System Analysis Design

Week-12-Lesson

Human Computer Interaction(HCI)

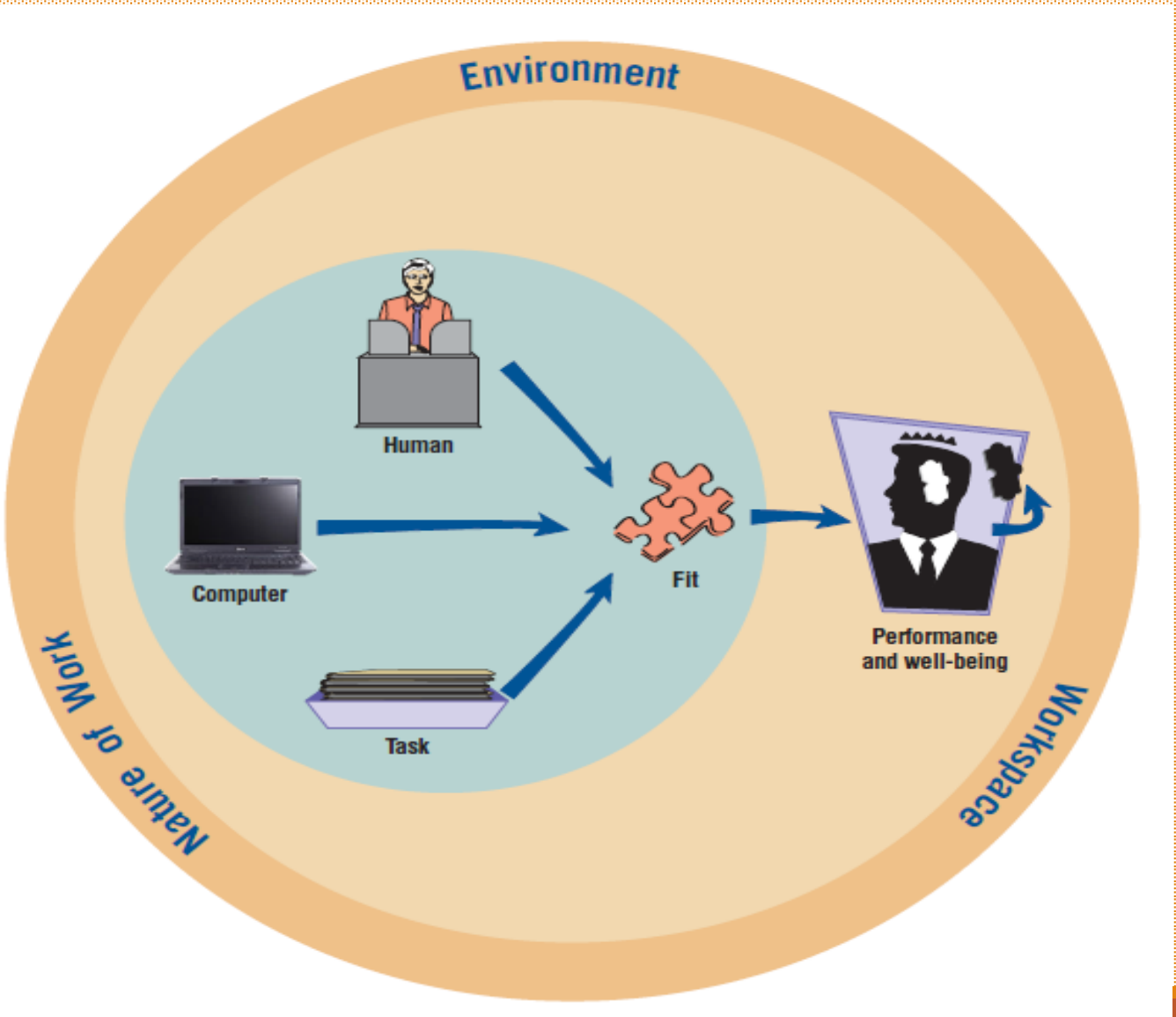
Daffodil International University

Why Should a Systems Analyst Know HCI?

- Designing for HCI means *"Ensuring system functionality and usability, providing effective user interaction support, and enhancing a pleasant user experience."*

The "fit" among the human, computer, and task affects performance and well-being.

