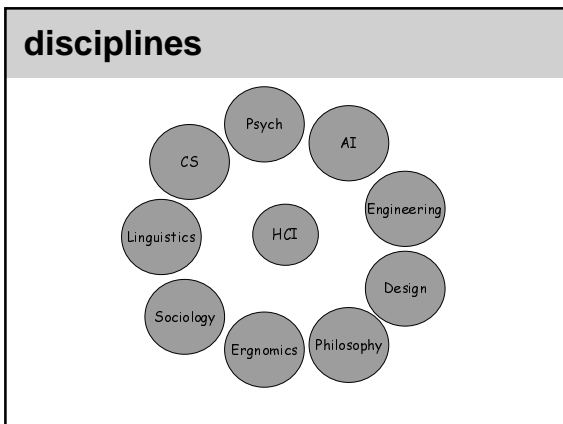


- administrivia**
- textbook
 - Preece, Rogers, Sharp, Benyon, Holland & Carey
 - we'll be following this for first 5-6 weeks
 - adding and dropping
 - project teams
 - discussion sections



- disciplines**
- interdisciplinary work is hard!
 - people don't share perspectives
 - different use of terms
 - different foci of interest
 - different approaches to experimentation and evaluation
 - it's hard to see the other person's view
 - their stuff doesn't look like your stuff
 - your judgments of good and bad may not apply

computer science

- algorithms and techniques
 - data visualisation and graphics
 - screen layout
- tools and technologies
 - tools for building user interfaces
 - user interface toolkits
 - techniques – OOP, constraints,

disciplines

- cognitive psychology
 - basically, the psychology of thinking
 - the defeat of behaviorism
 - mental phenomena – planning, perception, memory
 - the psychology of HCI
 - how can people figure out what to do?
 - the gulf of execution
 - how can they figure out what's going on?
 - the gulf of evaluation

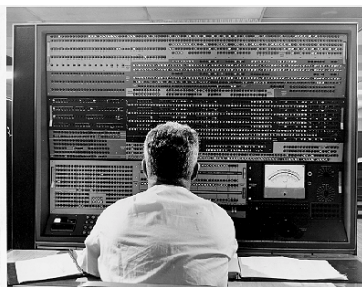
cognitive loads

- memory
 - “please enter the 15 digit code from the last dialog box”
 - the magic 7 ± 2
- calculation
 - “your job will be completed in c. 14326 seconds”
- the most important thing to remember
 - the user’s “task” isn’t “using the computer”
 - don’t want to impose extra load on someone who’s...
 - performing brain surgery, conducting financial transactions, driving a car, pointing a missile, calculating your grades, or pretty much anything else.

formalizing theories

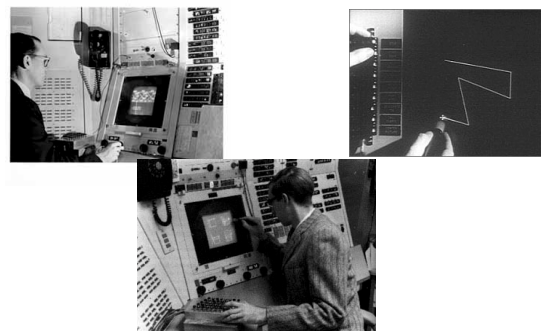
- the Holy Grail of (1980s) psych/HCI
 - first, formalized models of human performance
 - second, design methods that incorporate theories
 - automatically analyze design
 - automatically analyze task needs
 - predictive performance measures
- but...
 - most cognitive models turn out to be
 - highly decontextualized
 - too hard for non-modelers to use

before hci...



the IBM Stretch front panel

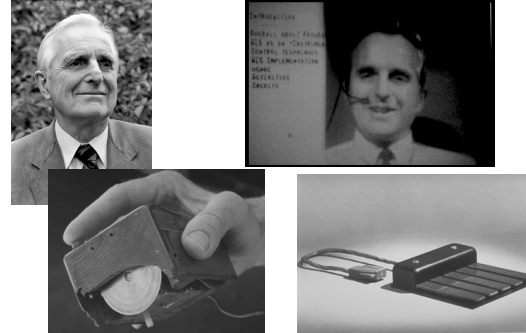
sketchpad



what was radical?

- many technical breakthroughs
 - zooming interface
 - constraint-based interaction
 - object-oriented model (instance-based)
- tightly coupled interaction
 - the computer responds in real time
 - think of rubber-banding
 - “needless” display of intermediate states

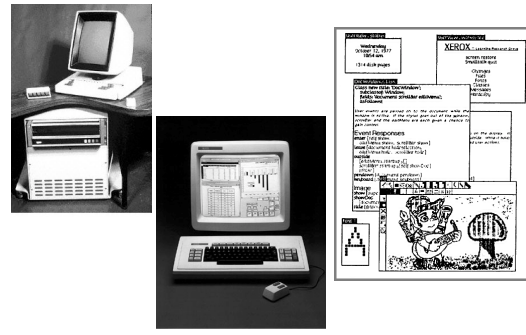
augment/nls



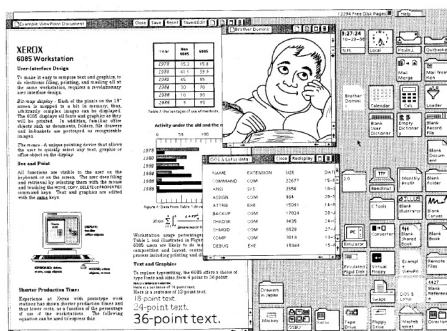
what was radical?

