The process of interaction design

Lecture 4

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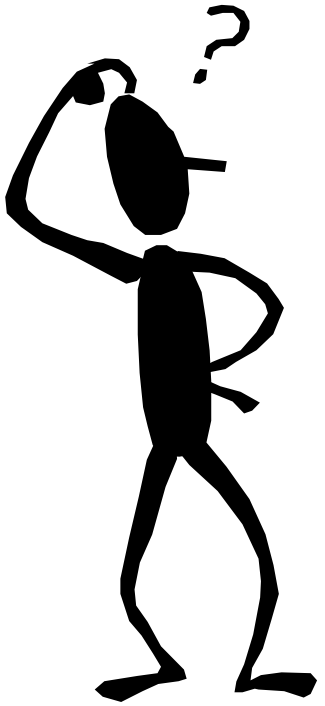
Overview

- 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?
- HCI lifecycle models and integration with another models



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
- Four approaches:
  - user-centered design,
  - activity-centered design,
  - systems design, and
  - genius design

Design approaches

1. User centered design
   - The user knows best what he needs and he is the designer's source of knowledge
   - The role of the designer – translate users' needs and goals to the design decisions
2. Activity-centred design
   - Highlights the activities surrounding the task
   - The user is still important but more the activities are analysed instead of needs and objectives

Design approaches

- System design
  - A structured, rigorous and holistic design approach
  - Highlights a context
  - appropriate for complex systems
- Rapid expert design (genius design)
  - Based on the experience of a designer
  - User's role – to evaluate the designer's ideas
    - the user is not involved to a design process itself

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
- User involvement after product is released
- 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, behavioural, 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