- Fit
- Task
- Well-Being



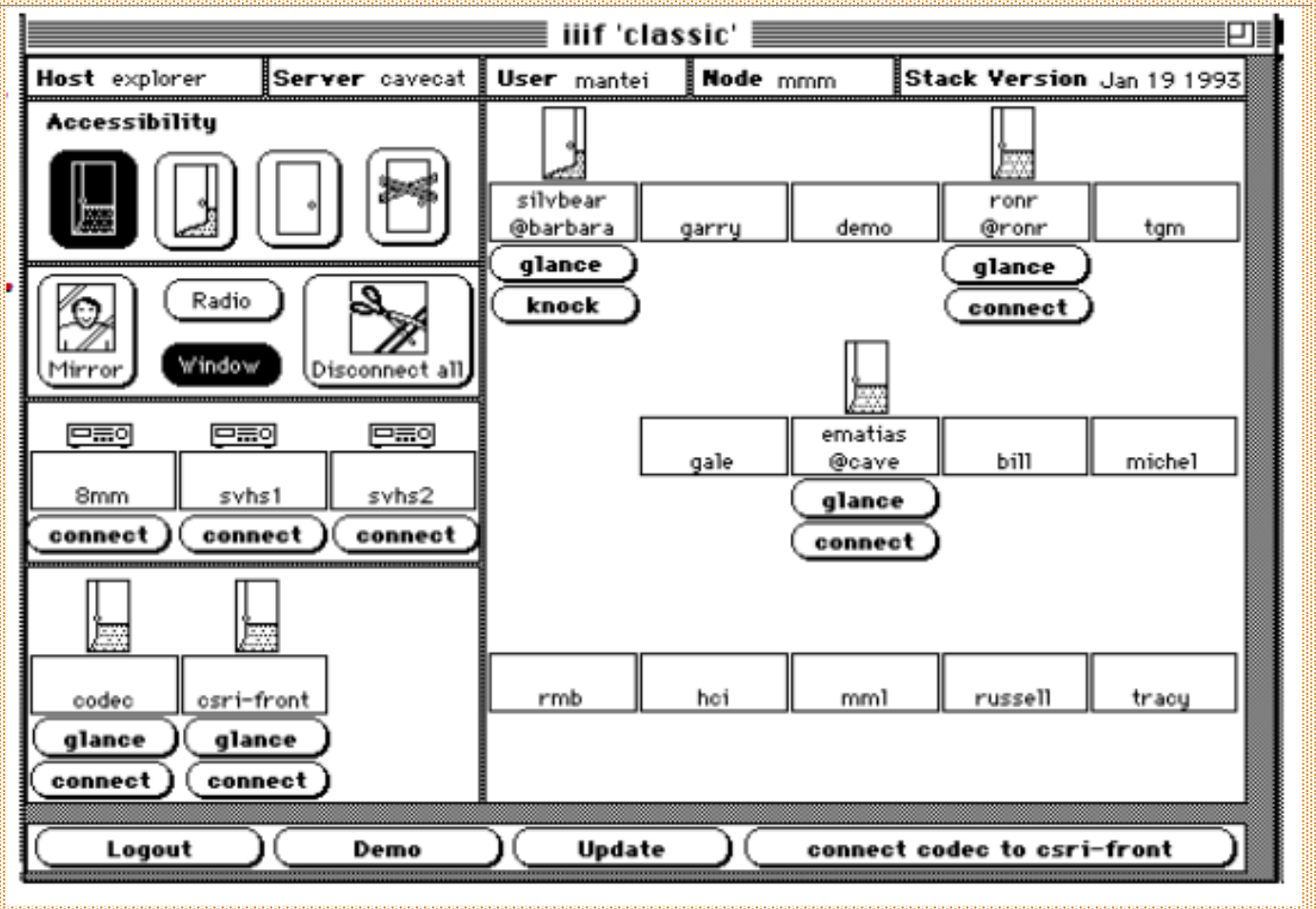
Why Should a Systems Analyst Know HCI?

- 40-60% of today's software consists of user interfaces.
- Such interfaces support high interactivity with the user, much end-user programming
- User interactivity is only going to get more complex: 3D graphics and virtual reality, augmented reality activities….
- Increase Productivity
- Reduced Training Cost

Why Are User Interfaces Poor?

