

# User Interface Design

## Lecture 3: The Process of Interaction Design

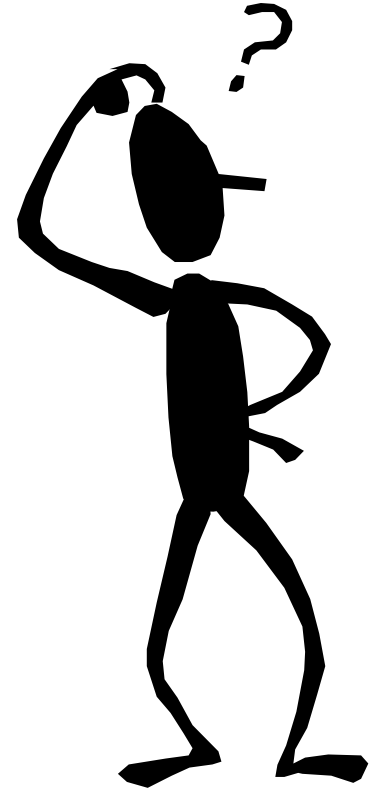
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# Learning Objectives

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- ▶ 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 to choose among alternatives?
  - ▶ How to integrate interaction design activities in other lifecycle models?



# What is involved in Interaction Design?

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- ▶ 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
- ▶ Generating alternatives and choosing between them is key
- ▶ Four approaches: user-centered design, activity-centered design, systems design, and genius design

# Importance of involving users

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- ▶ **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

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- ▶ 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
- ▶ User involvement after product is released
- ▶ Combination of these approaches

# What is a user-centered approach?

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- ▶ 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 in Interaction Design

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1. Establishing requirements
2. Designing alternatives
3. Prototyping
4. Evaluating

# A simple interaction design lifecycle model

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Exemplifies a user-centered design approach

