User Interface Evaluation

Introduction

Lecture #15

Working Definition of HCI

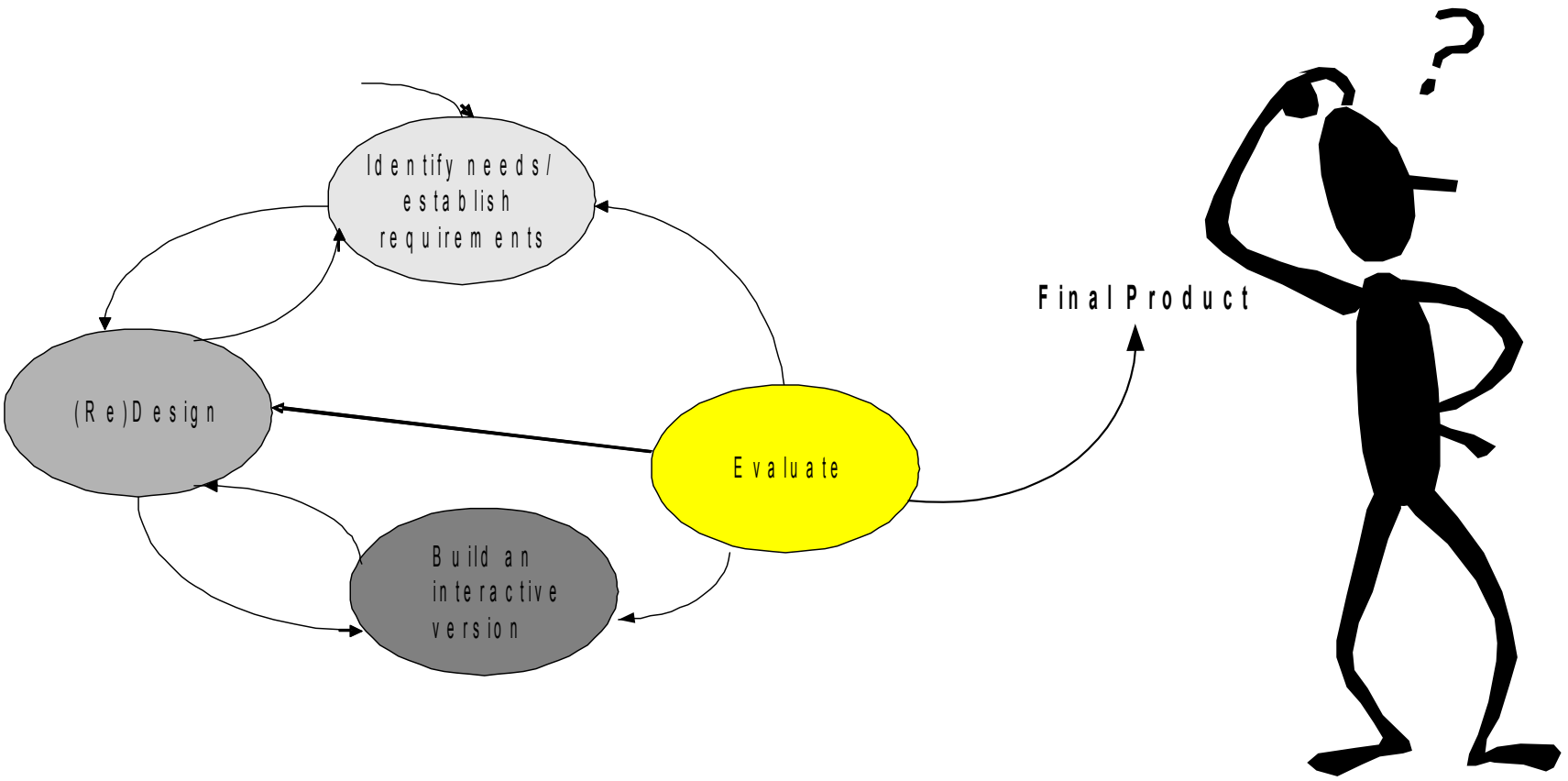
- Definition according to ACM SIGCHI

Human-computer interaction is a discipline concerned with the design, implementation and **evaluation** of interactive computing systems for human use and with the study of major phenomenon surrounding them

Agenda

- Introduction to HCI evaluation
- **Role** and **goals** of Evaluation
- Evaluation techniques

User-Centered Design Approach



What is Evaluation?