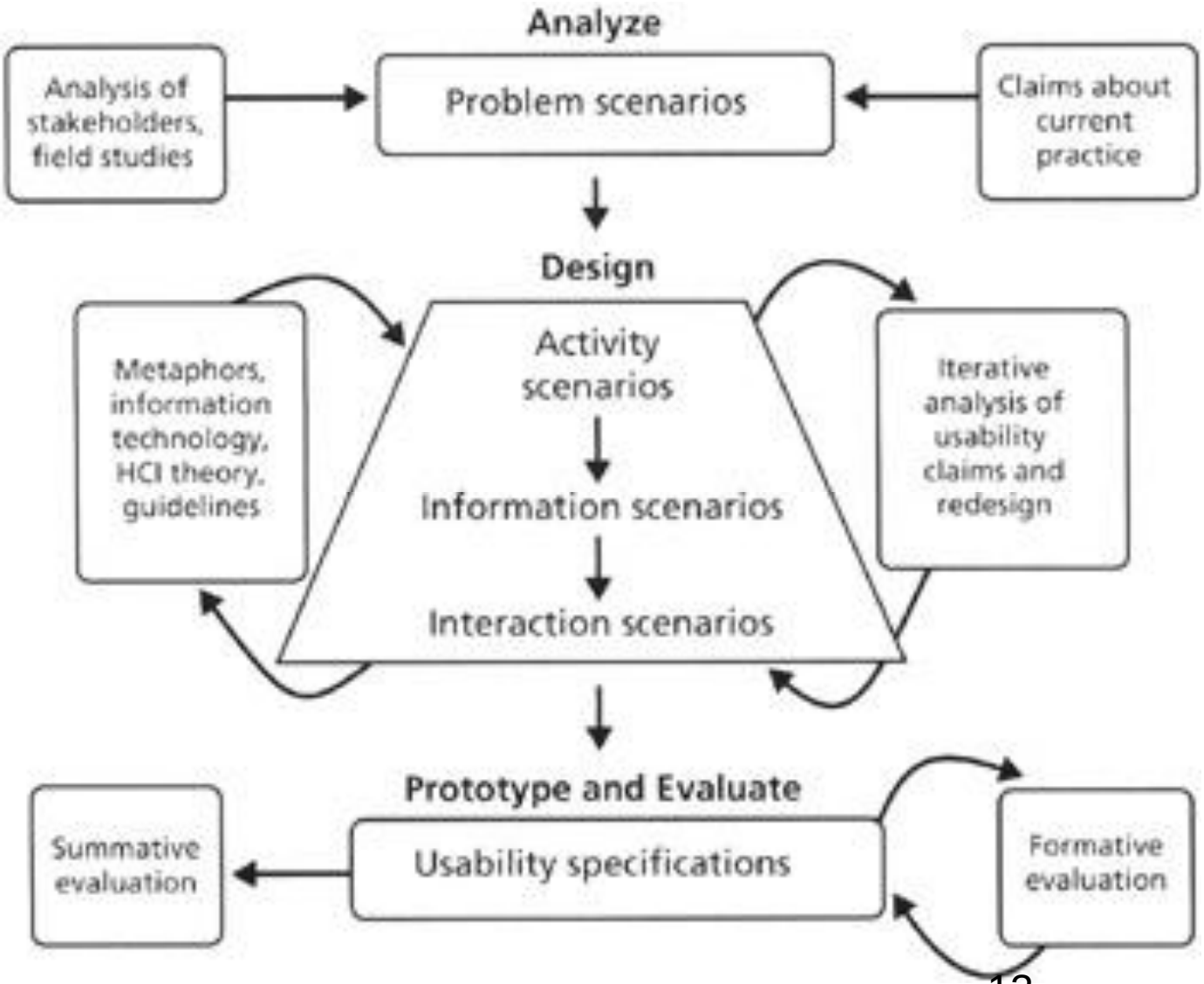
Focusing on users and their tasks

- User goals and tasks - the driving force for the project
- The aim is to satisfy users' tasks and the context of usage
- Design according to user characteristics
- Users’ involvement throughout the project and their views are taken seriously
- All design decisions are made taking into account the users, their tasks and the use of context.

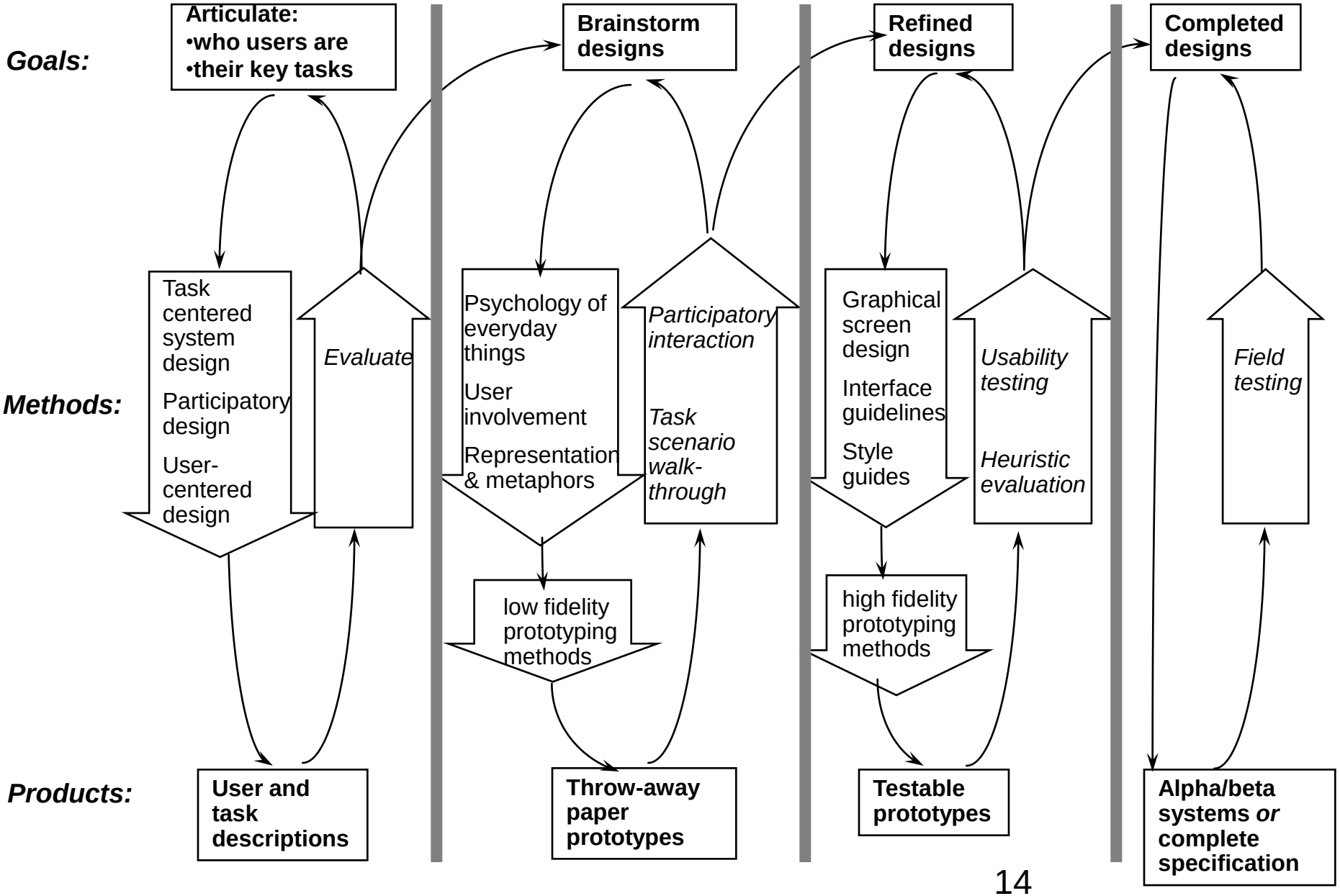
Four basic activities in Interaction Design

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

Scenario-based usability engineering [Rosson, Carroll]



Usability engineering (Soul Greenberg)



User characteristics

- Hand size influences the size of the input buttons and layout
- Movement abilities are important when choosing the input and output devices
- Height is important in designing an information kiosk
- Strength - children's toys should be sufficient to manage a weak power but replace the batteries should require more strength
- Disability (e.g. sight, hearing, dexterity) affects the availability of the product properties.