- **Good user interfaces sell systems!**
  - Windows is a copy of the Macintosh interface;
  - The Mac interface is a copy of Bravo – developed by user interface researchers at Xerox PARC.
- **User interface capabilities and awareness help get contracts.**
- **Poor user interfaces can cripple a system that is outstanding in all other respects.**
- **Poor computer-driven interfaces placed in most mechanical products we know.**
  - Who can set the clock on their VCR?
  - Who can use photocopy, fax, candy, bank machine, cash register, telephone…;

What's Wrong with this Interface?



Guidelines for the HCI Approach to Systems Design

- Examine the task to be done and consider the fit among the human, computer, and task.
- Identify what obstacles exist for users in their attempts to accomplish their assigned tasks.
- Keep in mind the perceived usefulness and perceived ease of use from TAM.
- Consider usability. Examine the usage environment by creating use case scenarios that depict what is going on between users and the technology.
- Use the information you have gained beforehand to figure out the physical and organizational environmental characteristics. Design with prototyping to accommodate diverse users and users with disabilities.

Types of User Interface

- Natural-Language Interfaces
- Question-and-Answer Interfaces
- Menus
- Form-Fill Interfaces (Input/output Forms)
- Command-Language Interfaces(CLI)
- Voice User Interface(VCI)
- Graphical User Interfaces
- Other User Interface

Guidelines for Dialog Design

- Meaningful communication, so that the computer understands what people are entering and people understand what the computer is presenting or requesting.
- Minimal user action.
- Standard operation and consistency.

Minimal User Action

- Keying codes, such as airport codes when making a flight reservation, instead of whole words on entry screens.
- Entering only data that are not already stored on files.
- Supplying the editing characters
- Using default values for fields on entry screens
- Designing an inquiry (or change or delete) program so that the user needs to enter only the first few characters of a name or item description
- Providing keystrokes for selecting pull-down menu options
- Use radio buttons and drop-down lists to control displays of new Web pages or to change Web forms
- Provide cursor control for Web forms and other displays so that the cursor moves to the next field when the right number of characters has been entered

Feedback for User

- Acknowledging acceptance of input.
- Recognizing that input is in the correct form.
- Notifying that input is not in the correct form
- Acknowledging that a request is completed
- Notifying that a request was not completed
- Offering the user more detailed feedback

