Interaction Design Basics

Chapter 5

Interaction Design Basics

- *O* design:
  - *O* what it is?, goals, constraints
- *O* the design process
  - *O* what happens when
- *O* users
  - *O* who they are? what they are like?
- *O* scenarios
  - *O* rich stories of design
- *O* navigation
  - *O* finding your way around a system
- *O* repetition and prototypes

interactions and interventions

O design interactions not just interfaces

O designing interventions not just objects
   O   not just the system, but also …
      O   documentation, manuals, tutorials

what is design in HCI?

O It is a process:

  ➢ a goal-directed problem solving activity informed by intended use, target domain, materials, cost, and likelihood

  ➢ a creative activity

  ➢ a decision-making activity to balance trade-offs

O It is a representation:

  ➢ a plan for development

Interaction design model

Identify needs/
establish
requirements

(Re)Design

Evaluate

Build an
interactive
version

Final product

Interaction Design activities

O   There are four basic activities in Interaction Design:

1.   Identifying needs and creating requirements

2. Developing alternative designs

3. Building interactive versions of the designs like a prototype

4. Evaluating designs

Three Key Characteristics *of the*
four design interaction activities

O Three key characteristics permeate these four activities:

1. Focus on users early in the design and evaluation

2. Identify, document and agree specific usability and user experience goals

3. Repetition is expected. Designers never get it right first time

golden rule of design

understand your materials

for Human–Computer Interaction

understand your materials

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

Design Interaction Issues

1. Who are the users?

2. What are 'needs'?

3. Where do alternatives come from?

4. How do you choose among alternatives?

know your user

➢ who are they?

➢ talk to them

➢ watch them

➢ use your imagination

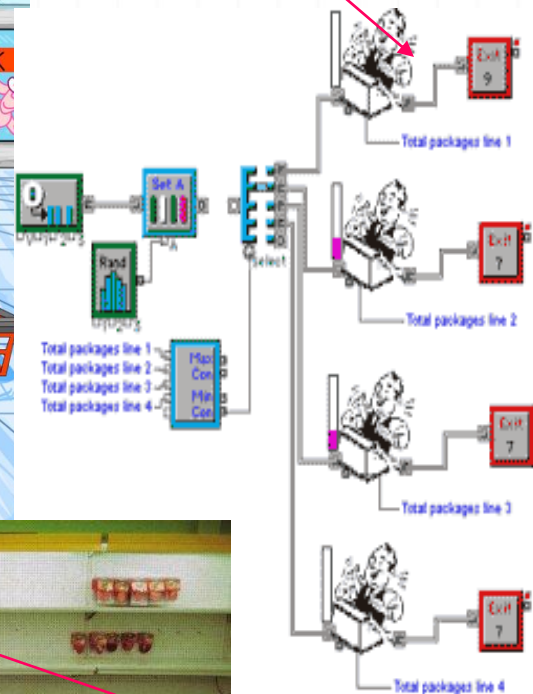# Who are the users/stakeholders?

O Not as obvious as you think:

1. those who interact directly with the product
2. those who manage direct users
3. those who receive output from the product
4. those who make the purchasing decision
5. those who use competitor's products

Who are the stakeholders?

- Suppliers
- Local shop owners

Check-out operators
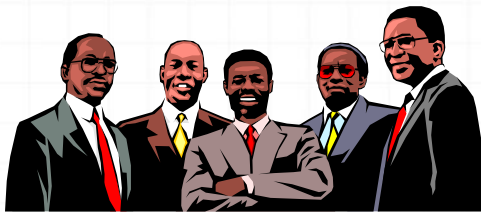
Customers

Managers and owners

What are user's needs?

O Users rarely know what is possible

O Users can't tell you what they 'need' to help them achieve their goals

O Instead, look at existing tasks:

1. their context, eg. background, situation, ...

2. what information do they require?

3. who collaborates to achieve the task?

4. why is the task achieved the way it is?

Where do alternatives come from?

O Humans stick to what they know works

O Designers are trained to consider alternatives,

O How do you generate alternatives?

