

# PENDAHULUAN

Ruang Lingkup  
Mengapa dan Apa  
Siapa Saja yang Terlibat  
Konsep dan Dasar  
Sejarah dan Paradigma IMK

## Course Overview

- Human abilities
- Evaluation (without users)
- Design
- Dialog & interaction
- Evaluation (with users)
- Special topics
  - CSCW, InfoVis, Ubicomp, Agents

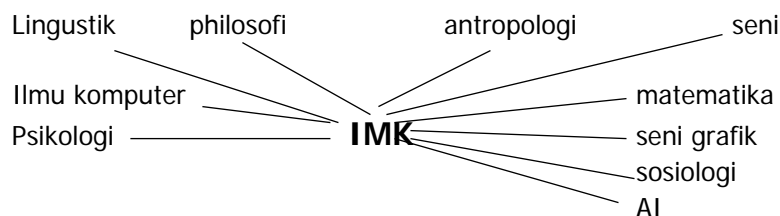
## HCI = Interaksi Manusia & Komputer



- What is it?
  - Can you define/describe it?
  - Human Computer Interaction (HCI = IMK) merupakan studi tentang interaksi antara manusia, komputer dan tugas/ task.
  - Bagaimana manusia dan komputer secara interaktif melaksanakan dan menyelesaikan tugas/ task dan bagaimana sistem yang interaktif itu dibuat.

## Why We Are Here

- Look at human factors that affect software design and development
- Central Topic: User interface design
  - Not just a software interface on a desktop monitor!
- IMK berasal dari berbagai disiplin bidang ilmu, teknik dan kesenian.



## Yang Terlibat Dalam IMK

- Psikologi dan ilmu kognitif : persepsi user, kognitif, kemampuan memecahkan masalah
- Ergonomi : kemampuan fisik user
- Sosiologi : kemampuan memahami konsep interaksi
- Ilmu komputer dan teknik : membuat teknologi
- Bisnis : pemasaran
- Desain grafis : presentasi interface
- Dan lain-lain.

## HCI

- What happens when a human and a computer get together to perform a task
  - task - write document, calculate budget, solve equation, learn about Bosnia, drive home,...

### **Why Is This Important ?**

- 1. Computers (in one way or another) now affect every person in society
  - Increasing % utilize computers in work
- 2. Product success may depend on ease of use, not necessarily power

## Apa Interaksi Manusia dan Komputer (Human Computer Interaction) ?

- **IMK meliputi ergonomi dan faktor manusia.**

Ergonomi	UK	} =
Faktor manusia	USA	
- Secara tradisional, ergonomi memfokuskan pada karakteristik fisik mesin dan sistem dan melihat unjuk kerja (performance) dari user.
- Faktor manusia merupakan studi tentang manusia dan tingkah lakunya dalam menggunakan mesin, alat-alat teknologi dalam menyelesaikan tugas.
- Interaksi manusia – mesin + informasi dan teknologi = interaksi manusia dan komputer

## Course Aims and Goals

- 1. Consciousness raising
  - Make you aware of these issues
- 2. Design critic
  - Question bad design
- Allow users to carry out tasks
  - Safely
  - Effectively
  - Efficiently
  - Enjoyably



## Usability

- Important issue
- Combination of
  - Ease of learning
  - High speed of user task performance
  - Low user error rate
  - Subjective user satisfaction
  - User retention over time

## Two Crucial Errors

- Assume all users are alike
- Assume all users are like the designer

## How do we improve interfaces?

1. Change attitude of software professional
2. Draw upon fast accumulating body of knowledge regarding H-C interface design
3. Integrate UI design methods & techniques into standard software development methodologies now in place

## Improving Interfaces

- Know the User!
  - Physical abilities
  - Cognitive abilities
  - Personality differences
  - Skill differences
  - Cultural diversity
  - Motivation
  - Special needs

## Paradigms

- Predominant theoretical frameworks or scientific world views
  - e.g., Aristotelian, Newtonian, Einsteinian (relativistic) paradigms in physics
- Understanding HCI history is largely about understanding a series of paradigm shifts
  - Not all coming on next slides are really “paradigm” shifts, but you get the idea

## Paradigm Shifts

- Cards,tape -> VDU
- Mainframe -> PC
- Glass tty -> WIMP interface
- Commands -> Direct manipulation
- Direct manipulation -> Agents
- Visual -> Multimedia
- Linear -> Web-like
- Desktop -> Ubiquitous, Mobile
- Single user -> CSCW
- Purposeful use -> Situated use

## History of HCI

- Digital computer grounded in ideas from 1700's & 1800's
- Technology became available in the 1940's and 1950's

## Vannevar Bush

- "As We May Think" - 1945 *Atlantic Monthly*

"...publication has been extended far beyond our present ability to make real use of the record."

