

The process of interaction design



Overview

- What is interaction design ?
 - Four basic activities
 - Three key characteristics
- Some practical issues
 - Who are the users ?
 - What are the needs ?
 - Where do alternatives come from ?
 - How do you choose among alternatives ?
- Lifecycle models from Software Engineering
- Lifecycle models from HCI

What is Interaction Design ?

- It is a process
 - Goal-directed problem-solving activity informed by intended use, target domain, materials, cost, and feasibility
 - A creative activity
 - A decision-making activity to balance tradeoffs
- It is a representation
 - Plan for development
 - Set of alternatives and successive elaborations

Four basic activities

- Identifying needs and establishing requirements
- Developing alternative designs
- Building interactive versions of the designs
- Evaluating designs

Three key characteristics

- Three key characteristics permeate these four activities
 - Focus on users early in the design and evaluation of the artefact
 - Identify, document and agree specific usability and user experience goals
 - Iteration is inevitable. Designers never get it right the first time

Some practical issues

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

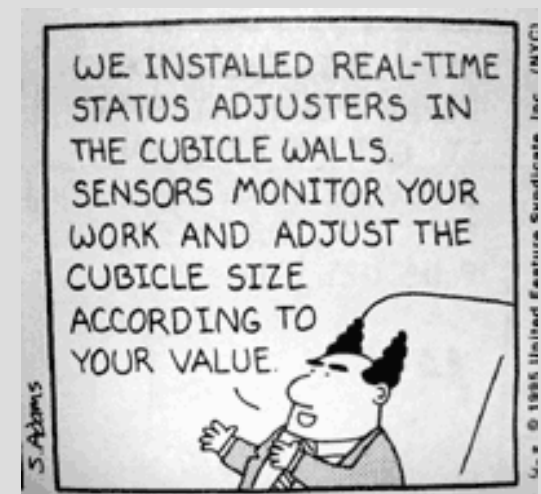
Who are the users/stakeholders ?

- 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 users (Eason, 1987)
 - Primary: frequent, hands-on
 - Secondary: occasional or via someone else
 - Tertiary: affected by it's introduction, or will affect it's purchase

Who are the stakeholders ?



Suppliers, local store owners
Customers
Checkout-operators
Managers and owners



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)



UVATT



- University of Victoria Assistive Technologies team (<http://web.uvic.ca/uvatt/>)
 - Students, faculty, staff design and develop technologies that can be used by people with disabilities special needs
 - Great opportunity if you are interested in fascinating ID research, volunteering, co-op
- Projects
 - Brain-wave communication
 - Tricycles for visually-impaired children
 - Automatic laptop opening device

What are needs ?

- Users rarely know what is possible
- Users can't tell you what they 'need' to help them achieve their goal – but they can describe their goals
- Instead look at existing tasks
 - Context
 - Information they require
 - Who collaborates to achieve the task ?
 - Why is the task achieved the way it is ?
- Envisioned tasks
 - Rooted in existing behavior
 - Described as future scenarios

Where do alternatives come from ?

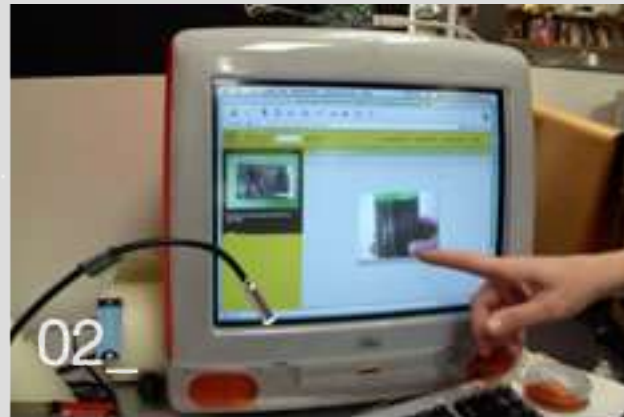
- Humans stick to what they know works
- But considering alternatives is important to 'break out of the box'
- Designers are trained to consider alternatives – software people generally are not
- How do you generate alternatives ?
 - 'Flair and creativity': research and synthesis
 - Seek inspiration: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