1. 'Skill and creativity': research & creation

2. Seek inspiration: look at similar products or look at very different products
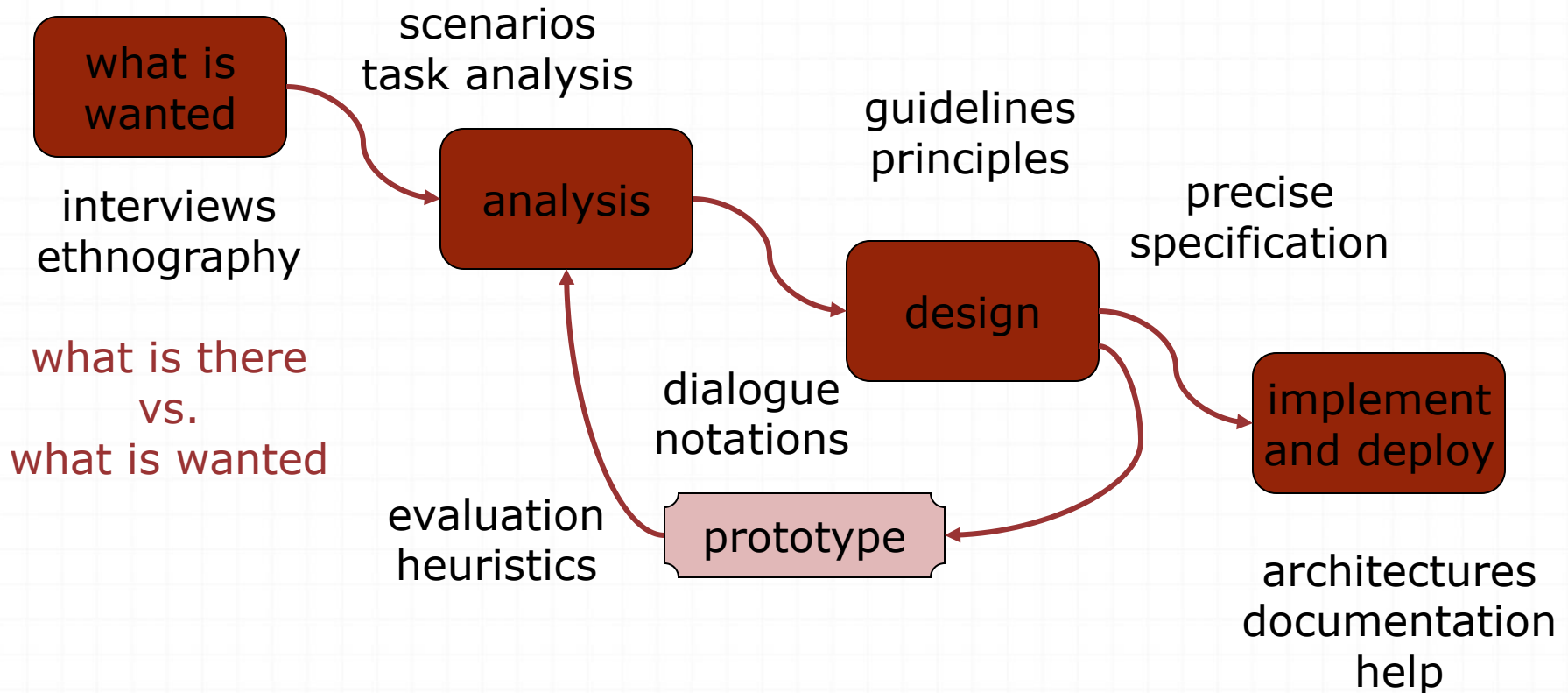
How do you choose among alternatives?

1. Evaluation with users or with peers e.g. prototypes

2. Technical feasibility

3. Quality thresholds: Usability goals lead to <u>usability criteria</u> (set early and checked regularly)

   —safety: how safe?

   —utility: which functions are superfluous?

   —effectiveness: appropriate support? task coverage, information available

   —efficiency: performance measurements

Process of Design

1. requirements
   - o what is there and what is wanted ...
2. analysis
   - o ordering and understanding
3. design
   - o what to do and how to decide
4. repetition and prototyping
   - o getting it right ... and finding what is really needed!
5. implementation and deployment
   - o making it and getting it out there

The process of design

what is wanted

scenarios
task analysis

interviews
ethnography

what is there
vs.
what is wanted

analysis

guidelines
principles

precise
specification

design

dialogue
notations

implement
and deploy

evaluation
heuristics

prototype

architectures
documentation
help

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

o limited time $\Rightarrow$ design trade-off

o usability?

