descriptions of work practices that new technology may disrupt
- e.g., Lucy Suchman, formerly at Xerox Parc, ethnography of air traffic controllers

2. ethnography

- up side
  - comprehensive understanding of current (work) practices
  - greater ability to predict the impact of a new or re-designed technology
  - possibly greater buy-in for the system

- down side
  - principal cost is time, both the ethnographer's and the users'
  - could perpetuate negative aspects of current practices
  - can produce vast (unmanageable) amount of data
  - output is description of practices, rather than specific designs
    - ethnographers are not trained as designers; taught to "interfere" as little as possible with the community

3. contextual design

- structured method for gathering and representing information from fieldwork (such as ethnography)
- … to bring it into the design process

- some call it an *ethnographic-based* approach

- aspects relating to understanding user's work:
  1. contextual inquiry
  2. work modeling
  3. work consolidation

3. contextual inquiry

- between observation and interview
- *gist:* intensely interview people while they work

principles:

1. context:
   - the best way to understand work practice is to talk to people in their actual work environment
   - people speak about their work in abstractions – often presenting an idealized model
   - differentiate between summary info and ongoing experience – most people do not conceptualize their work, they just do it!
   - access ongoing experience: being present in the work context leads to more information

3.1 contextual inquiry principles, cont.

2. partnership:
   - users are the experts – they are the ones doing the work!
   - share control during the inquiry –
     users have the information we want to know
   - creating shared meaning –
     to prevent self-listening, share design ideas *as they occur*
   - reflection and engagement –
     engagement occurs through active listening;
     reflection occurs when we stop to integrate new information into our evolving understanding
3. focus
   - don't try to understand the full organizational culture
   - maintain focus in order to complete the inquiry in a reasonable amount of time

3.2 conducting a contextual interview

1. identify users
2. arrange visit (typically one day)
3. select initial users (consider roles you want to cover)
4. use multiple interviewers if possible
   (to cover as many users as possible, and/or to bring different perspective)
5. set the focus before the interview
6. structure the interview:
   - *introduction*: establishing a relationship
   - *ongoing work inquiry*: users works, interviewer observes and occasionally asks questions
   - *wrap up*: summarize what was learned, ask if possible to call with further questions, invite user to forward further comments

3.3 work modeling: analyzing contextual inquiry information

1. transcribe the interview
2. fix the focus of analysis
3. record understandings: coded transcripts or post-It notes
   - description of users' work
   - flow or structure of the work
   - description of problems in their work
   - description of problems with the computer tools
   - design ideas that emerge from understanding of their work
   - questions for subsequent interviews

3.4 contextual inquiry: work modeling

- **encapsulate** and **document** understanding from study
- several different aspects of work can be modeled (examples in text).
- some or all might be relevant:
  - work flow: diagram of players, responsibilities, and the path that individual tasks take among them
  - sequence: like a paper prototype / task model: have to understand the goals clearly or result will be pointless
  - artifacts: objects. *examples?*
  - culture: reflects the organization's attitudes, practices, taboos, unwritten laws
  - physical / space: local and remote layout; physical workflow

3.5 work consolidation: *abstracting specific insights*

- one tool: the **affinity diagram**
- can use to "consolidate" insights from
- any one of the work models
- all of them together
- or on data collected in other ways for example:
  - brainstorming about design problems → **categories of problems**
  - brainstorming about design ideas → **categories of ideas**
  - comments from users → **categories of desirable / successful features**

3.5.1 how do you make an affinity diagram?

1. team writes down all data & insights on post-it notes; be sure you can link the post-it back to its source!
2. stick one post-it on the wall
   a whiteboard or big sheet of butcher paper is best
3. arrange the other post-its around it, **grouping** by affinity to each other. **iteration** will be required.
4. look at each group and see what it has in common; **name and describe** each group.
5. "**snapshot**" the result for documentation
   1. digital photo → your design website or notebook
   2. transfer post-its onto paper, 1 sheet / group → scan → website

3.5.1 why does an affinity diagram work?

- use physical arrangement/proximity to understand connections
- openness to serendipity
- low cost to rearrange ideas
- many variants:
  - arrange along axes rather than by affinity
  - tie causes to effects
  - group evidence under assertions

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summary

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