Some practical issues

- 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 models?

Who are the users/stakeholders?

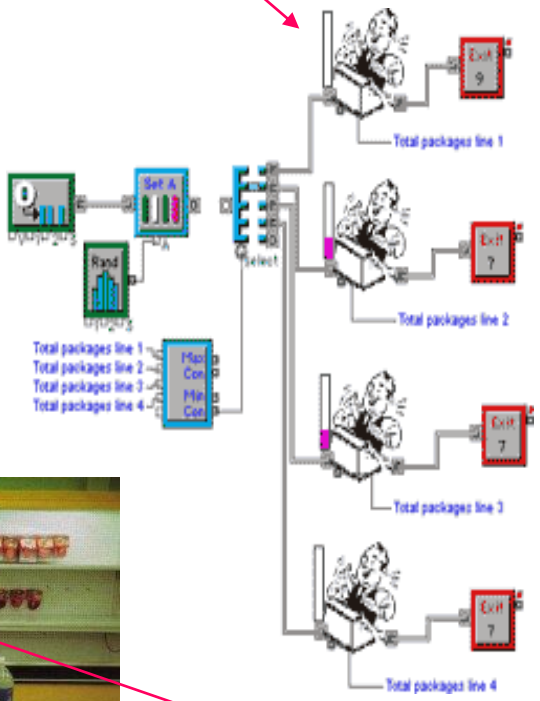
- Not as obvious as you think:
  - those who interact directly with the product
  - those who manage direct users
  - those who receive output from the product
  - those who make the purchasing decision
  - those who use competitor's products

- 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 do we mean by '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

User needs

How to balance human control and automation?

Usability and experience goals

Prototypes showing essential functionality

Usage scenarios

How to generate alternatives

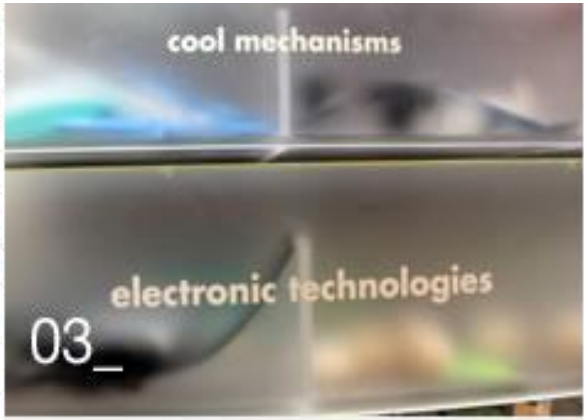
- Humans stick to what they know works
- But considering alternatives is important to 'break out of the box'
- Designers are trained to consider alternatives, software people generally are not
- How do you generate alternatives?
  - —'Flair and creativity': research and synthesis
  - —Seek inspiration: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