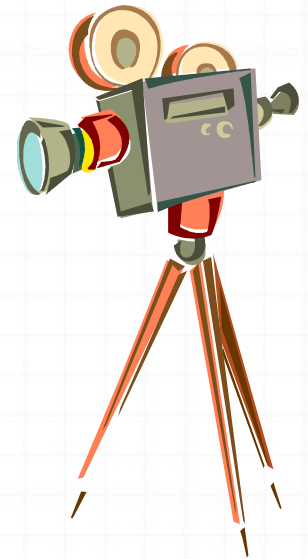 o finding problems and fixing them?
  o deciding what to fix?

o a perfect system is badly designed

  o too good $\Rightarrow$ too much effort in design

scenarios

- stories for design
  - communicate with others
  - validate other models
  - express dynamics

scenarios ...

O what will users want to do?

O step-by-step walkthrough
   O what can they see (sketches, screen shots)
   O what do they do (keyboard, mouse etc.)
   O what are they thinking?

O use and reuse throughout design

... explore the depths

○ explore interaction
   ○ what happens when

○ explore cognition
   ○ what are the users thinking

○ explore architecture
   ○ what is happening inside

use scenarios to ..(Scenarios Usage)

- communicate with others
  - designers, clients, users

- validate other models
  - 'play' it against other models

- express dynamics
  - screenshots – appearance
  - scenario – behaviour
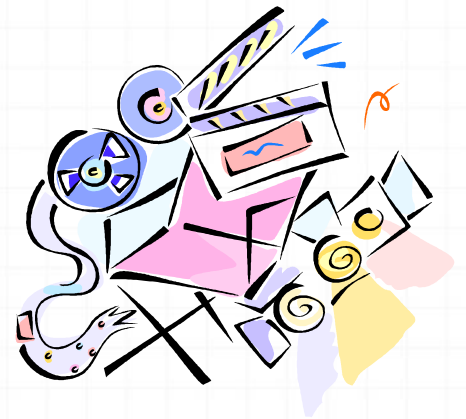
think about structure (Design Structure Types)

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

four golden rules

0 knowing where you are

0 knowing what you can do

0 knowing where you are going

  0 or what will happen

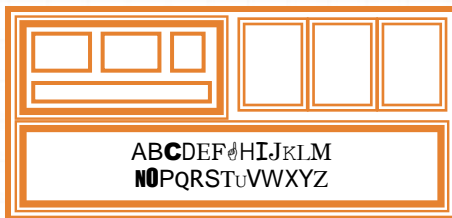*0* knowing where you've been

  0 or what you've done

Dix , Alan
Finlay, Janet
Abowd, Gregory
Beale, Russell
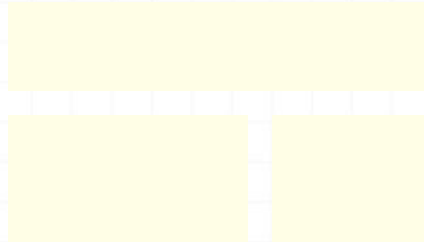
screen design and layout

basic principles
grouping, structure, order
alignment
use of white space

ABCDEFGHIJKLM
NOPQRSTUVWXYZ

basic principles of screen design and layout

o ask

    o what is the user doing?

o think

    o what information, comparisons, order

o design

    o form follows function

available tools of screen design and layout

O grouping of items

O order of items

O decoration - fonts, boxes etc.

O alignment of items

O white space between items

grouping and structure

logically together $\Rightarrow$ physically together

Billing details:
 Name
 Address: …
 Credit card no

Delivery details:
 Name
 Address: …
 Delivery time

Order details:

item	quantity	cost/item	cost
size 10 screws (boxes)	7	3.71	25.97
……	…	…	…

order of groups and items

O natural order
  - a,b,c…
  - 1, 2, 3, ….

O should match screen order!
  O use boxes, space etc.
  O set up tabbing right!

decoration

O use boxes to group logical items

O use fonts for emphasis, headings

O but not too many!!