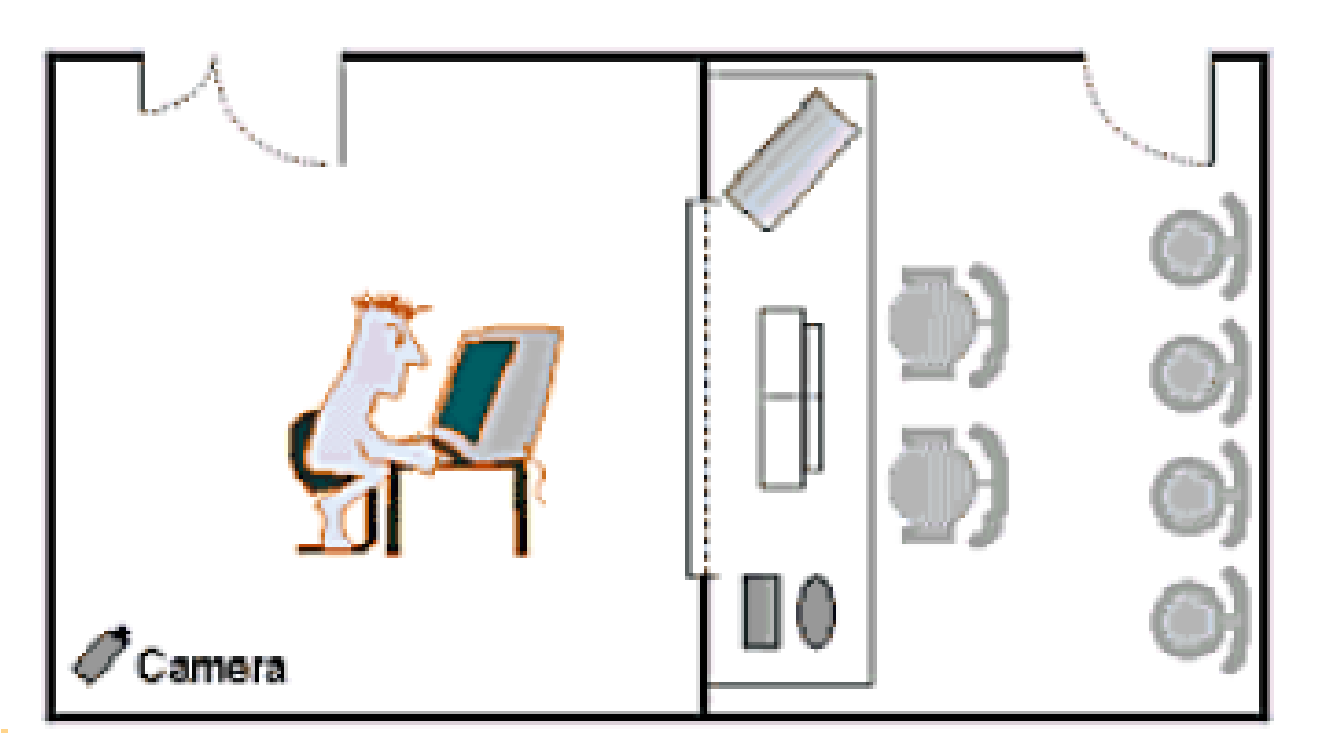
Easy Navigation for Ecommerce Web Sites

- Rollover menus
- Hierarchical links.
- Site map.
- Navigation bar
- Other navigation options

Evaluation Methods

- User Evaluation(users needed)
  - Experiment
  - Usability Testing
  - Ethnography
  - Survey
- Expert Evaluation(no users needed)
  - Heuristic Evaluation
  - Cognitive Walkthrough