## Bush

- Postulated **Memex** device
  - Can store all records/articles/communications
  - Large memory
  - Items retrieved by indexing, keywords, cross references
  - Can make a trail of links through material
  - etc.
- Envisioned as microfilm, not computer

## J.R. Licklider

- 1960 - Postulated "man-computer symbiosis"
- Couple human brains and computing machines tightly to revolutionize information handling



## Vision/Goals

### Immed

- Time sharing
- Electronic I/O
- Interactive, real-time system
- Large scale information storage and retrieval

### Intermed

- Combined speech recognition, character recognition, light-pen editing

### Long-term

- Natural language understanding
- Speech recognition of arbitrary users
- Heuristic programming

- Computers too expensive for individuals timesharing
  - increased accessibility
  - interactive systems, not jobs
  - text processing, editing
  - email, shared file system

Mid 60's

->

Need  
for  
HCI



## Ivan Sutherland

- **SketchPad** - '63 PhD thesis at MIT
  - Hierarchy - pictures & subpictures
  - Master picture with instances (ie, OOP)
  - Constraints
  - Icons
  - Copying
  - Light pen as input device
  - Recursive operations



## Douglas Engelbart

Inventor  
of mouse



- Landmark system/demo:
  - hierarchical hypertext, multimedia, mouse, high-res display, windows, shared files, electronic messaging, CSCW, teleconferencing, ...

## Alan Kay

- Dynabook - Notebook sized computer loaded with multimedia and can store everything

Personal  
computing



Desktop  
interface

## Video Display Units

- More suitable medium than paper
- Sutherland's Sketchpad as landmark system
- Computers used for visualizing and manipulating data

## Personal Computing

- System is more powerful if it's easier to use
- Small, powerful machines dedicated to individual
- Importance of networks and time-sharing
- Kay's Dynabook, IBM PC

## Personal Computers

- '70's IBM PC
  - Text and command-based
  - Sold lots

PCs with GUIs, Xerox Star - '81, Star, Apple Lisa - '82, Apple Macintosh - '84

## WIMP

- **W**indows, **I**cons, **M**enus, **P**ointers
- Can do several things simultaneously
- Familiar GUI interface
- Xerox Alto, Star; early Apples

## Metaphor

- All use is problem-solving or learning to some extent
- Relating computing to real-world activity is effective learning mechanism
  - File management on office desktop
  - Financial analysis as spreadsheets

## Direct Manipulation

- Coins and explores notion of direct manipulation of interface
- Long-time Director of HCI Lab at Maryland
- '82 Shneiderman describes appeal of graphically-based interaction
  - object visibility
  - incremental action and rapid feedback
  - reversibility encourages exploration
  - replace language with action
  - syntactic correctness of all actions
- WYSIWYG, Apple Mac



## Multimodality

- Mode is a human communication channel
  - Not just the senses, e.g., speech and non-speech audio are two modes
- Emphasis on simultaneous use of multiple channels for I/O

## Hypertext – Ted Nelson

- Computers can help people, not just business
- Coined term “hypertext”
- Think of information not as linear flow but as interconnected nodes
- Bush’s MEMEX, Nelson’s hypertext
- Non-linear browsing structure
- WWW ‘93



## Nicholas Negroponte

- MIT machine architecture & AI group ‘69-‘80s
- Ideas:
  - wall-sized displays, video disks, AI in interfaces (agents), speech recognition, multimedia with hypertext



## Mark Weiser

- Introduced notion of “calm technology”
  - It’s everywhere, but recedes quietly into background
- CTO of Xerox PARC



## Language (Agents)

- Actions do not always speak louder than words
- Interface as mediator or agent
- Language paradigm

## C S C W

- Computer-Supported Cooperative Work
- No longer single user/single system
- Micro-social aspects are crucial
- E-mail as prominent success but other groupware still not widely used

## Ubiquity

- Person is no longer user of virtual device but occupant of virtual, computationally-rich environment
- Can no longer neglect macro-social aspects
- Late '90s - PDAs, VEs, ...