

HUMAN-COMPUTER INTERACTION THIRD EDITION
DIX FINLAY ABOUDD BEALE

chapter 5
interaction design basics
(extract)

HUMAN-COMPUTER INTERACTION

interaction design basics

- design:
 - what it is, interventions, goals, constraints
- the design process
 - what happens when
- users
 - who they are, what they are like ...
- scenarios
 - rich stories of design
- navigation
 - finding your way around a system
- iteration and prototypes
 - never get it right first time!

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interactions and interventions

design interactions not just interfaces
not just the immediate interaction
e.g. stapler in office – technology changes interaction style

- manual: write, print, staple, write, print, staple, ...
- electric: write, print, write, print, ..., staple

designing interventions not just artefacts
not just the system, but also ...

- documentation, manuals, tutorials
- what we say and do as well as what we make

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what is design?

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what is design?

achieving goals within constraints

- goals - purpose
 - who is it for, why do they want it
- constraints
 - materials, platforms
- trade-offs

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golden rule of design

understand your materials

for Human-Computer Interaction

understand your materials

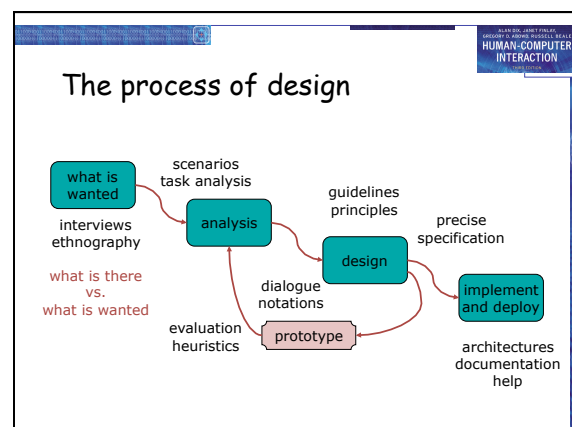
- understand computers
 - limitations, capacities, tools, platforms
- understand people
 - psychological, social aspects
 - human error
- and their interaction ...

To err is human

- accident reports ..
 - aircrash, industrial accident, hospital mistake
 - enquiry ... blames ... 'human error'
- but ...
 - concrete lintel breaks because too much weight
 - blame 'lintel error' ?
 - ... no - design error
 - we know how concrete behaves under stress
- human 'error' is normal
 - we know how users behave under stress
 - so design for it!
- treat the user at least as well as physical materials!

Central message ...

the user

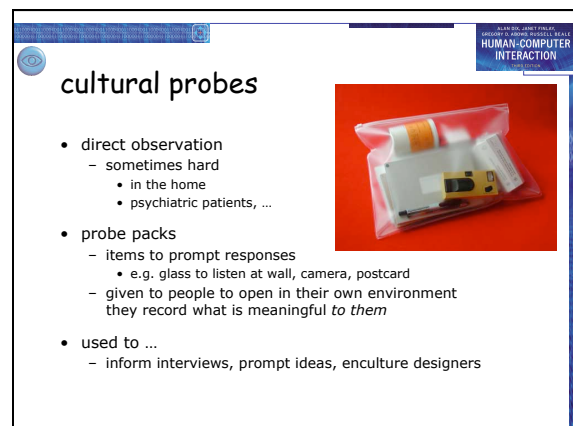
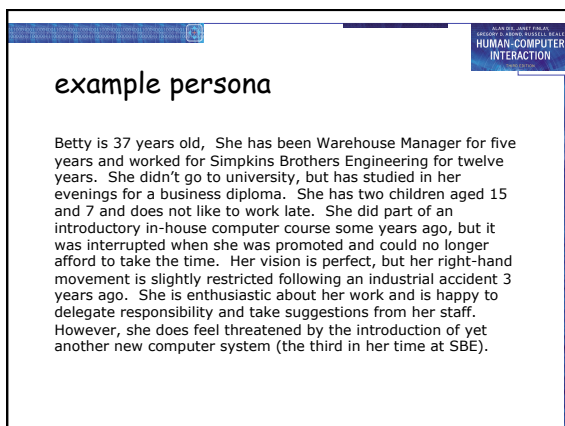
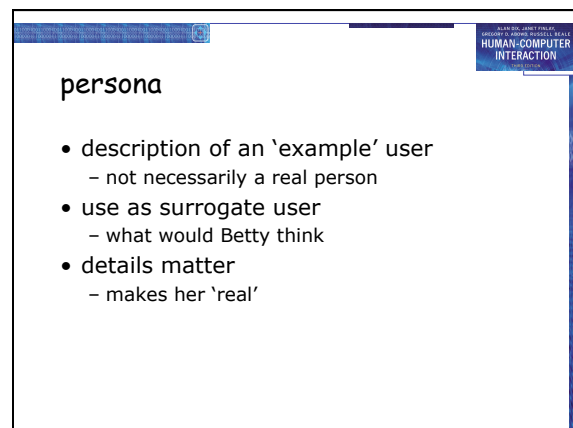
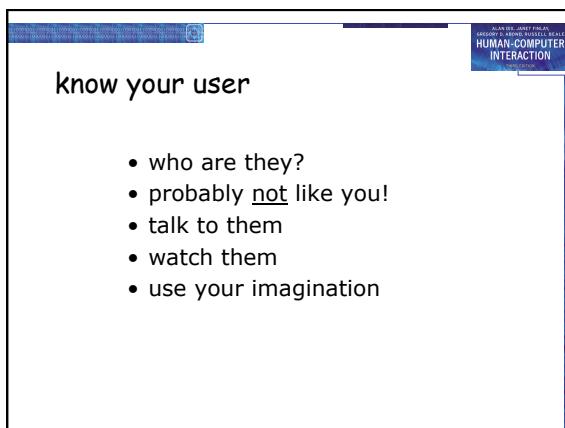
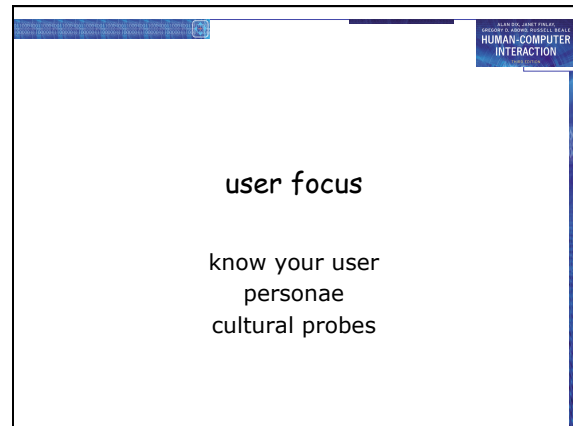
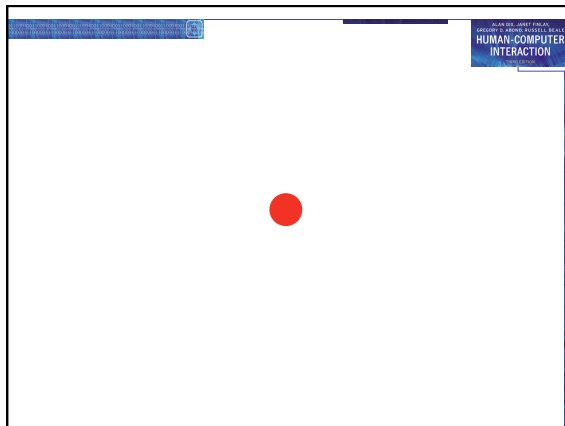


