

HCI 1

1 Generations of computers

1. Vacuum tube (punchcards)
2. Transistor (assembler language)
3. Monitors, bytecode

2 HCI

Definition: HCI

The discipline concerned with the design, evaluation and implementation of interactive computer systems for human use and with the study of major phenomena surrounding them

Objectives of HCI are

- To provide an understanding of both the human user and the computer system, in an effort to make interactions between the two easier and more satisfying
- However the emphasis should always be on the user

User

- An individual user, a group of users working together or a sequence of users in an organisation dealing with some part of a process or task

Computer

- Technology ranging from desktop to large scale systems, or control/embedded systems

Interaction

- Communication between the user and computer in a direct or indirect manner

3 What is involved

- Study of humans using interfaces
- Development of new applications/systems to support user's activities
- Development of new devices and tools for users
- Develop usable products
 - Easy to learn
 - Effective to use
 - Provide an enjoyable/satisfying experience

4 Why should you be concerned with HCI

Increasingly becomes a matter of law

National health and safety standards constrain employers to provide their workforce with usable computer systems

EC directive 90/270/EEC - when designing, selecting, commissioning or modifying software

- Is suitable to task
- Is easy to use and adaptable to the user's knowledge and experience
- It provides feedback on performance
- It displays information in a format and at a pace that is adapted to the user
- It conforms to the "principle of software ergonomics"

Designers and employers cannot afford to ignore the user

5 Principles for supporting HCI

- Listening to what people want and getting them involved in design
- Using tried and tested user-based techniques during the design process
- Thinking through what might provide quality user experiences
- Considering what might help people with the way they currently do things
- Taking into account what people are good and bad at

6 Avoiding problematic design

Take into account

- Who the users are
- What activities are being carried out
- Where the interaction is taking place

7 Memory and mental models

7.1 Multi-store memory

Sensory memory

- Iconic, Echoic, Haptic
- Hold info for a few tenths
- Attention passes info to short term memory

Short term memory store

- Scratch pad for temporary recall of info
- Holds info for a few seconds (then decays)
- Has limited capacity 7 ± 2 digits for information
- Passed to long term memory via rehearsal

Permanent long-term memory store

- Everything we "know"
- Factual knowledge
- Experimental knowledge
- Procedural rules of behaviour etc.
- Hold information "indefinitely"
- Episodic - memory of events and experience in serial form
- Semantic - uses structure to store information derived from episodic memory list

7.2 Mental models

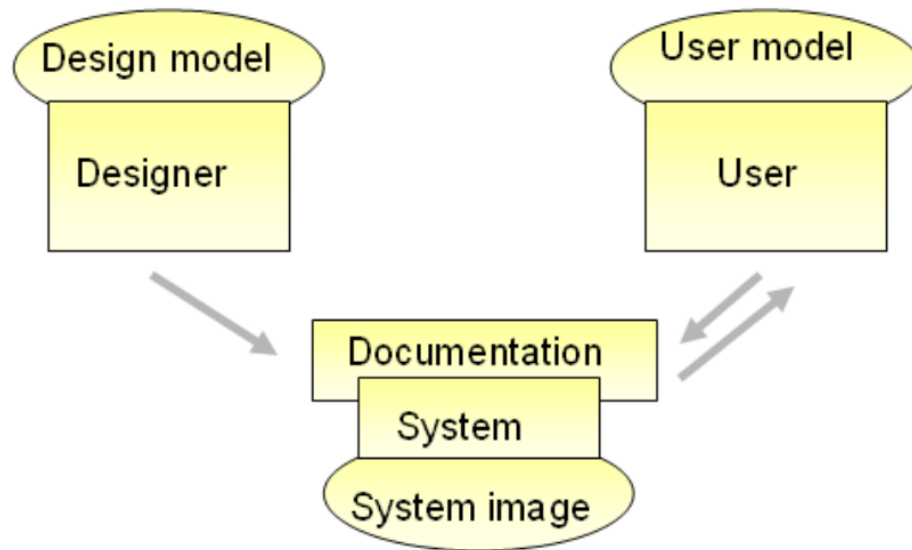
An explanation in what someone's thought process for how something works in the real world

A mental model is what the user believes about the system at hand

Knowledge is sometimes described as a mental model

- How to use the system (what to do next)
- What to do with unfamiliar systems or unexpected situations (how the system works)

People make inferences using mental models of how to carry out tasks



7.3 What to do in HCI design

Educate the user to build correct mental models

Transparency:

- Useful feedback in response to user input
- Easy to understand and intuitive ways of interacting with the system
- Provide the right kind and level of info in the form of:
 - Clear and easy to follow instructions
 - Appropriate online help and tutorials
 - Context sensitive guidance for users, set at their level of experience

8 HCI, science or craft?

Both - artistically pleasing and capable of fulfilling the tasks required