IDEO TechBox

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

The Tech Box is centrally located

An item on the intranet website



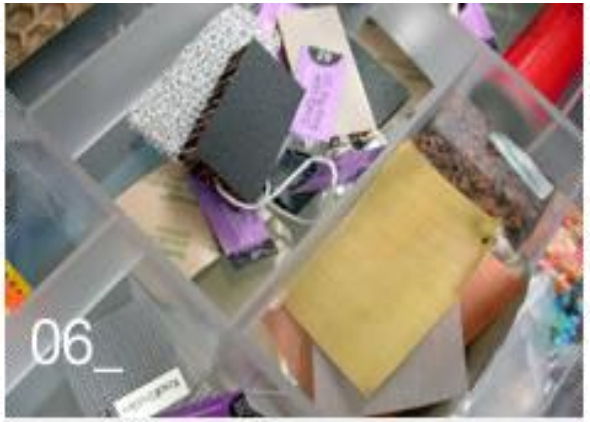
The drawers are sorted by categories

From: www.ideo.com/

The TechBox

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

- 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

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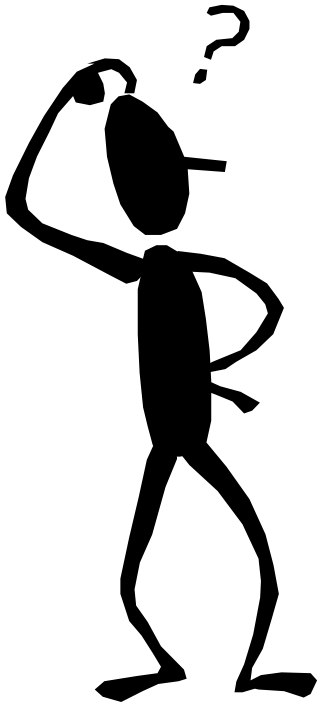
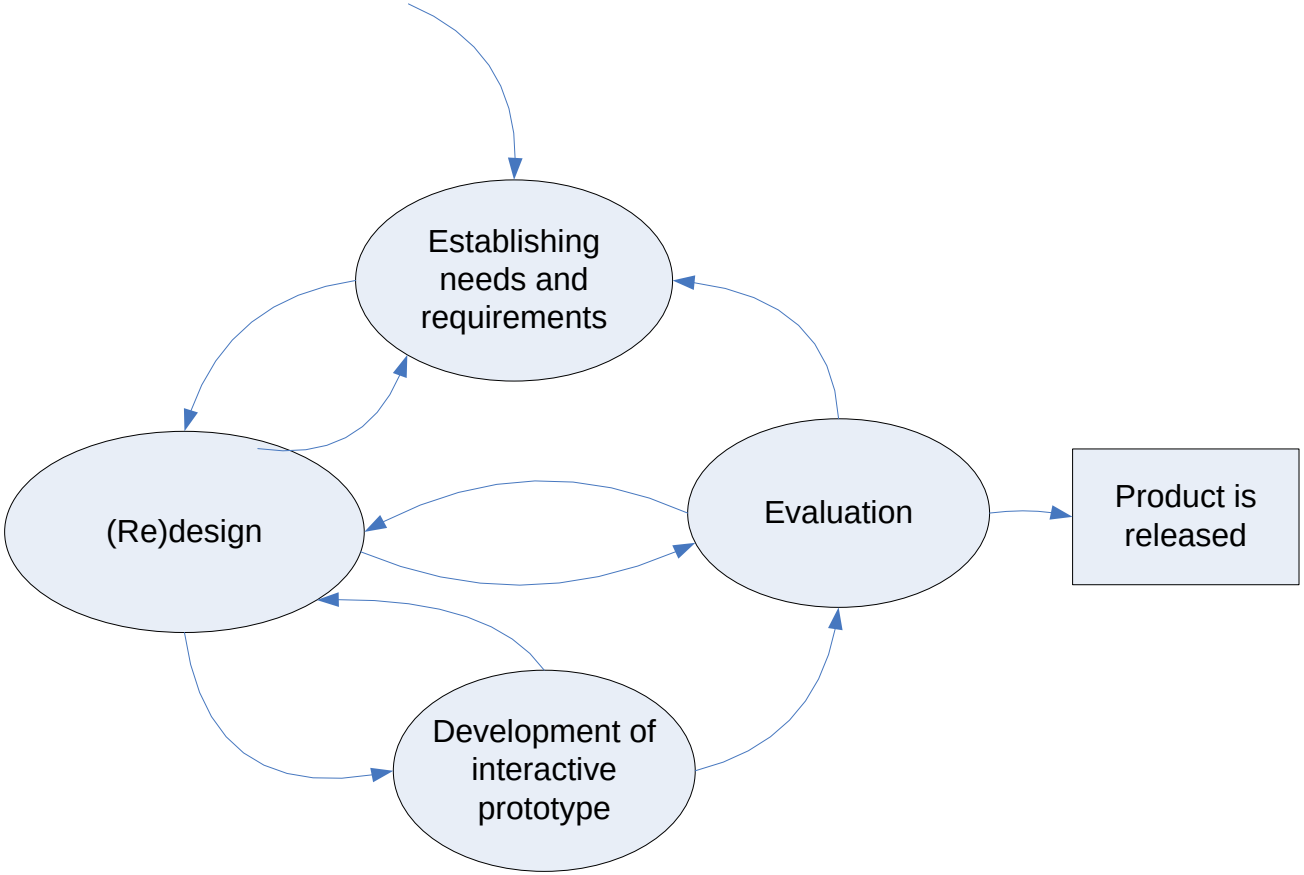
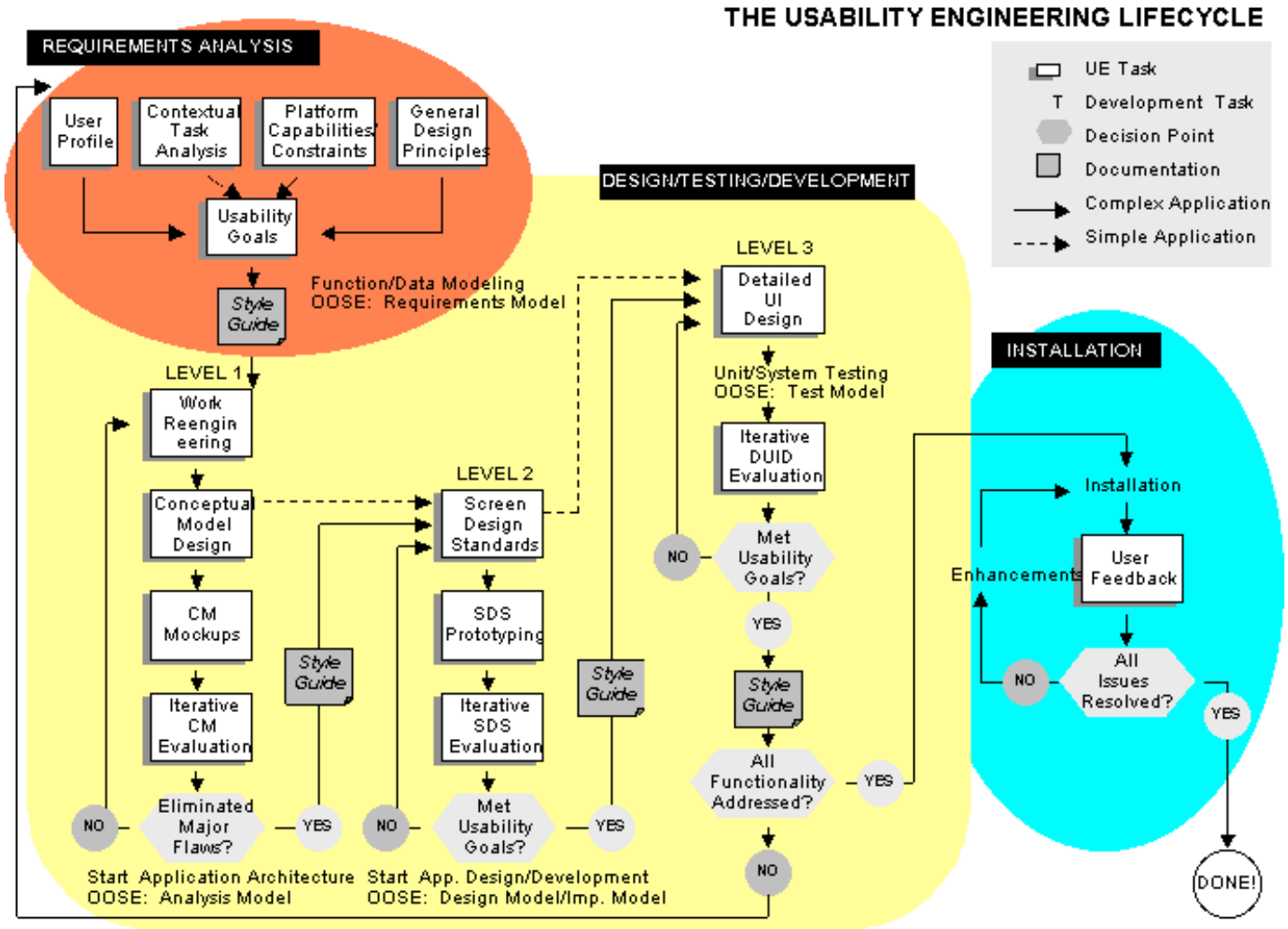