IDEO Tech Box

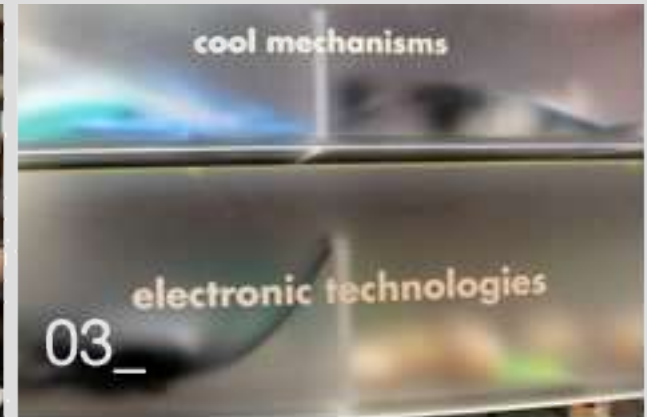
- Library, database, website - all in one
- www.ideo.com
- Contain physical gizmos for inspiration



01 The Tech Box is centrally located



02 An item on the intranet website



03 The drawers are sorted by categories

The TechBox



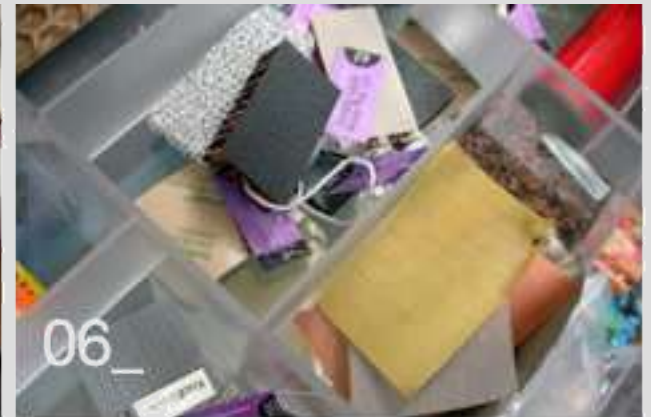
04_