- Evaluation is concerned with gathering data about the usability of a design or product
  - by
    - a specified group of users (with experience, age, gender, psychological and physical characteristics)
  - for
    - the types of activities that the users will do (from tightly specified tasks to tasks decided by users)
  - within
    - a specified environment (from a controlled laboratory situation to a natural work setting)

Who? What?? Where??? When????

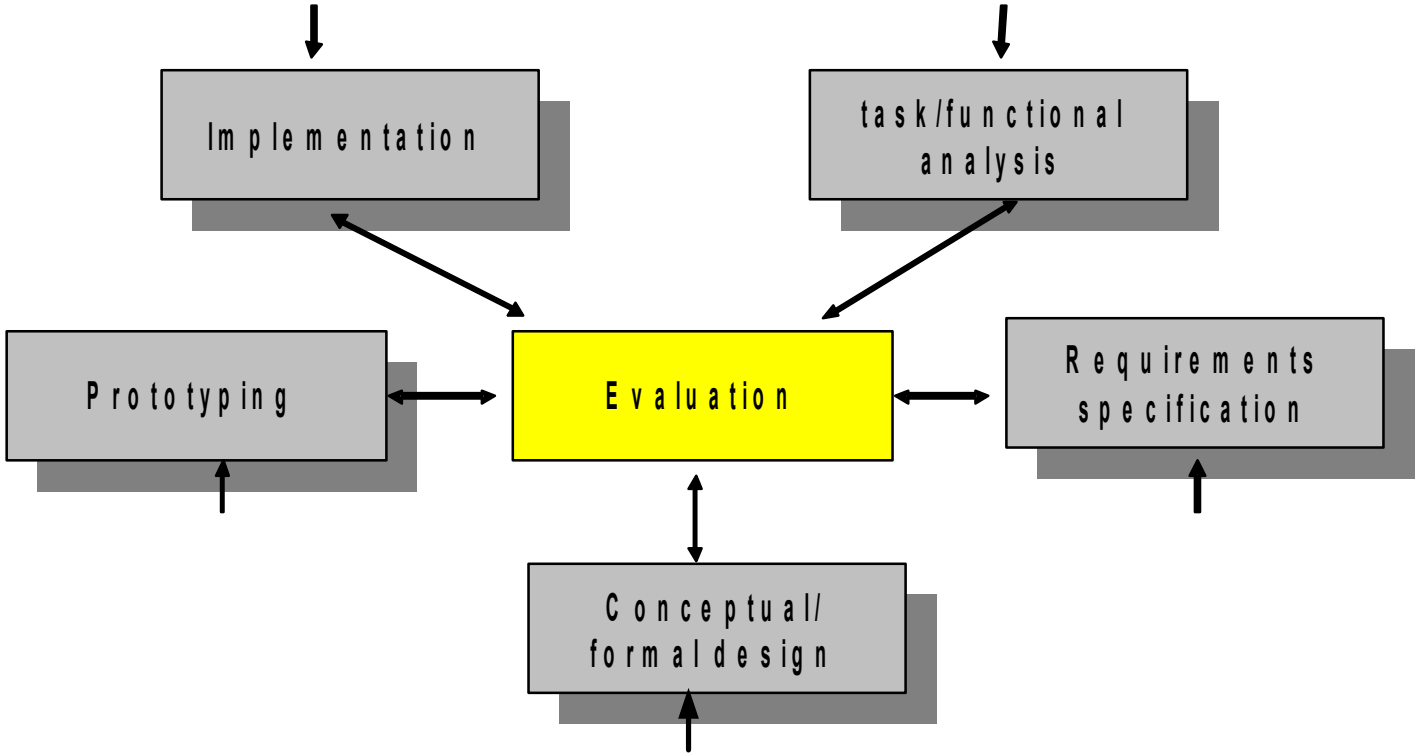
- **Formative evaluation** is done at different stages of development to check that the product meets users' needs

- **Summative evaluation** assesses the quality of a finished product

When????