A simple interaction design lifecycle model



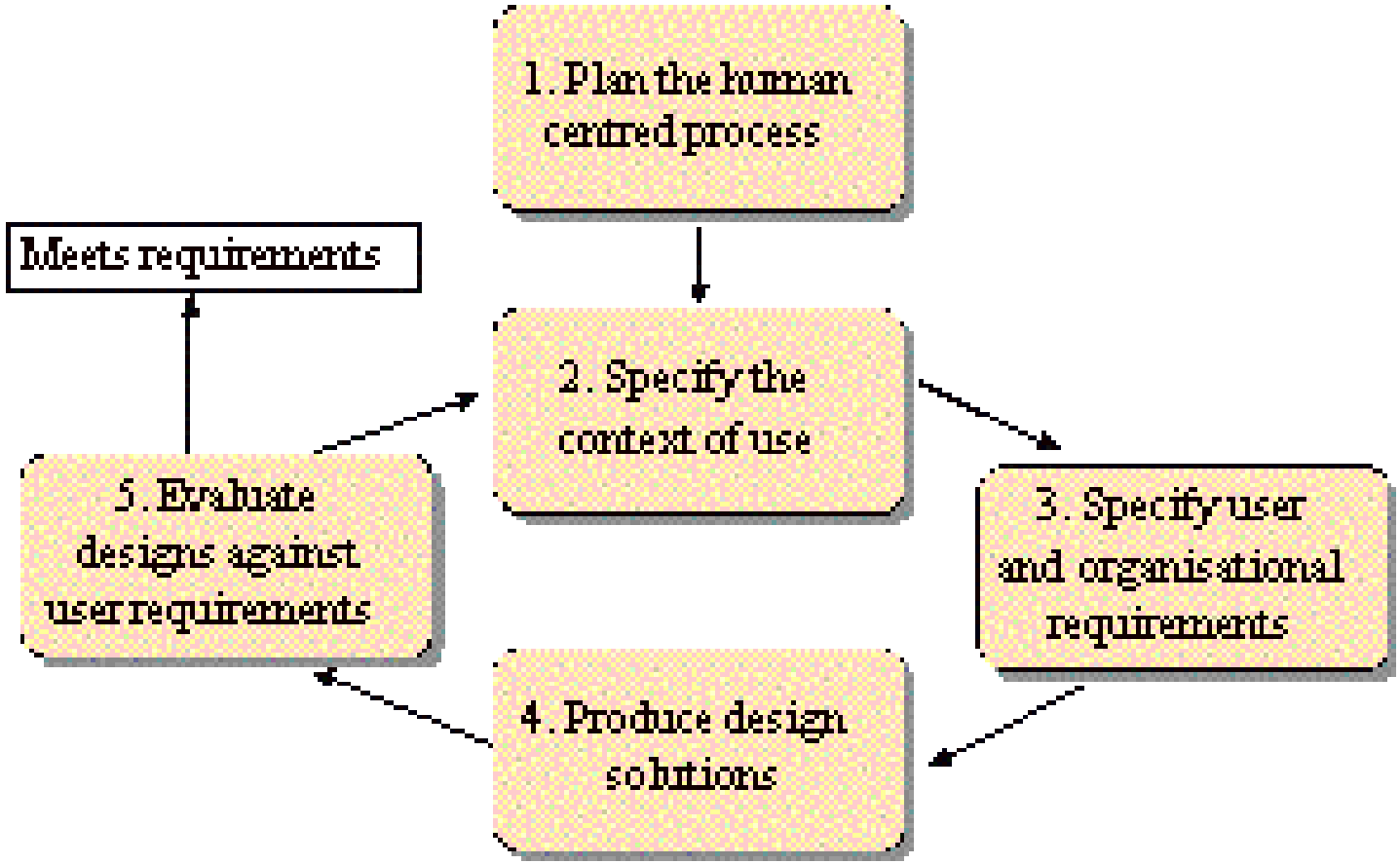
Exemplifies a user-centered design approach