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 demonstration units on top

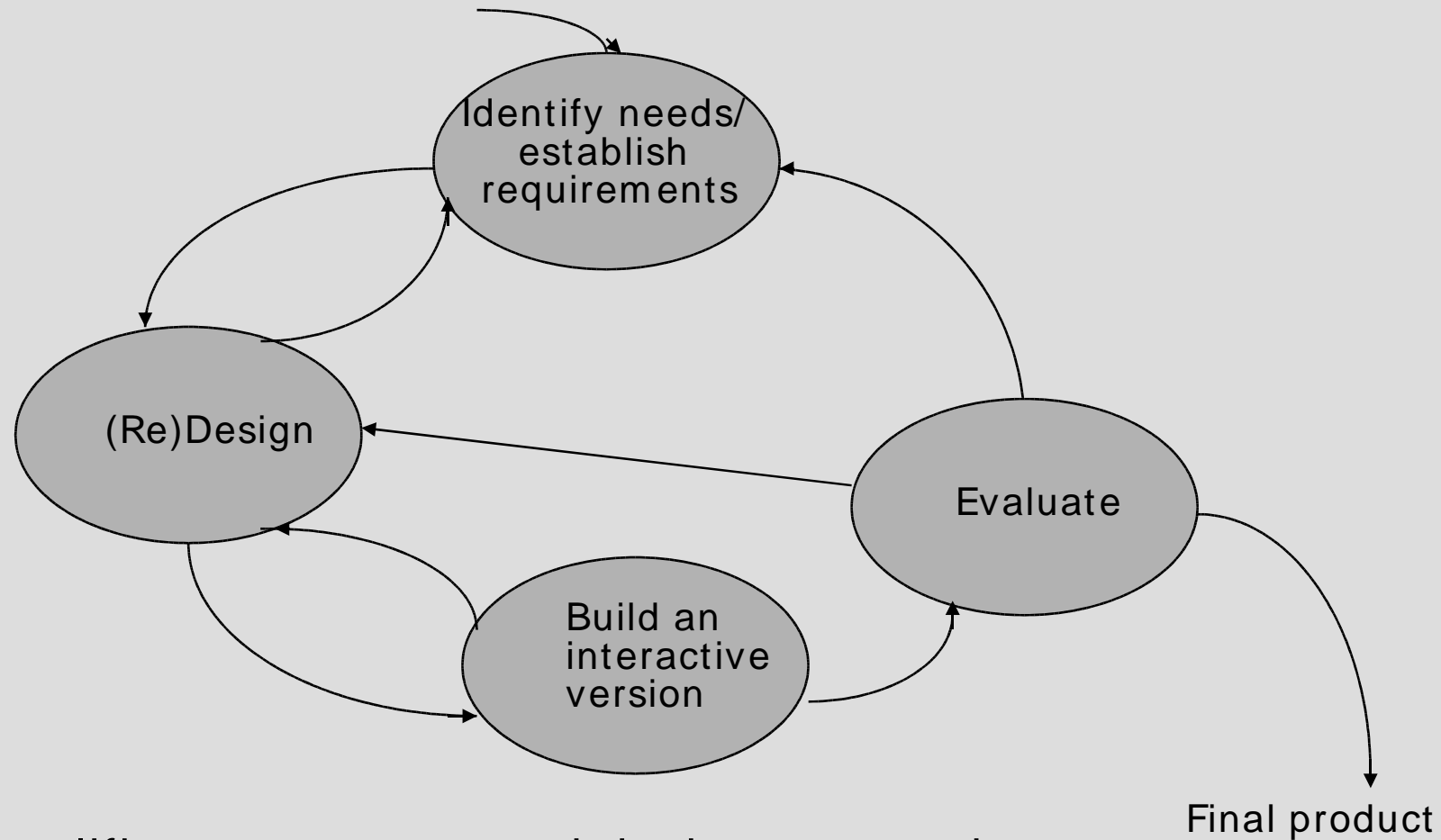
How do you choose among alternatives ?

- Evaluation with users or with peers e.g. Prototypes
- Technical feasibility – some not possible
- Quality thresholds: Usability goals lead to 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

