

Chapter 1

Human Computer Interaction with Wearables

Recap

Slide Input Devices:

- Text Entry: Keyboards, Chording, Voice
- Pointing, Selection, Gesture

1.1 Human Computer Interaction

Slide Human Computer Interaction:

- Research Topic: Understand Human Computer Interaction
 - Engineering Topic: Build interactive systems
 - “Cognitive” Ergonomics: Physiology, Psychology (and Sociology)
 - Business impact: HCI design important for product success
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1.1.1 History

Slide HCI History and People:

Ivan Sutherland “Sketchpad: A Man-Machine Graphical Communications System” First GUI, light pen device, 1963

Doug Englebart Mouse

Ted Nelson Hypertext, 1970

Alan Kay Smalltalk: OO-Programming language + operating system + user interface

1982- GUI Systems: Xerox Star, Apple Lisa, Apple Macintosh

1985 Windows (birthday 20.11.1985, yesterday!)

Slide MS Windows 1.0:



Image from heise.de website

Slide MS Windows 1.0 screenshot:

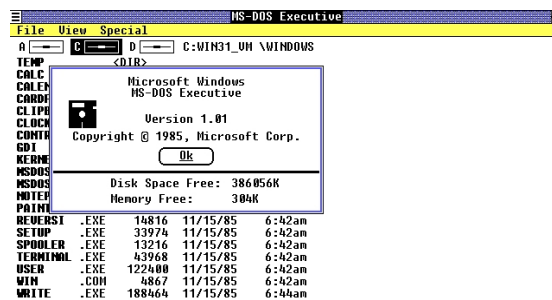


Image from heise.de website

1.1.2 Structure of HCI

Slide What HCI is about...:

- People
 - Activities
 - Contexts
 - Technologies
-

Slide People:

- Physical Differences
 - Psychological Differences
 - Usage Differences
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Physical Differences:

Weight, Height, senses

example: color blindness

2.8 mio Wheelchair users in Europe

Fingers large, buttons small

Growing age of population

Psychological differences:

good spatial ability: people remember structure of websites

Language differences

cultural differences: cross and tick in excel

difference in mental models

Usage differences:

experts vs non-experts

discretionary users: only using once in a while

homogenous vs heterogenous user groups

Slide Activities:

- Temporal Aspects
 - Cooperation
 - Complexity
 - Safety-Critical
 - Content
-

Temporal aspects:

1: regular or infrequent

2: time pressure, peaks

3: Uninterrupted vs interrupted

4: Response time of the system

Cooperation:

5: Alone or working with others

Complexity:

6: Well-defined vs. vague

Safety-Critical:

7: injury or accident

8: design for errors

Context:

9: data requirements: data entry: keyboard needed, barcode scanner for library?

10: media needed? binary numerical display vs full-framerate multimedia

Slide Context:

- Physical Environment
- Social Context
- Organizational Context

Slide Technology:

- Input
 - Output
 - Communication
 - Content
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Slide PACT Framework:

- PACT Analysis
 - Development of personas
 - Example: Sales Clerk
 - Example: Technical Inspector
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1.1.3 Principles and Practice

Slide Principles and Practice:

- Accessibility
 - Usability
 - Acceptability
 - Engagement
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Accessibility: Do not exclude users

Usability:

Acceptability:

Engagement:

Slide Accessibility:

- Don't Exclude Users!
- Physically
- Conceptually
- Economically
- Cultural Exclusion
- Social Exclusion

Physically excluding: Wrong placement, devices too big/too small

Conceptually excluding: People cannot understand instructions, no mental model

Economically excluding: No money

Cultural Exclusion: Using soccer metaphor excludes people that don't know soccer (try with cricket) (or quiddich)

Social Exclusion: Unavailable at a certain time, only for member of social group etc...

Slide Usability:

- efficient
- effective
- easy to learn
- safe to operate
- high utility

efficient: using appropriate effort

effective: contains appropriate functions and information, organized in an effective way

easy to learn:

safe to operate: in all circumstances

utility: does the things that people want to get done

Slide Acceptability:

- Legal
 - Political
 - Convenience
 - Cultural and social habits
 - Usefulness
 - Economic
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Political: do people trust it? does it threaten people?

Convenience: don't force people to do things they don't want

Cultural: rude to disturb people: spam and spim

Usefulness: PDA diary usable but not useful

Economic: business case?

Slide Engagement:

- Is it a "Killer App"?
 - Identity
 - Adaptivity
 - Narrative
 - Immersion
 - Flow
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Identity: authenticity, first-mover

Adaptivity: long-lasting, many experiences: musical instruments

Narrative: Telling a good story

Immersion: Being fully involved like in a good book

Flow: application of practical abilities to challenges just manageable

Summary

Slide Summary:

- PACT: People, Actions, Context, Techonology
 - Design Principles
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