The usability engineering lifecycle



(D. Deborah J. Mayhew & Associates 2011

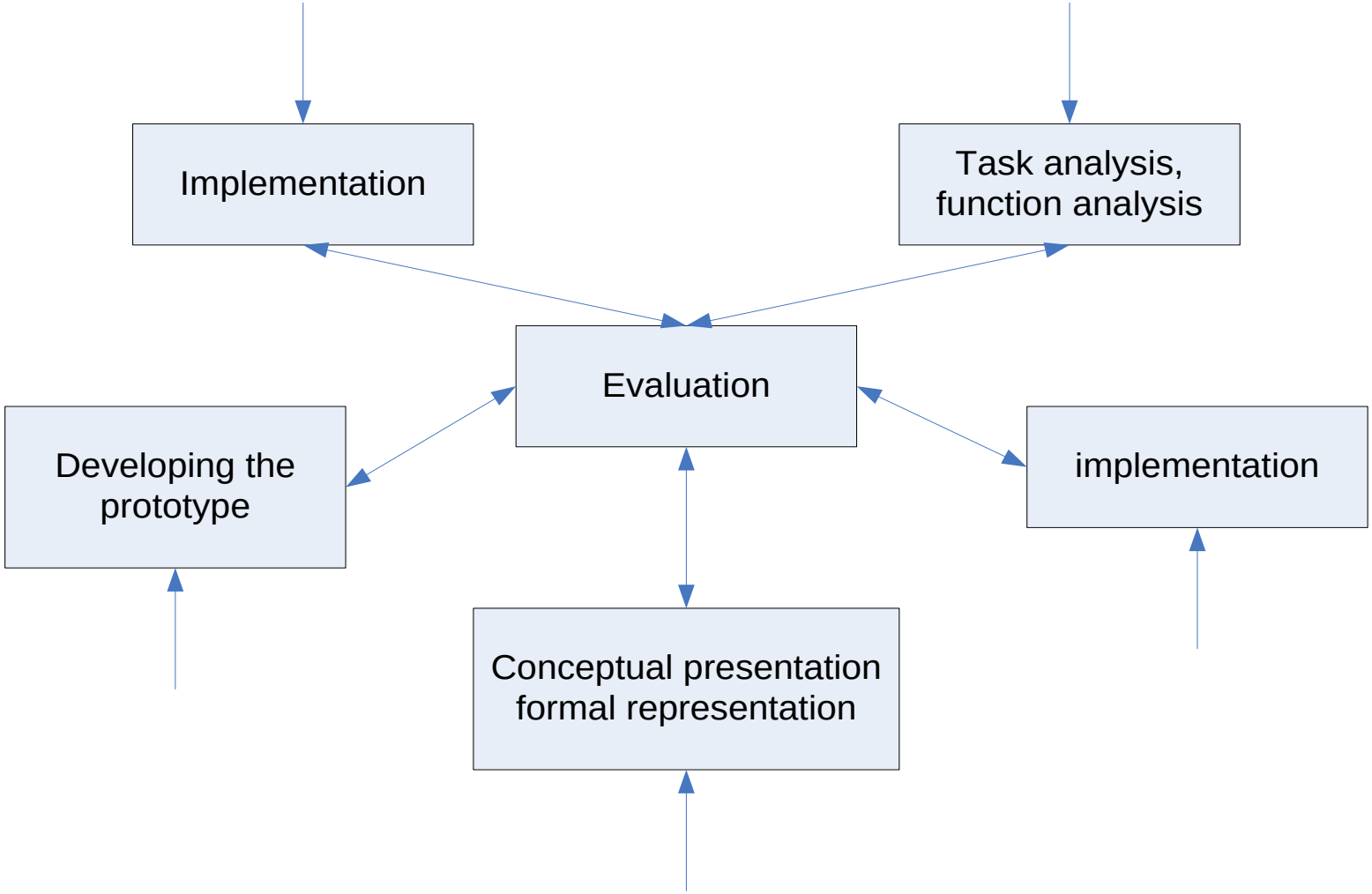
ISO 13407 Human centred design processes for interactive systems