Lifecycle models

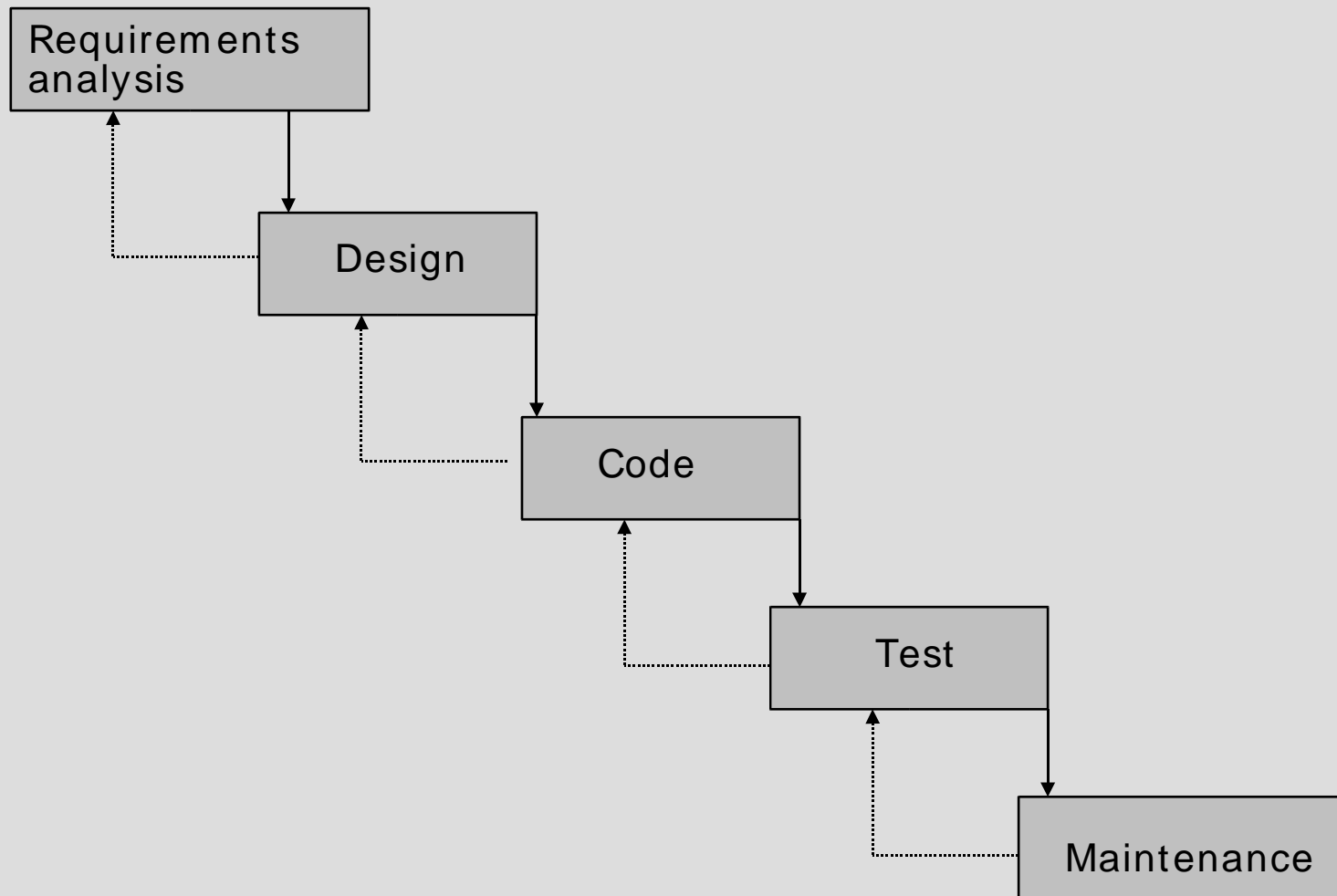
- Show how activities are related to each other
- Lifecycle models are:
 - Management tools
 - Simplified versions of reality
- Many lifecycle models exist, for example:
 - From software engineering: waterfall, spiral, JAD/RAD, Microsoft
 - From HCI: star, usability engineering