- lots of technology
 - shared views, the mouse, chord keyboard, hypertext, structured editing, ...
- but also the fundamental idea
 - the computer as a tool for thought

alto and star



alto and star



alto and star



what was radical?

- the idea of *personal computing*
 - all those resources devoted to a single user!
 - the user as the central focus for design
 - systematic metaphor
 - graphical design

not just the GUI...

- "And they showed me really three things. But I was so blinded by the first one I didn't even really see the other two. One of the things they showed me was **object oriented programming** they showed me that but I didn't even see that. The other one they showed me was a **networked computer system**...they had over a hundred Alto computers all networked using email etc., etc., I didn't even see that. I was so blinded by the first thing they showed me which was the **graphical user interface**. I thought it was the best thing I'd ever seen in my life. Now remember it was very flawed, what we saw was incomplete, they'd done a bunch of things wrong. But we didn't know that at the time but still though they had the germ of the idea was there and they'd done it very well and within you know ten minutes **it was obvious to me that all computers would work like this some day.**"

-- Steve Jobs

gui design principles

- direct manipulation
- consistency
- making opportunities for action visible

- how do we achieve each of these?

affordances

- "knowledge in the head" versus "knowledge in the world"
 - the world imposes constraints
 - constraints can make things easier for us
 - physically
 - cognitively
 - examples:
 - door handles
 - the VGA plug for my laptop

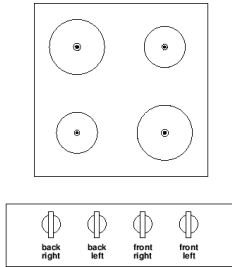
affordances

- an affordance is "a *property of the world that affords action to appropriately equipped individuals*"
 - three-way relationship
 - a coupling of *perception* with *action*
 - how you move around affects how you see
- examples
 - chairs afford sitting (if...)
 - knobs afford turning (if...)
 - buttons afford pressing
 - doors: vertical plates and horizontal bars

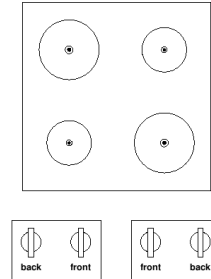
affordances



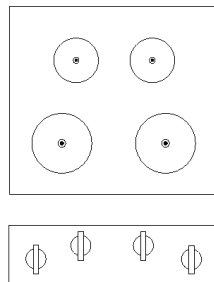
affordances



affordances



affordances



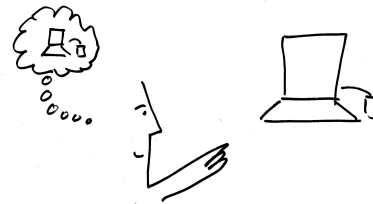
affordances and design

- affordances as a model of perception
 - don't see objects, see *opportunities for action*
- design is about
 - creating affordances
 - making them visible
- examples
 - my kettle
 - the Sonic Finder

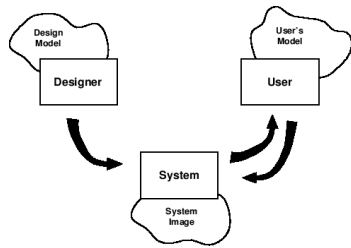
affordances and design

- beware of cultural conventions
 - light switches
 - in the US, up is "on" and down is "off"
 - in the UK, up is "off" and down is "on"
 - the color red
 - in the US: danger
 - in Egypt: death
 - in India: life
 - in China: happiness

mental models



there's more than one model

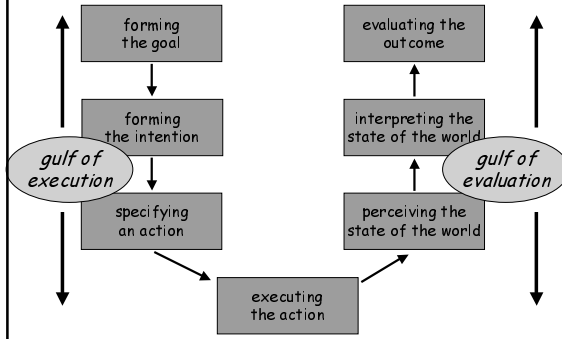


the system image

- how is the model of use conveyed?



norman's seven-step model



next time

- no lecture Tuesday (I'm away)
- Thursday – Engineering for Usability
 - read ch 17, 18.2, 18.4, 22.3, 27.1, 27.2, 29