The process of interaction design

Overview

• What is involved in Interaction Design?
  - Importance of involving users
  - Degree 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
Four basic activities

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 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

How do you choose among alternatives?

- Evaluation with users or with peers, e.g. prototypes
- Technical feasibility: some not possible
- Quality thresholds: Usability goals lead to usability criteria set early on and check 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
A simple interaction design model

Exemplifies a user-centered design approach

Traditional ‘waterfall’ lifecycle

Spiral model (Barry Boehm)

Important features:
— Risk analysis
— Prototyping
— Iterative framework so ideas can be checked and evaluated
— Explicitly encourages considering alternatives

Good for large and complex projects but not simple ones

Spiral Lifecycle model

A Lifecycle for RAD (Rapid Applications Development)

DSDM lifecycle model
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

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