A simple interaction design model

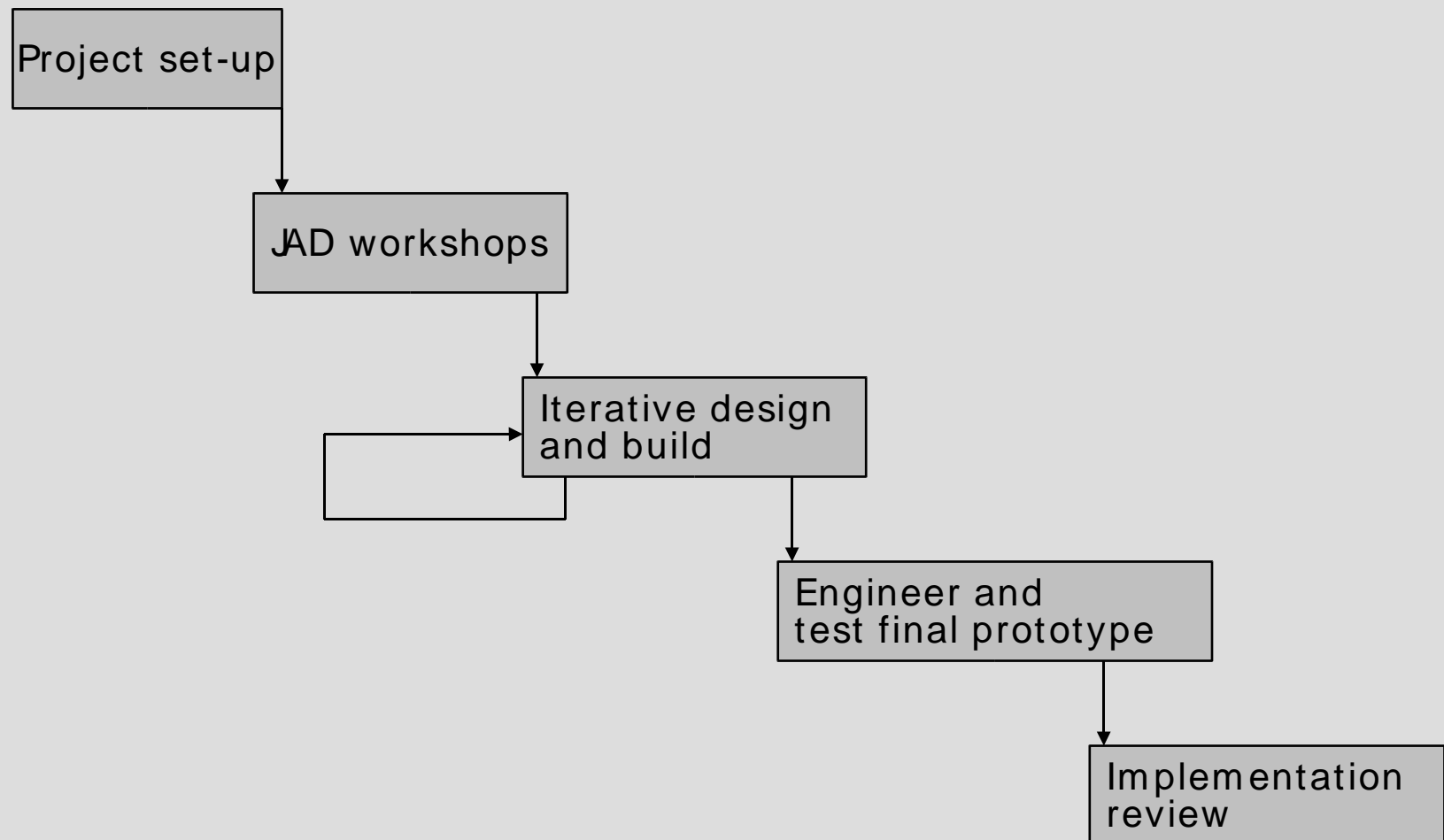


Exemplifies a user-centered design approach

Traditional waterfall model



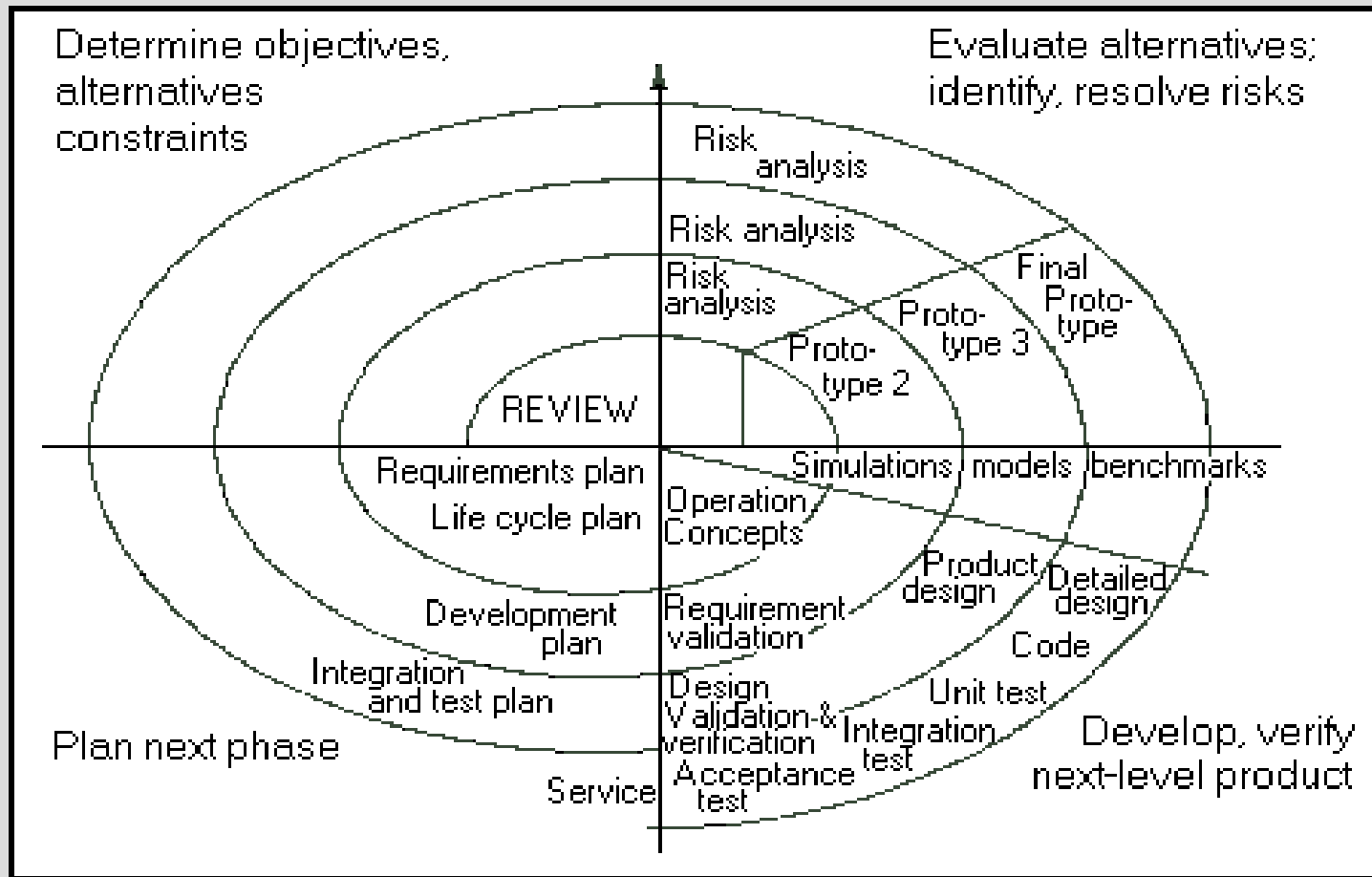
A Lifecycle for RAD (Rapid Application Development)



Spiral Model (Barry Boehm)

- Important features
 - Risk analysis
 - Prototyping
 - Iterative framework allowing ideas to be checked and evaluated
 - Explicitly encourages ideas to be considered
- Good for large and complex projects but not simple ones