- Evaluation should not be thought of as a single phase in the design process
- Evaluation should occurs throughout the design life cycle, with the results of the evaluation feeding back into modification to the design
- Star life cycle proposed by Hix and Hartson (1993)

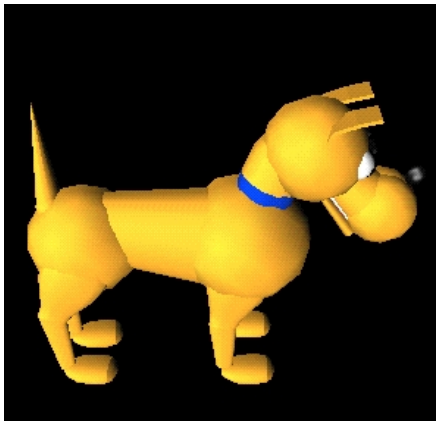
Star Life Cycle



- The nature of the artifacts being evaluated, which may be anything from series of sketches to a working software prototype or fully developed product

Evaluation in the Life Cycle

- **Formative evaluation**
  - During the early design stages evaluations tend to be done to:



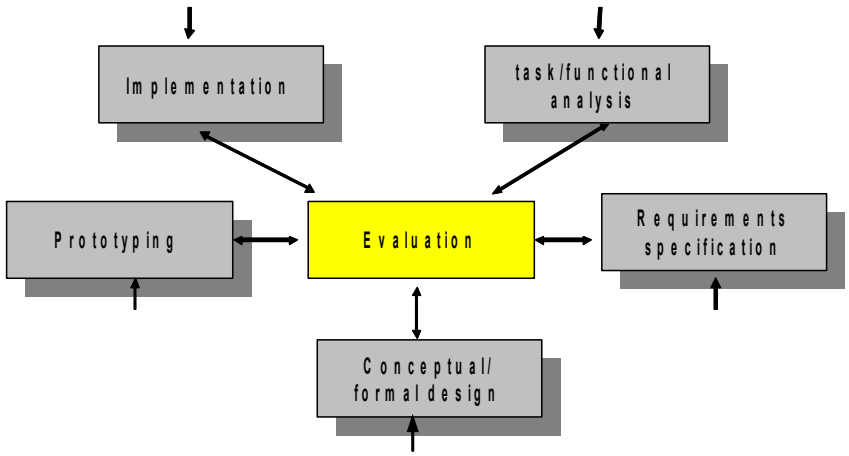
    - Predict the usability of the product or an aspect of it
    - Check the design team's understanding of user's requirements by seeing how an already existing system is being used in the field
    - Test out ideas quickly and informally

Evaluation in the Life Cycle

- **Summative evaluation**
  - Later on in the design process the focus shifts to:
    - Identifying user difficulties so that the product can be more friendly tuned to meet their needs
    - Improving an upgrade of the product

Star Life Cycle

- **Advantages**
  - This has the advantages that problems can be ironed out before considerable effort and resources have been expended on the implementation itself
  - It is much easier to change a design in the early stages of development than in the later stages



Role of Evaluation

- Evaluation is a central part of user-centered design approach
- Without doing some form of evaluation it is impossible to know whether or not the design or system fulfills the needs of the users
- Evaluation tells how well a system fits the physical, social and organizational context in which it will be used

Goals of Evaluation

- Four reasons (not limited to) for doing evaluation

1. **Engineering towards a target**
   - Is it good enough?
     - Design of the system should enable users to perform their intended tasks more easily
     - To assess the extent and accessibility of the system's functionality

2. **Understanding the world**
   - How do users employ the technology in the workplace?
     - To assess the user's experience of the interaction and its impact upon him

Goals of Evaluation

- Four main reasons for doing evaluation

3. Comparing design

- Which is the best?
  - To compare two or more designs or design ideas
  - With reference to number of functionalities and the usability of the design

4. Checking conformances to a standard

- Does the product conform to the standard?
  - It should satisfy some legal standard
  - Safety measures

In the World of Evaluation

What is evaluation?

Why do evaluation?

When do we do evaluation?

How do we do evaluation?

Evaluation Techniques

- There are several evaluation techniques
- All the techniques can be broadly classified into two categories
  - Evaluation through expert analysis
  - Evaluation through user participations

Taxonomy of Evaluation Techniques

- Evaluation through expert analysis

1. Cognitive walkthrough
2. Heuristic evaluation
3. Model-based evaluation
4. Review-based evaluation

Taxonomy of Evaluation Techniques

- Evaluation through user participations

1. Styles of evaluation
   - Laboratory studies
   - Field studies
2. Empirical methods
   - Hypothetical methods
   - Statistical methods
3. Observational techniques
   - Think-aloud and cooperative evaluation
   - Protocol analysis
4. Query techniques
   - Interviews
   - Questionnaires
5. Monitoring physiological responses

Recommended Materials

- My Home page

  http://www.iitkgp.ac.in/course/it60110/

  (For the presentation slides of the current lecture

- Book

  Human-Computer Interaction by Alan Dix et al. Pearson-Education,

  Chapter 9