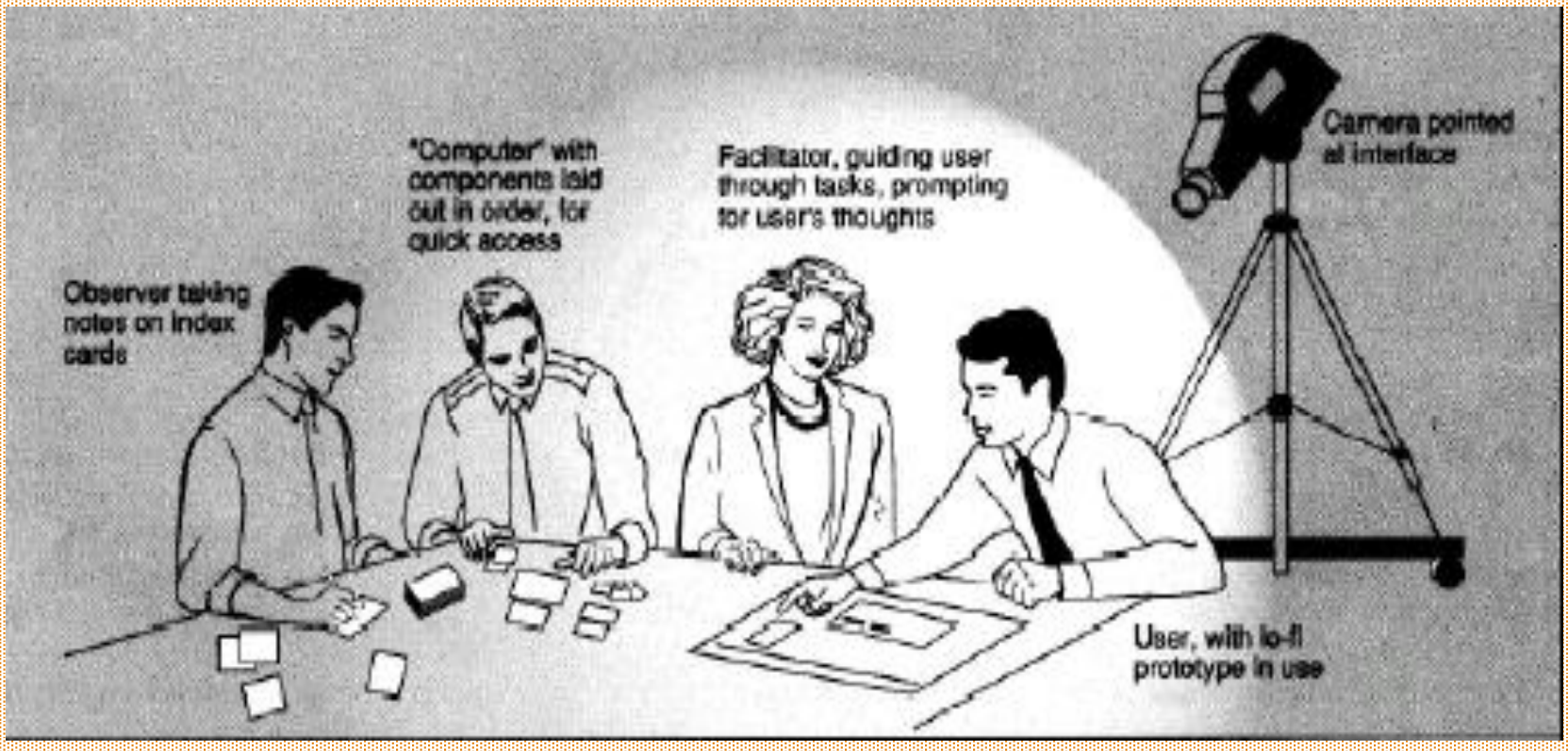
Experiment



Experiment

Prototyping for tiny fingers

Prototyping for tiny fingers

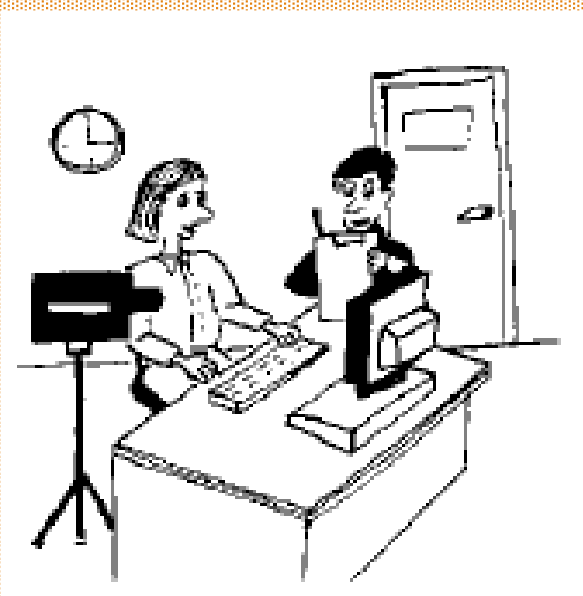


Think aloud

- A bit unnatural
- Misconceptions
- Demands training of the user
- Silence when hard

Planning a Test

- Who does what?
- Facilitator
- ”Computer”
- Log keeper
- What is to be said?
- Important to tell what is being tested. The system not the user!



Users

- Who?
- How many?
- Where?

Tasks

- Real
- Not instructions
- Independent

Keep a log

- Record?
- Write a report right after!

Debriefing

- What was good?
- What was bad?
- What did it feel like?

Attitude

- Try not to explain problems
- Accept all input as good

Survey

- Leading/value loaded questions
- The ”neutral” tends to take over

Expert Evaluation

- Expert on the users …
- … not the system!
- Not actual users
- Sometimes you have no choice
- Efficient
- Who is the user?
- What is he/she doing?

Heuristic Evaluation

- Budget or?
- Starting point in guidelines
- Not exactly as it is in the book

Neilson/Norman usability heuristics - the foundation for heuristic Evaluation

- Visibility of system status
- Match between system and real world
- User control and freedom
- Consistency and standards
- Help users recognize, diagnose, recover from errors
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help and documentation