ABC**D**EF☝HIJ KLM
NOPQRST U VWXYZ
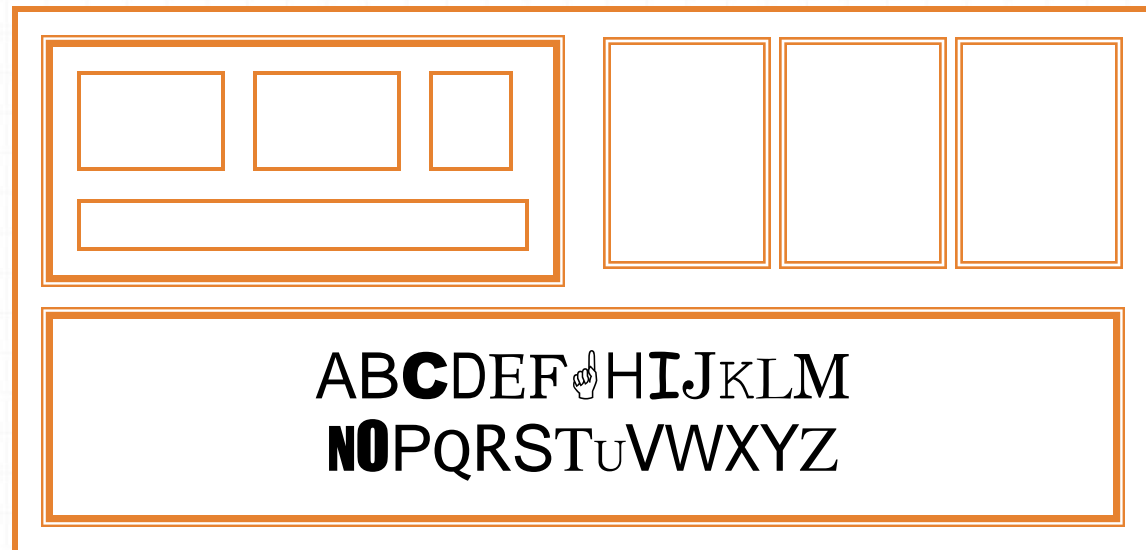
alignment - text

o you read from left to right (English)

$\Rightarrow$ align left hand side
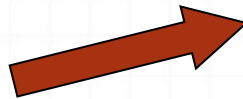
o You read from right to left (arabic)

$\Rightarrow$ align right hand side

boring but
readable!

Willy Wonka and the Chocolate Factory
Winston Churchill - A Biography
Wizard of Oz
Xena - Warrior Princess

Willy Wonka and the Chocolate Factory
Winston Churchill - A Biography
Wizard of Oz
Xena - Warrior Princess

fine for special effects
but hard to scan

multiple columns

0 scanning across gaps hard:

sherbert	75
toffee	120
chocolate	35
fruit gums	27
coconut dreams	85

multiple columns - 2

O use leaders

sherbert	75
toffee	120
chocolate	35
fruit gums	27
coconut dreams	85

multiple columns - 3

O or greying   (vertical too)