Steps ...

- requirements
 - what is there and what is wanted ...
- analysis
 - ordering and understanding
- design
 - what to do and how to decide
- iteration and prototyping
 - getting it right ... and finding what is really needed!
- implementation and deployment
 - making it and getting it out there

... but how can I do it all !!

- limited time \Rightarrow design trade-off
- usability?
 - finding problems and fixing them? **X**
 - deciding what to fix? **✓**
- a perfect system is badly designed
 - too good \Rightarrow too much effort in design



scenarios

stories for design
use and reuse

scenarios

- stories for design
 - communicate with others
 - validate other models
 - understand dynamics
- linearity
 - time is linear - our lives are linear
 - but don't show alternatives

scenarios ...

- what will users want to do?
- step-by-step walkthrough
 - what can they see (sketches, screen shots)
 - what do they do (keyboard, mouse etc.)
 - what are they thinking?
- use and reuse throughout design

scenario - movie player

Brian would like to see the new film "Moments of Significance" and wants to invite Alison, but he knows she doesn't like "arty" films. He decides to take a look at it to see if she would like it and so connects to one of the movie sharing networks. He uses his work machine as it has a higher bandwidth connection, but feels a bit guilty. He knows he will be getting an illegal copy of the film, but decides it is OK as he is intending to go to the cinema to watch it. After it downloads to his machine he takes out his new personal movie player. He presses the 'menu' button and on the small LCD screen he scrolls using the arrow keys to 'bluetooth connect' and presses the select button. On his computer the movie download program now has an icon showing that it has recognised a compatible device and he drags the icon of the film over the icon for the player. On the player the LCD screen says "downloading now", a percent done indicator and small whirling icon.

also play act ...

- mock up device
- pretend you are doing it
- internet-connected swiss army knife ...

but where is that thumb? 😞



use toothpick as stylus 😊

... explore the depths

- explore interaction
 - what happens when
- explore cognition
 - what are the users thinking
- explore architecture
 - what is happening inside

use scenarios to ..

- communicate with others
 - designers, clients, users
- validate other models
 - 'play' it against other models
- express dynamics
 - screenshots - appearance
 - scenario - behaviour

linearity

Scenarios - one linear path through system

Pros:

- life and time are linear
- easy to understand (stories and narrative are natural)
- concrete (errors less likely)

Cons:

- no choice, no branches, no special conditions
- miss the unintended

• So:

- use several scenarios
- use several methods

navigation design

local structure - single screen
global structure - whole site

levels

- widget choice
 - menus, buttons etc.
- screen design
- application navigation design
- environment
 - other apps, O/S

the web ...