Spiral Lifecycle Model



From ctr.umkc.edu/~kennethjuwng/spiral.htm

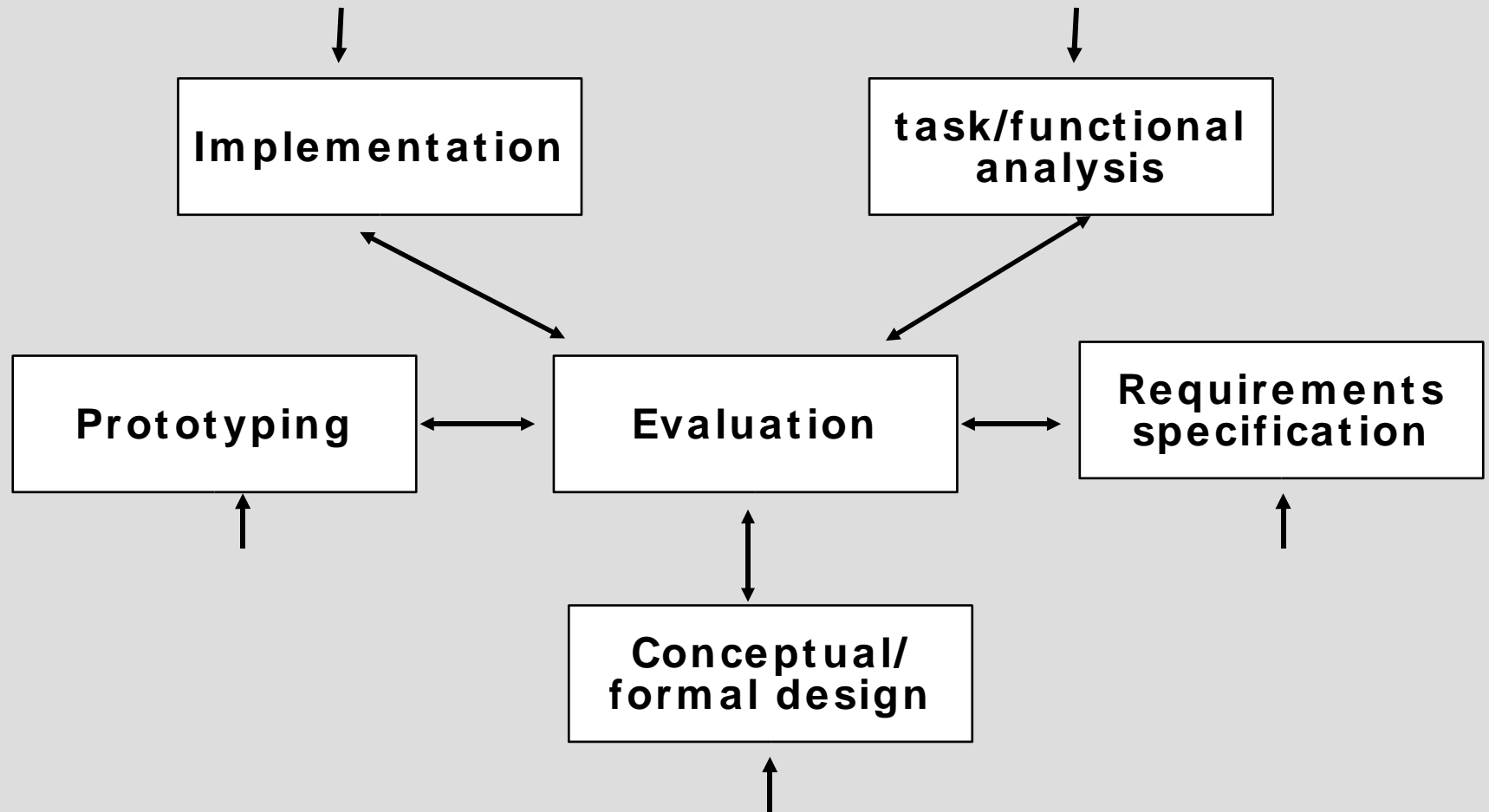
Based on the slides available at www.id-book.com

The Star Lifecycle Model

- Suggested by Hartson and Fix (1989)
- Important features
 - Evaluation at the core of activities
 - No particular ordering of activities.
Development may start in anyone
 - Derived from empirical studies of user 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
 - 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

Summary

- Four basic activities in the design process
 - Identify needs and establish requirements
 - Design potential solutions (re-design)
 - Choose between alternatives (evaluate)
 - Build the artefact
- These are permeated with three principles
 - Involve users early in the design and evaluation of the artefact
 - Define quantifiable & measurable usability criteria
 - Iteration is inevitable
- Lifecycle models show how these are related