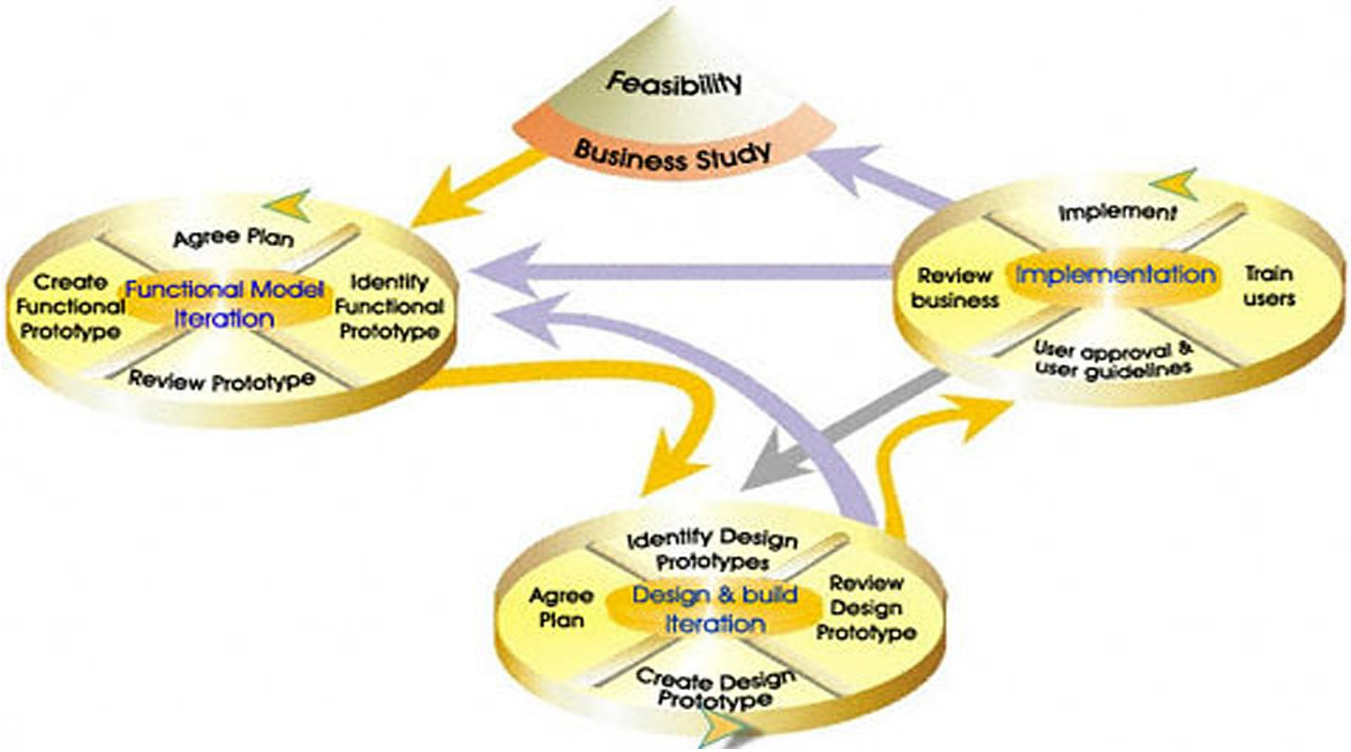
ISO 13407 from Usability Net

Star model

(Hartson ir Hix, 1989)



DSDM lifecycle model



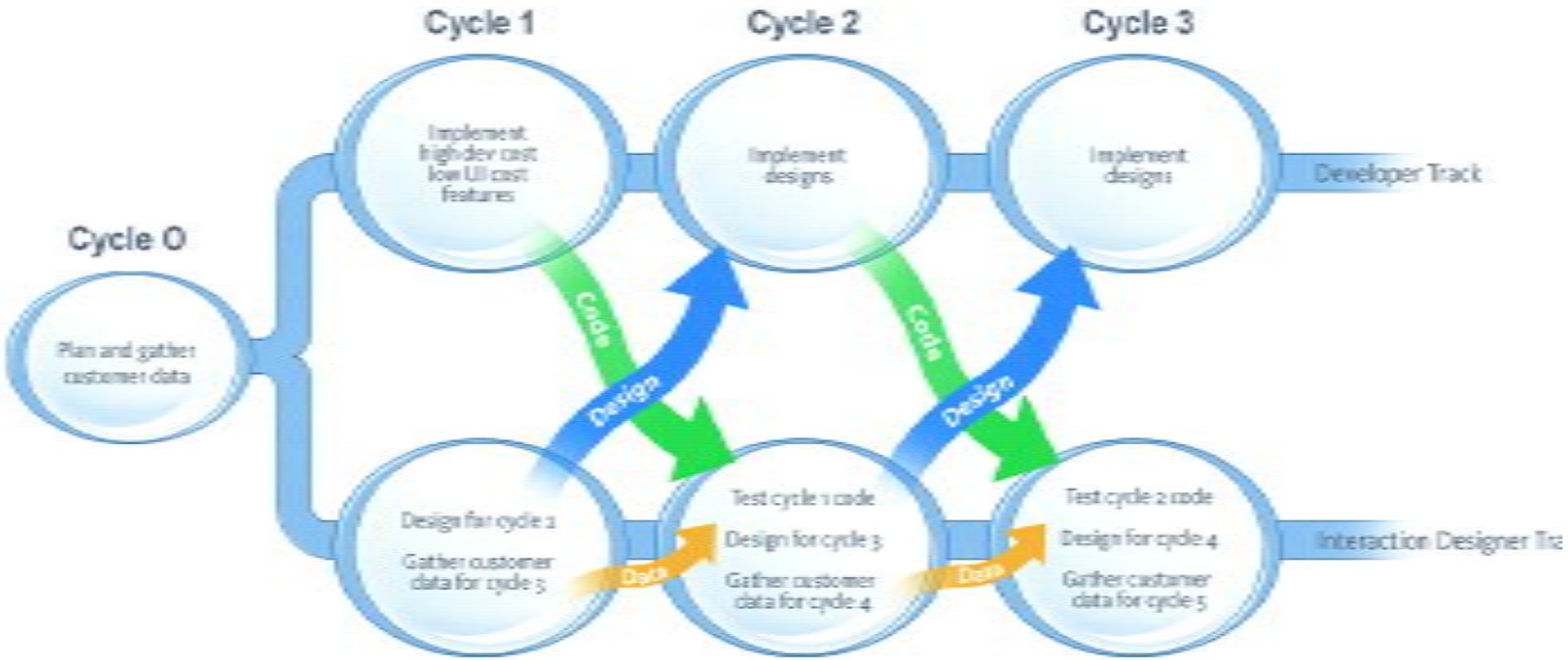
http://na.dsdm.org/en/about/lifecycle.asp

UCD and Agile integration

- SketchBook Pro (Alias, Canada)
- ID techniques
  - context research
  - interview
  - usability tests
  - surveys and beta-tests
- Agile process: Scrum
  - Challenge: ID processes intersect with Agile ones

http://agileproductdesign.com/useful_papers/miller_customer_input_in_agile_projects.pdf

Solution: Agile + UCD, Alias



http://dux.typepad.com/files/sy_agile-ucd.pdf

Summary

Four basic activities in the design process

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

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

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- Applications
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