- widget choice
- screen design
- navigation design
- environment
- elements and tags
 -
- page design
- site structure
- the web, browser, external links

physical devices

- widget choice
- screen design
- navigation design
- environment
- controls
 - buttons, knobs, dials
- physical layout
- modes of device
- the real world

think about structure

- within a screen
 - later ...
- local
 - looking from this screen out
- global
 - structure of site, movement between screens
- wider still
 - relationship with other applications

local

from one screen looking out

goal seeking

goal seeking

progress with local knowledge only ...

goal seeking

... but can get to the goal

goal seeking

start

goal

... try to avoid these bits!

four golden rules

- knowing where you are
- knowing what you can do
- knowing where you are going
 - or what will happen
- knowing where you've been
 - or what you've done

where you are - breadcrumbs

shows path through web site hierarchy

web site top level category sub-category this page

live links to higher levels

Some common errors arise again and again in statistics
Here are some to watch out for

beware the big button trap

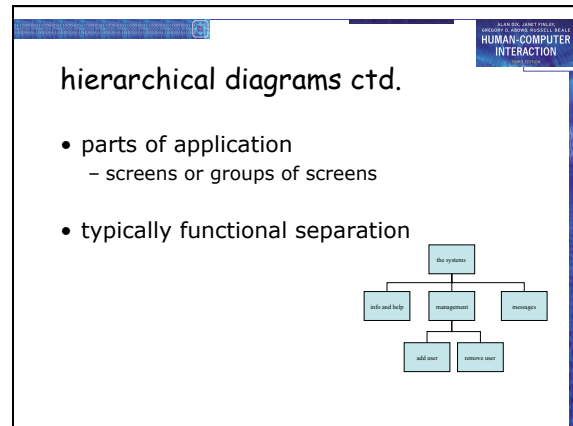
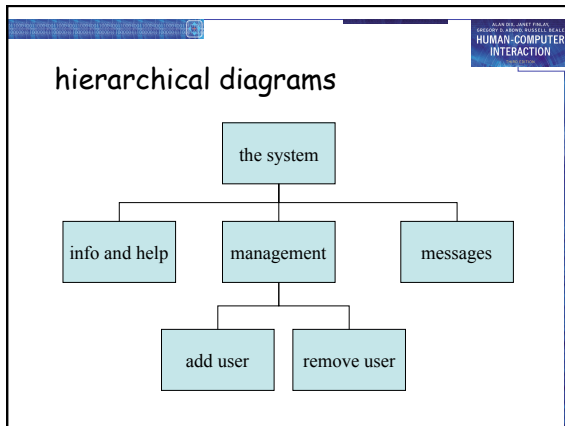
- where do they go?
 - lots of room for extra text!

modes

- lock to prevent accidental use ...
 - remove lock - 'c' + 'yes' to confirm
 - frequent practiced action
- if lock forgotten
 - in pocket 'yes' gets pressed
 - goes to phone book
 - in phone book ...
 - 'c' - delete entry
 - 'yes' - confirm
 - ... oops!

global

between screens
within the application



navigating hierarchies

- deep is difficult!
- misuse of Miller's 7 ± 2
 - short term memory, not menu size
- optimal?
 - many items on each screen
 - but structured within screen

see /e3/online/menu-breadth/

think about dialogue

what does it mean in UI design?

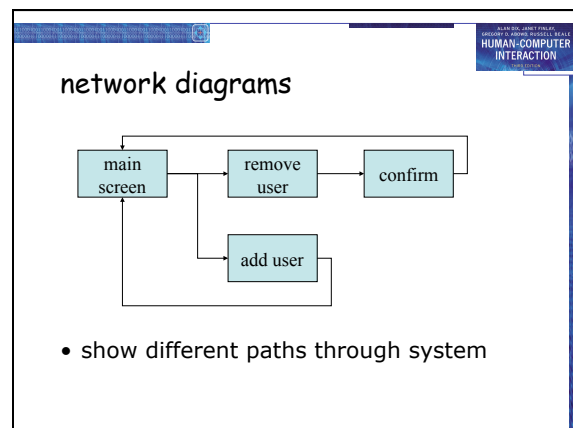
Minister: do you *name* take this woman ...
 Man: I do
 Minister: do you *name* take this man ...
 Woman: I do
 Minister: I now pronounce you man and wife

think about dialogue

what does it mean in UI design?

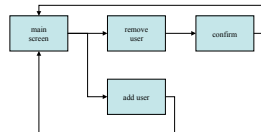
Minister: do you *name* take this woman ...

- marriage service
 - general flow, generic - blanks for names
 - pattern of interaction between people
- computer dialogue
 - pattern of interaction between users and system
 - but details differ each time



network diagrams ctd.

- what leads to what
- what happens when
- including branches
- more task oriented than hierarchy



wider still

between applications
and beyond ...

wider still ...

- style issues:
 - platform standards, consistency
- functional issues
 - cut and paste
- navigation issues
 - embedded applications
 - links to other apps ... the web