Advantages of heuristic evaluation

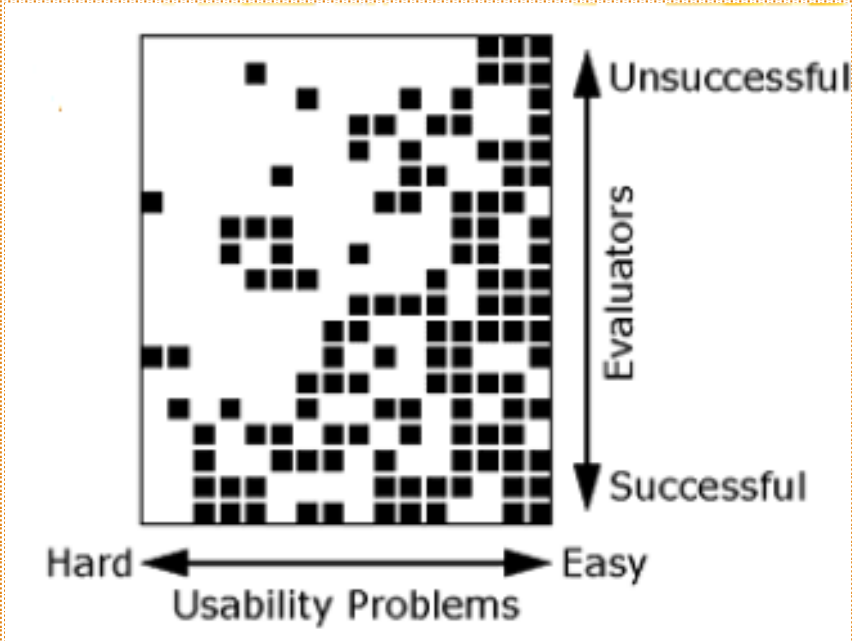
- Attention can be given to specific elements
- There are no ethical problems associated with inspection methods
- Usability problems are identified. These help determine how the overall experience is affected.

Disadvantages of Heuristic Evaluation

- The wrong set of heuristics chosen can lead to incorrect evaluation
- Time consuming as telling evaluators regarding what has to be done beforehand can take time.

One by one

- First separately
- Then join lists
- Not ”just” add just the lists



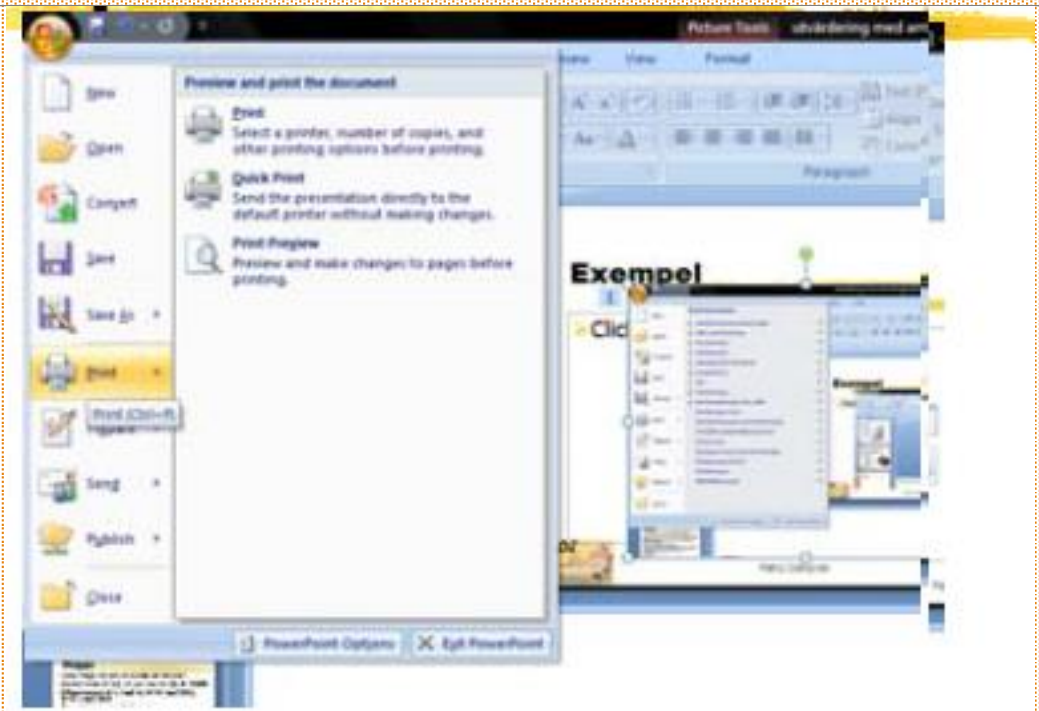
Cognitive Walkthrough

- A cognitive walkthrough is a structured approach to evaluating usability of a product.
- It involves the tester, who is not a user, asking four simple questions about the way a specific user journey is conducted.
- They will record the outcomes of these questions, in their opinion, and use these observations to improve the product further.

Cognitive Walkthrough

- Simulate a user with a task
- At EVERY step in the interaction
  - Does the user know what to do?
  - Does the user know how to do?
  - Will the user understand the
  - feedback from the system?

Example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Compiled Book, Patric Dahlqvist and Ulrika Norman