sherbert	75
toffee	120
chocolate	35
fruit gums	27
coconut dreams	85

multiple columns - 4

O or even (with care!) 'bad' alignment

sherbert	75
toffee	120
chocolate	35
fruit gums	27
coconut dreams	85

white space - the counter

WHAT YOU SEE

white space - the counter

WHAT YOU SEE

THE GAPS BETWEEN

- space to separate

- space to structure

A

B C D

E F
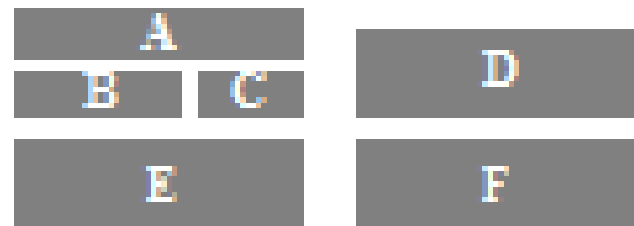
- Space to highlight

physical controls

O grouping of items

defrost settings

type of food

time to cook

physical controls

O grouping of items

O order of items

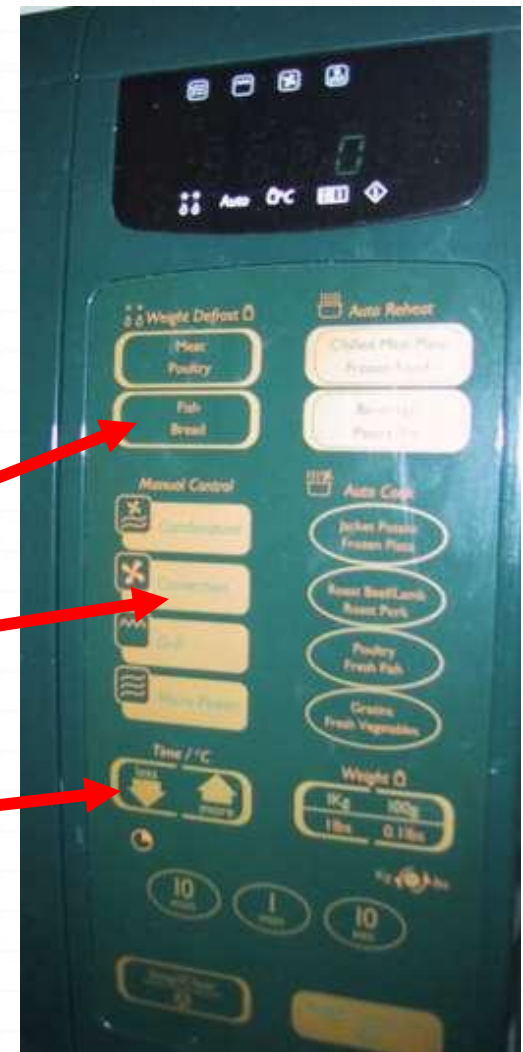 1) type of heating

  2) temperature

  3) time to cook

  4) start
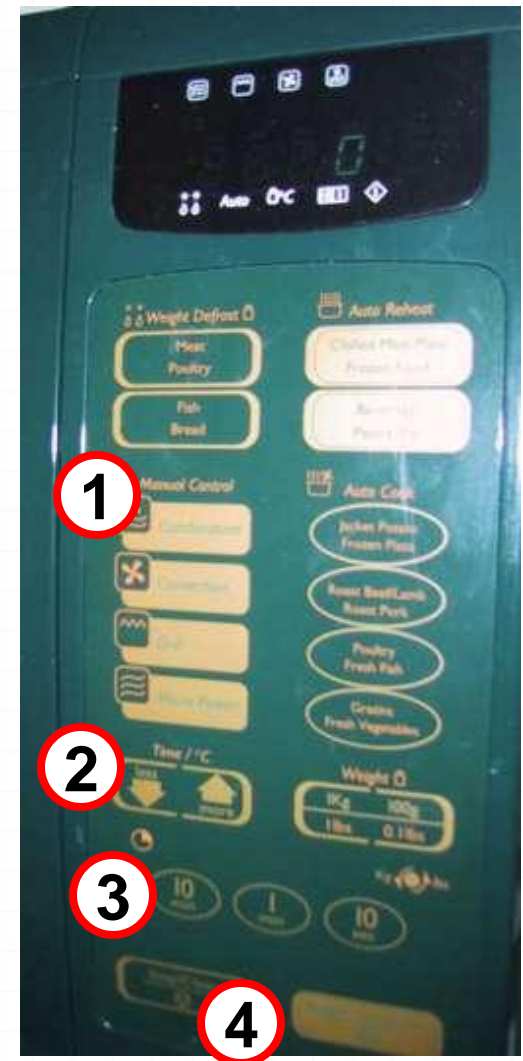
physical controls

O grouping of items

O order of items

O decoration

different colours for
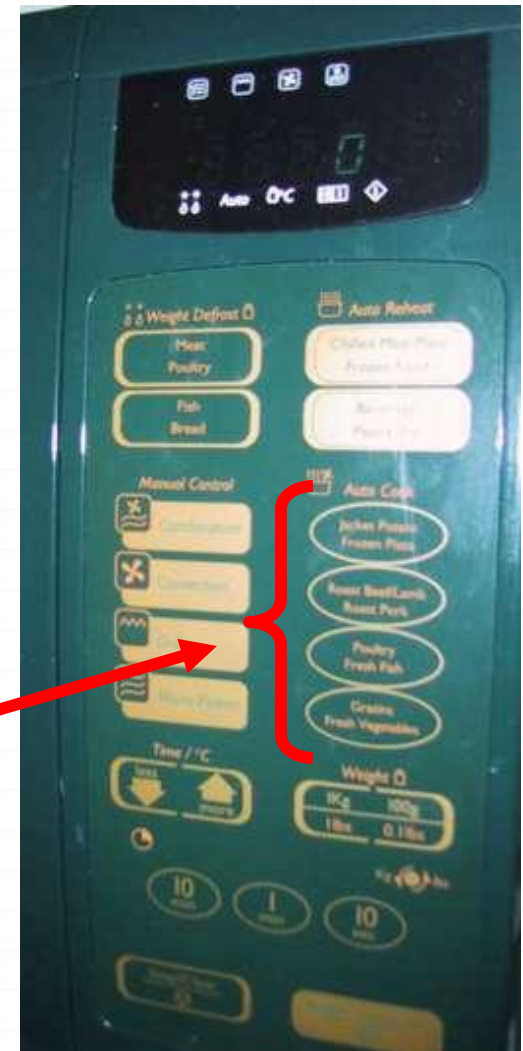different functions

lines around related
buttons (temp up/down)

physical controls

o grouping of items

o order of items

o decoration

o alignment

   centred text in buttons

   ? easy to scan ?