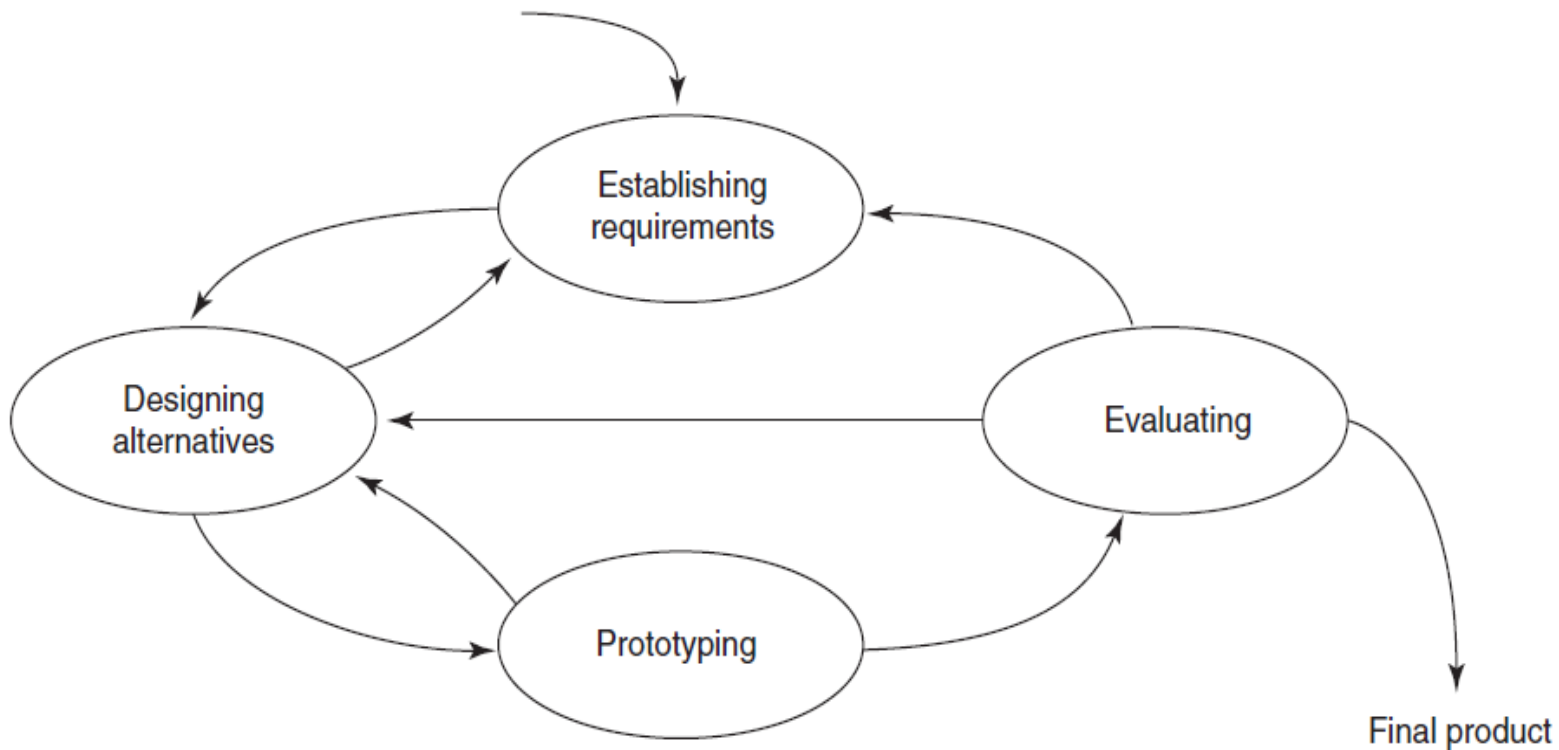


Figure 9.3 A simple interaction design lifecycle model



# Some practical issues

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- ▶ Who are the users?
- ▶ What do we mean by ‘needs’ ?
- ▶ How to generate alternatives
- ▶ How to choose among alternatives
- ▶ How to integrate interaction design activities with other lifecycle models?

# Who are the users/stakeholders?

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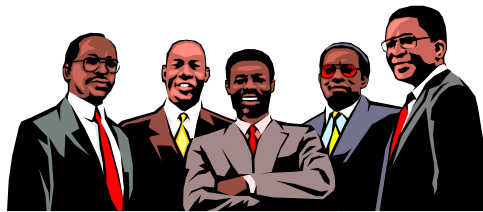
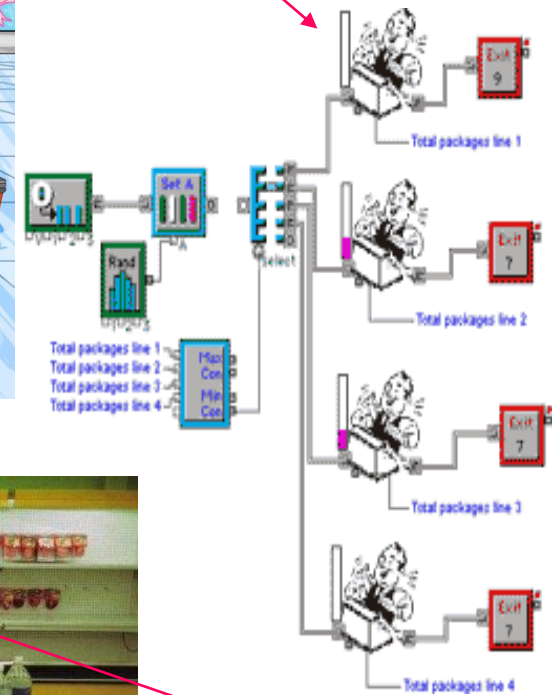
- ▶ Not as obvious as you think:
  - ▶ those who interact directly with the product
  - ▶ those who manage direct users
  - ▶ those who receive output from the product
  - ▶ those who make the purchasing decision
  - ▶ those who use competitor's products
- ▶ Three categories of user (Eason, 1987):
  - ▶ 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 do we mean by ‘needs’ ?

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- 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

# How to generate alternatives

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- ▶ 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

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



01\_

The Tech Box is centrally located



02\_

An item on the intranet website



03\_

The drawers are sorted by categories

# The TechBox

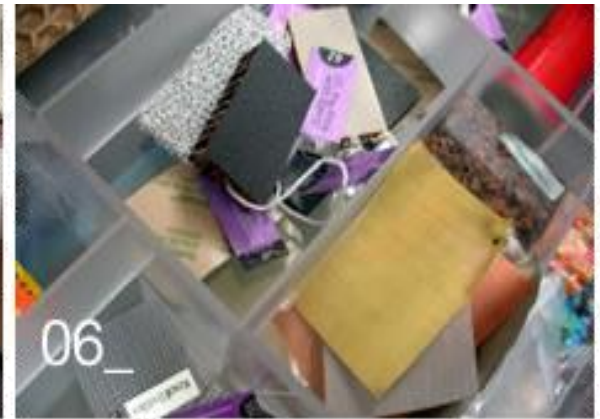
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Each drawer resembles a bento box



The curator keeps order



All the entries are tagged



It really is used daily



Two demonstrations units on top

# How to choose among alternatives

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- ▶ 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



# How to choose among alternatives

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- ▶ efficiency: performance measurements
- ▶ learnability: is the time taken to learn a function acceptable to the users?
- ▶ memorability: can infrequent users remember how to achieve their goal?

# Testing prototypes to choose among alternatives

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# How to integrate interaction design in other models

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- ▶ Integrating interaction design activities in lifecycle models from other disciplines needs careful planning
- ▶ Several software engineering lifecycle models have been considered
- ▶ Integrating with agile software development is promising
  - ▶ it stresses the importance of iteration
  - ▶ it champions early and regular feedback
  - ▶ it handles emergent requirements
  - ▶ it aims to strike a balance between flexibility and structure

# Summary

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- ▶ Four basic activities in the design process
  - ▶ Establishing requirements
  - ▶ Designing alternatives
  - ▶ Prototyping
  - ▶ Evaluating
  
- ▶ User-centered design rests on three principles
  - ▶ Early focus on users and tasks
  - ▶ Empirical measurement using quantifiable & measurable usability criteria
  - ▶ Iterative design