The process of interaction design
Overview

• What is involved in Interaction Design?
  – Importance of involving users
  – Degrees of user involvement
  – What is a user-centered approach?
  – Four basic activities

• Some practical issues
  – Who are the users? What are ‘needs’? Where do alternatives come from? How do you choose among alternatives?

• A simple lifecycle model for Interaction Design
• Lifecycle models from software engineering
• Lifecycle models from HCI
What is involved in Interaction Design?

• It is a process:
  – a goal-directed problem solving activity informed by intended use, target domain, materials, cost, and feasibility
  – a creative activity
  – a decision-making activity to balance trade-offs

• It is a representation:
  – a plan for development
  – a set of alternatives and successive elaborations
Importance of involving users

- **Expectation management**
  - Realistic expectations
  - No surprises, no disappointments
  - Timely training
  - Communication, but no hype

- **Ownership**
  - Make the users active stakeholders
  - More likely to forgive or accept problems
  - Can make a big difference to acceptance and success of product
Degrees of user involvement

• Member of the design team
  – Full time: constant input, but lose touch with users
  – Part time: patchy input, and very stressful
  – Short term: inconsistent across project life
  – Long term: consistent, but lose touch with users

• Newsletters and other dissemination devices
  – Reach wider selection of users
  – Need communication both ways

• Combination of these approaches
What is a user-centered approach?

User-centered approach is based on:

- Early focus on users and tasks: directly studying cognitive, behavioral, anthropomorphic & attitudinal characteristics
- Empirical measurement: users’ reactions and performance to scenarios, manuals, simulations & prototypes are observed, recorded and analysed
- Iterative design: when problems are found in user testing, fix them and carry out more tests
There are four basic activities in Interaction Design:

1. Identifying needs and establishing requirements
2. Developing alternative designs
3. Building interactive versions of the designs
4. Evaluating designs
Some practical issues

- Who are the users?
- What are ‘needs’?
- Where do alternatives come from?
- How do you choose among alternatives?
Who are the users/stakeholders?

• Not as obvious as you think:
  – those who interact directly with the product
  – those who manage direct users
  – those who receive output from the product
  – those who make the purchasing decision
  – those who use competitor’s products

• Three categories of user (Eason, 1987):
  – **primary**: frequent hands-on
  – **secondary**: occasional or via someone else
  – **tertiary**: affected by its introduction, or will influence its purchase
Who are the stakeholders?

- Suppliers
- Local shop owners
- Check-out operators
- Managers and owners
- Customers
What are the users’ capabilities?

Humans vary in many dimensions:

— size of hands may affect the size and positioning of input buttons
— motor abilities may affect the suitability of certain input and output devices
— height if designing a physical kiosk
— strength - a child’s toy requires little strength to operate, but greater strength to change batteries
— disabilities (e.g. sight, hearing, dexterity)
What are ‘needs’?

• Users rarely know what is possible
• Users can’t always tell you what they ‘need’ to help them achieve their goals
• Instead, look at existing tasks:
  – their context
  – what information do they require?
  – who collaborates to achieve the task?
  – why is the task achieved the way it is?
• Envisioned tasks:
  – can be rooted in existing behaviour
  – can be described as future scenarios
Where do alternatives come from?

- Humans stick to what they know works
- But considering alternatives is important to ‘break out of the box’
- Designers are trained to consider alternatives, software people generally are not
- How do you generate alternatives?
  - ‘Flair and creativity’: research and synthesis
  - Seek inspiration: look at similar products or look at very different products
IDEO TechBox

- Library, database, website - all-in-one
- Contains physical gizmos for inspiration

From: www.ideo.com/
The TechBox

04._ Each drawer resembles a bento box
05._ The curator keeps order
06._ All the entries are tagged
07._ It really is used daily
08._ Two demonstrations units on top
How do you choose among alternatives?

- Evaluation with users or with peers, e.g. prototypes
- Technical feasibility: some ideas not possible
- Quality thresholds: Usability goals lead to usability criteria set early on and checked regularly
  - safety: how safe?
  - utility: which functions are superfluous?
  - effectiveness: appropriate support? task coverage, information available
  - efficiency: performance measurements
Testing prototypes to choose among alternatives
Lifecycle models

• Show how activities are related to each other
• Lifecycle models are:
  — management tools
  — simplified versions of reality
• Many lifecycle models exist, for example:
  — from software engineering: waterfall, spiral, JAD/RAD, Microsoft, agile
  — from HCI: Star, usability engineering

• More on this in Software Engineering course
A simple interaction design model

Exemplifies a user-centered design approach
The Star lifecycle model

• Suggested by Hartson and Hix (1989)

• Important features:
  — Evaluation at the center of activities
  — No particular ordering of activities; development may start in any one
  — Derived from empirical studies of interface designers
The Star Model  (Hartson and Hix, 1989)
Usability engineering lifecycle model

• Reported by Deborah Mayhew

• Important features:
  – Holistic view of usability engineering
  – Provides links to software engineering approaches, e.g. OOSE
  – Stages of identifying requirements, designing, evaluating, prototyping
  – Can be scaled down for small projects
  – Uses a style guide to capture a set of usability goals
ISO 13407

1. Identify need for human-centred design
2. Understand and specify the context of use
3. System satisfies specified user and organizational requirements
4. Evaluate designs against requirements
5. Specify the user and organizational requirements
6. Produce design solutions
Summary

Four basic activities in the design process
1. Identify needs and establish requirements
2. Design potential solutions ((re)-design)
3. Choose between alternatives (evaluate)
4. Build the artefact

User-centered design rests on three principles
1. Early focus on users and tasks
2. Empirical measurement using quantifiable & measurable usability criteria
3. Iterative design

Lifecycle models show how these are related