physical controls

- grouping of items

- order of items

- decoration

- alignment

- white space

gaps to aid grouping

user action and control

entering information

knowing what to do

affordances

entering information

- forms, dialogue boxes
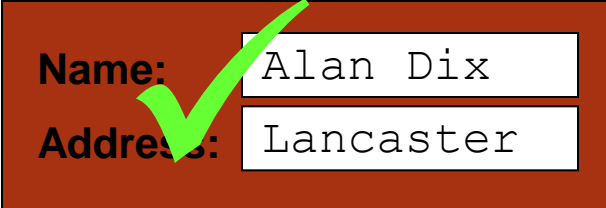   - presentation + data input
    - similar layout issues
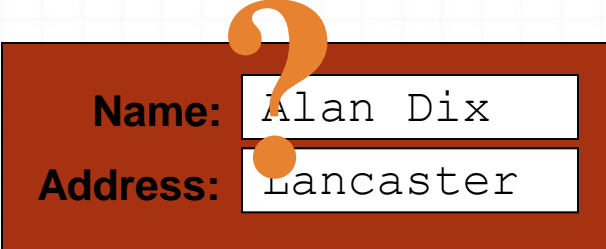   - Alignment

- logical layout
    - use task analysis
    - groupings
    - natural order for entering information
        - top-bottom, left-right (depending on culture)
        - set tab order for keyboard entry

Name: Alan Dix
Address: Lancaster

Name: Alan Dix
Address: Lancaster

Name: Alan Dix
Address: Lancaster

N.B. see extra slides for widget choice

knowing what to do

- *O* what is active what is passive
  - *O* where do you click
  - *O* where do you type
- *O* consistent style helps
  - *O* e.g. web [underlined links](#)
- *O* labels and icons
  - *O* standards for common actions
  - *O* language – bold = current state or action

affordances

mug handle

'affords' grasping

- Definition: visual clue to a function of an object
- Examples:
  - for physical objects
    - shape and size suggest actions
      - pick up, twist, throw
    - also cultural – buttons 'afford' pushing
  - for screen objects
    - button–like object 'affords' mouse click
  - culture of computer use
    - icons 'afford' clicking
    - or even double clicking … not like real buttons!

appropriate appearance

presenting information

aesthetics and utility

colour and 3D

localisation & internationalisation

presenting information

O purpose matters
- O sort order (which column, numeric alphabetic)
- O text vs. diagram

O use paper presentation principles!

O but add interactivity
- O softens design choices
  - O e.g. re-ordering columns

| name	size
chap10	12
chap5	16
chap1	17
chap14	22
chap20	27
chap8	32
…	…

aesthetics and utility

- beautifully pleasing designs
  - increase user satisfaction and improve productivity
- beauty and utility may conflict
  - mixed up visual styles $\Rightarrow$ easy to distinguish
  - clean design – little differentiation $\Rightarrow$ confusing
  - backgrounds behind text
    - ...good to look at, but hard to read
- but can work together

colour and 3D

o both often used very badly!

o colour

    o older monitors limited palette

    o colour over used because 'it is there'

    o beware colour blind!

    o use carefully to emphasize other information

o 3D effects

    o good for physical information and some graphs

    o but if over used …

        e.g. text in perspective!! 3D pie charts
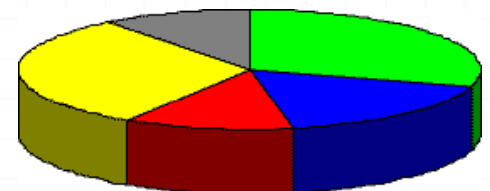
bad use of colour

- over use - without very good reason (e.g. kids' site)
- colour blindness
- poor use of contrast
- do adjust your set!
  - adjust your monitor to greys only
  - can you still read your screen?

across countries and cultures

O localisation & internationalisation
  O changing interfaces for particular cultures/languages
O globalisation
  O try to choose symbols etc. that work everywhere

O simply change language?
  O use 'resource' database instead of literal text
    ... but changes sizes, left-right order etc.
O deeper issues
  O cultural assumptions and values
  O meanings of symbols
    e.g +ve and -ve in some cultures
      ... but ... mean the same thing (mark this) in others

✔ ✘

repetition and prototyping

getting better ...

... and starting well

prototyping

O Definition: demonstration of the final production design

O you never get it right first time

O if at first you don't succeed ...